





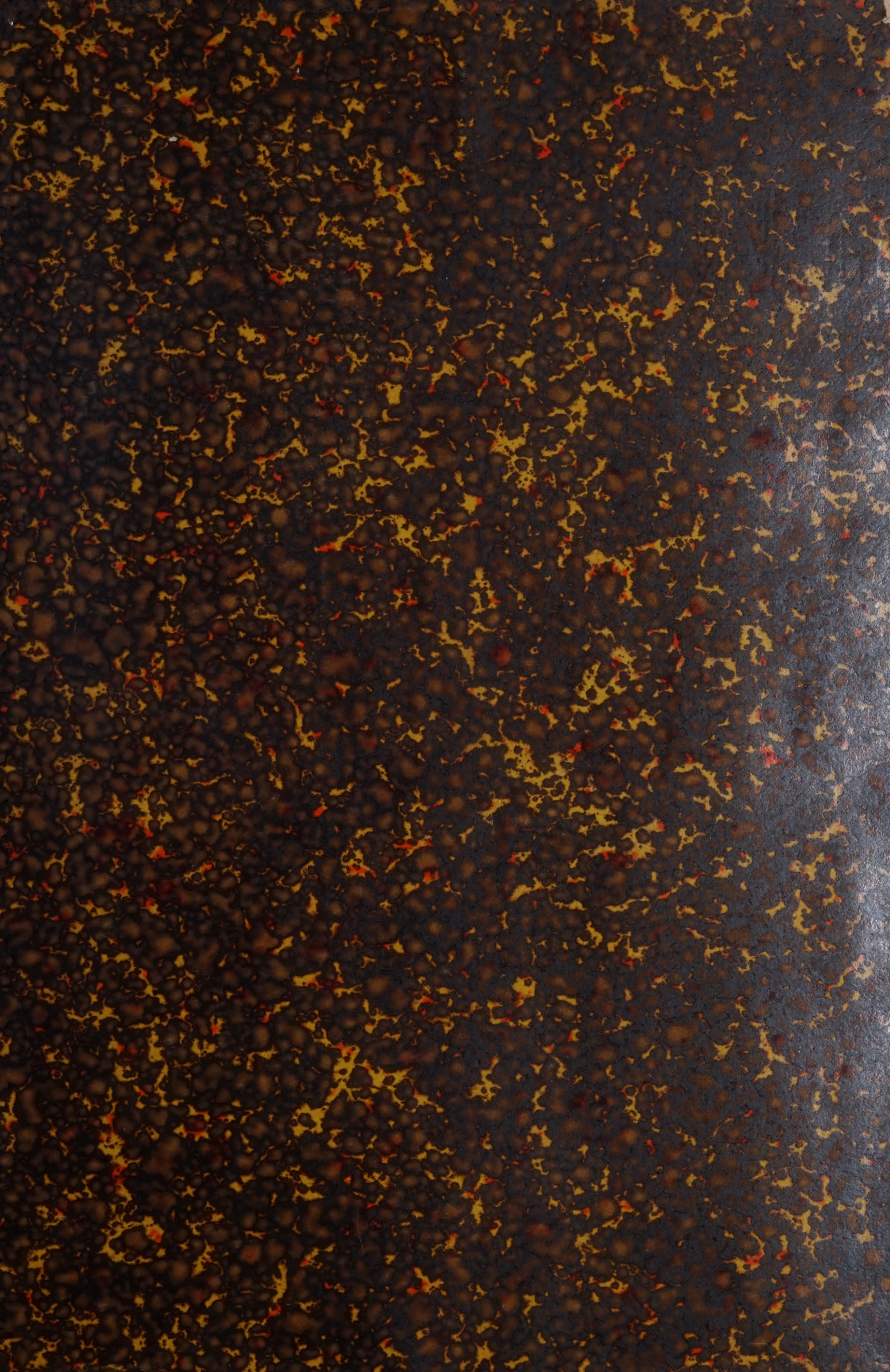
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THE  
ARCHITECT  
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Contract Reporter.  
A WEEKLY  
ILLUSTRATED JOURNAL  
OF  
ART,  
CIVIL ENGINEERING,  
AND  
BUILDING.

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*Architects may look with a proud confidence into the future, for they practise an art raised on an immovable basis of science, clothing itself in forms of abstract beauty, enriched by the co-operation of sculpture, and made yet lovelier, when it chooses, by the charm of colour.*—LORD LEIGHTON.

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# THE ARCHITECT AND CONTRACT REPORTER. A JOURNAL OF ART, CIVIL ENGINEERING & BUILDING.

## THE WEEK.

THE attempt to discover the Ark of the Covenant within the Hill of Tara, which has caused some amazement during the past week, is not novel. Excavations have been commenced on former occasions, but as they were never allowed to be completed the explorers remained unsatisfied. So much has been said and written for many centuries by imaginative people concerning Tara, we need not wonder if religious enthusiasts, who are always on the look-out for material confirmation of biblical truths, should have concluded that the hill was made the depository of a sacred treasure. When we find Mr. WYNDHAM, the Irish Secretary, allowing the Irish strain in his blood to get the better of him, and to say that the present features of the ground precisely conform to ancient accounts of the regal buildings that once stood on the Hill of Tara, it was pardonable in TOM MOORE to chant about Tara's halls and the chiefs and ladies bright who dwelt in them; but a Secretary of State should be more circumspect. Mr. WYNDHAM could easily have ascertained that the only regal buildings at Tara were no more than mud banks. Tara is but one of the countless primitive earthworks which are scattered over Ireland. The mounds are scheduled under the Ancient Monuments Act, but that enactment is one of those through which, as Irish lawyers say, a coach and six can be easily driven. The owner and lessee have been persuaded to put an end to the excavations for the present, or at least to wait until the Royal Society of Antiquaries of Ireland have made experiments in digging. It may be safely concluded that no ancient ark will ever be unearthed. The Coronation-stone which was believed to have been used at Tara was for a long time accepted as having served for a pillow for the Patriarch JACOB, but geology has demonstrated that the stone does not belong to any strata found in Palestine, and the worthlessness of tradition in one case should be enough to induce pious folks to be incredulous about similar myths.

AMONG German buildings there is not one which appeals more strongly to people in all parts of the Empire than the castle of Heidelberg. This is proved by the number of verses which have been composed in praise of the ruins. At the present time the castle gains a new interest, for it is a memorial of what Frenchmen can do as invaders in making war against buildings as well as against men. It forms, too, an element in one of the most beautiful of landscapes, for the red sandstone walls when viewed from the opposite bank of the Neckar make an impression which can never be forgotten by the stranger. The problem of restoration is exceptionally difficult in Heidelberg. Some enthusiasts would not allow the slightest alteration to be effected, but a part of the buildings is unroofed, and from the exposed condition the sandstone suffers from wind and rain. On the other hand, more practical admirers admit the necessity of repairs, but when scaffolding is erected for the purpose they look on the building as outraged. The Grand Duke of BADEN has been lately besought to take measures to prevent further decay, but it has been announced officially that everything has been done, or is in contemplation, which prudence

dictates. The first question really is to roof or not to roof? And there are numerous opponents of either course. The great interest in the building is realised by the Government, and we think they are right in proceeding slowly with restoration. The castle is one of those buildings which should be surrounded with a colossal glass case, but would the pilgrims for whom an almost perpendicular railway has had to be constructed tolerate that kind of protection?

MONDAY last was the day fixed for the reception of designs for the proposed Liverpool Cathedral. As it was believed that some designs which were on their way were not delivered, the building committee extended the time until Wednesday. Owing to the magnitude of the work it was thought by many experts that only a limited number of architects would undertake the risk of preparing designs. But a great many cases have been received not only from various parts of Great Britain but from the colonies also. The Americans likewise, it is said, have contributed designs, and some have arrived from continental cities. On Monday next the committee will consult with their advisers about the examination of the designs, a process which it is anticipated will not be finished for several months. The cathedral committee have purchased the reversion of the leasehold house properties on the Mount for 1,300*l.*, and the remainder of the land, comprising St. James's Mount Gardens, for 10,000*l.*, subject to a proviso that so much of the land as may not be required for the site of the cathedral shall be retained as "public walks," and that so much of it as may not be required for building operations shall be left to the use of the public whilst the cathedral is building.

SEVERAL English explorers have before now taken an interest in ancient Ephesus. POCOCKE prepared a plan of the city which proved that the walls were about four miles in circuit. They were roughly built, but cased with cut stone and defended by towers. The Dilettanti Society's work, "The Antiquities of Iona," contains views and plans of many of the buildings, including the gymnasium, the circus, temples, &c. It will be remembered that the city possessed the great temple which HEROSTRATUS set in flames in order to secure a record of his name with remote posterity. The Archæological Institute of Vienna have of late years made Ephesus the scene of operations. Their representative, Professor BENNDORFF, has purchased a large tract of ground near the harbour for the purpose of excavations. By means of the last season's excavations the remains of the theatre are now open to view. The unearthing of some streets which belonged to Roman Ephesus has also been accomplished, and evidence is forthcoming that in the fourth century of our era there was a systematic lighting of the thoroughfares of that part of the city. Numerous new inscriptions in Greek have been obtained. In the excavations which are about to be resumed it is anticipated that ruins of private houses will become visible. It is considered that the results justify the outlay, and Vienna will be enriched by some remarkable works, which will be more impressive than any of the examples of sculpture which have been hitherto derived from Ephesus.





PAINTER'S ARCHITECTURE: PALMA VECCHIO.

## HEREFORD CATHEDRAL.\*

STONES have been described as "crying out" and "rising in mutiny." Expressions are allowable which impart life to materials that are so closely associated with men. Why should not a building be accepted as "a thing of life" as well as a ship? If stones were endowed with voices, complaints from many old English churches would be heard throughout the land. Hardly one of them has escaped suffering. At one time it would be no exaggeration to compare them to organic beings; but the character which gave them the unity and subordination of parts to a definite purpose which mark all living things has been mutilated or changed according to the whims of the moment. No ecclesiastical building in England would possess more right to have its outcries listened to than the cathedral of Hereford.

Prior to the middle of the seventeenth century, when the city was besieged by the Parliamentary army, the building seems to have been respected. Sir WILLIAM WALLER, who commanded the attacking forces, gave a guarantee that the cathedral would not suffer. But with zealots who were inspired by hatred of everything artistic which was employed as an auxiliary in Church services, it was inevitable that in the "purification" of the cathedral much vandalism would be perpetrated. After the restoration of CHARLES II., efforts were made to retrieve some of the mischief caused by the Puritans, but any work which was done under the circumstances was hardly likely to be conducted with discretion. At the beginning of the eighteenth century PHILIP BISSE was appointed bishop; he was liberal in expending money on restoration. He issued orders that the choir was to be "beautified throughout, and a most magnificent altarpiece to be erected, one of the stateliest and loftiest in England." HENRY EGERTON, who became bishop in 1724, was, like BISSE, disposed to transform the cathedral into something that would gratify the taste of the century. In 1737 it was related that "they are pulling down the venerable Gothic chapel belonging to the bishop's palace, in order to erect a more polite and neat pile in the present taste." The words indicate the spirit in which restoration was entered upon, and the mongrel forms which were to appear.

BISSE's decorations recalled what was then to be seen on the stage, and the mass of sham drapery with the big sham tassels might have been prepared by a scene-painter. It was thought, however, to increase the interest of a representation of the Last Supper. But it was not merely embellishment of the kind which deserved condemnation. The masons who were employed apparently lost their good sense along with the Bishop and the dignitaries. There is little doubt that the collapse of the west front and part of the nave of Hereford Cathedral in 1786 was caused by the mass of stone which was provided for safety. It was an excessive weight in the wrong place. This conclusion is justified by the remarks of JOHN CARTER, the architect, which were as follows:—

I now recall to memory some circumstances which preceded the destruction of the west end of the cathedral in the city. On viewing the west end I noticed that the north-west angle

of it appeared in a dangerous state, as several large fractures were apparent in many places. On expressing my apprehensions for the safety of the building, I was shown what had lately been done for preserving it from any danger that might happen from such appearances. I was shown a prodigious pile of masonry which had been raised against the inside walls of the above-mentioned angle. This business, I plainly observed, looked to me a palpable design to throw down the fabric, not to protect it. And my prediction was but too soon verified.

Another architect of the time foretold that other cathedrals were also likely to give way from the indifference of the authorities. "It is," he said, "partly through the neglect of the chapters and partly by the ill-management of the architects they employ, that they (the cathedrals) are falling about our ears." Happily this fear was groundless. It is not easy to determine the character of the vanished west front. BROWNE WILLIS gave a sketch of it, but the details are, we suppose, as incorrect as in the majority of his views. One writer says:—

The nave and aisles were flanked with square turrets, enriched, as the walls themselves were also, with several rows of intersecting semicircular arches resting on slender and short columns. The turrets were all surmounted with plain spires. The great west door was semicircular, deeply recessed and richly adorned. Over this door was a large painted window of Perpendicular character, which could form no part of the original design, but its insertion must have greatly weakened the wall above it, and contributed mainly to the downfall of the tower. The original windows were probably three in number, side by side, the centre one higher than the others and all of them round-headed and of one light each. The gable point of the nave was afterwards taken down, and the tower carried up instead of it to the height of 130 feet, and in its form and details bore a strong resemblance to the great central tower, which still exists. The original west front was the work of Bishop Lozing, the tower of Bishop Braoes, the former in the reign of William the Conqueror, the latter in that of King John. The great window must have been inserted about the beginning of the reign of Henry VI.

JAMES WYATT had taken up Gothic architecture only a couple of years before the fall of Hereford. Previously he was known mainly as a practitioner in the Italian style, but on the death of JAMES ESSEX in 1784, there seemed to be an opening for an architect who professed to understand the mysteries of Gothic. WYATT had not given much, if any, attention to the subject, and there were no books or engravings to enlighten him. But he was a daring man, with that conviction of his own infallibility which ignorance confers, and he undertook the restoration of Hereford Cathedral with a light heart, as if he were commissioned to add a retiring-room to his Pantheon. He was ten years engaged in his operations, and at the end of that time the cathedral must have been hardly recognisable by those who were acquainted with it in its former state.

It would occupy a large amount of space to enumerate the various items which make up the havoc which WYATT caused in order to demonstrate his superiority to the Mediæval architects. In 1827 the compiler of a guide-book, who was not unfriendly to him, gives the following summary of the new works and alterations:—"The total rebuilding of the west front without a tower, the foundations of which were removed 15 feet inward, and the nave

\* See Illustration.



consequently was as much shortened; the arcades and clerestory windows in the upper part of the nave altered from the circular to the pointed form; the vaulting of the nave renewed; the roofs of the nave, choir and transepts flattened; the spire taken down from the central tower, the battlements raised somewhat higher, and pinnacles with crockets placed at the angles." The Rev. THOMAS GARBETT, in his book on the cathedral, which also appeared in 1827, says:—"The foundation (the church) itself has been so much abridged, that of the four arches which perished with the tower two only have been rebuilt, and those without the least decorative feature. A change also took place in the interior, for which no reason has been assigned, and which merits unqualified condemnation, viz. raising the pavement so as to conceal the square basement of the pillars, and consequently to diminish the height both of the nave and side aisles. The choir was originally approached by a flight of steps; but these are now done away." After all these changes and omissions it is allowable to imagine that the old stones which were fortunate in surviving unharmed would mutiny at the loss of their companions and the introduction of new ones which bore no relationship to them.

WYATT'S alterations served for several years. In 1841 it became necessary to face another restoration. The work was placed in the hands of Mr. L. N. COTTINGHAM, who had already undertaken similar efforts at Rochester Castle, the chapel of Magdalen College, Oxford; St. Albans Abbey; Armagh Cathedral; St. Saviour's, Southwark; the Temple Church, &c. Hereford was destined to be his last work. The piers which supported the central tower had been constructed to support a shorter, lighter and earlier structure. The great Decorated lantern in course of time was from its weight crushing the piers. The interior walls, up to the bases of the fifty-two pillars surrounding the bell-ringers' chamber, were found to be in a ruinous state, for there were holes or cavities in them large enough for a man to enter, and many of the stones had succumbed to the pressure. COTTINGHAM said in one of his reports:—"I never witnessed a more awful monument of the fallibility of human skill than this tower at the present moment presents." According to his pupil, Mr. F. R. WILSON, he rebuilt each pier in turn on fresh foundations and with solid stones. He employed a forest of log scaffolding for the purpose, and displayed a profound knowledge of carpentry and the strength of timber in the execution of the work. By that exhibition of practical knowledge and power, and by the endurance for a long period of very anxious days and nights on the part of COTTINGHAM, we have handed down to us since and for all time the beautiful lantern of Hereford Cathedral, unrebuilt, unrestored and more durable than ever.

In his conclusions he was supported by Professor WILLIS. Another remarkable work was the restoration of the lady chapel, but the completion of this part was undertaken by Sir GILBERT SCOTT after the death of COTTINGHAM. The chapel was afterwards appropriated to the use of the parish of St. John the Baptist, Hereford, which, although sometimes referred to in the records, does not appear to have possessed a church of its own.

The cathedral, which during the last two centuries has been subjected to so many modifications, was probably less generally known than other buildings of its class in this country. One of the reasons was its remote position. It was an outpost between England and Wales. It was likewise assumed to possess some Welsh characteristics, and the names of many of its early bishops sounded foreign, if not fabulous, to the English ear. The site, as elsewhere, was from a remote age occupied by a church. Archbishop USHER, the Irish chronologist, says there was a See at Hereford in 544, and a Bishop of Hereford is believed to have attended a synod at Canterbury in 607. The building is under the patronage of St. ETHELBERT. At the end of the eighth century he ruled over the East Angles, and visited the Mercian court to claim the hand of OFFA'S daughter. The object of the journey was misunderstood, and was thought to be an attempt to obtain OFFA'S throne. ETHELBERT was murdered, and the body was carried for interment to Hereford. An "admirable stone church" was afterwards dedicated to the royal victim, and at his tomb many

miracles were said to be accomplished. Bishop ATHELSTAN, it is recorded, restored or rebuilt the cathedral, which was liable to attacks from the Welsh. In 1055 the Saxon Chronicle relates one of those raids and the plundering and burning of ATHELSTAN'S church. In the same year the Bishop died, and was buried in the church which he had built from the foundations.

At the time of the Conquest a foreigner, WALTER OF LORRAINE, presided over the diocese. He was succeeded by a fellow-countryman, known as ROBERT DE LOZINGA, who appears to have been one of those versatile ecclesiastics that arose occasionally in Mediæval days. According to WILLIAM OF MALMESBURY, he began to rebuild the cathedral, adopting as a model CHARLEMAGNE'S church in Aix-la-Chapelle. Many of his successors are recorded to have undertaken works in the cathedral; but it would be impossible to point out with any definiteness their respective contributions to the early work. REYNELM, DE VERE and others have parts attributed to them. EGIDIUS or GILES DE BRUSE or BRAOES, a son of Lord BRECKNOCK, is credited with the great central tower. In 1275 we read of the appointment of THOMAS DE CANTILUP; he was a type of the thirteenth-century scholar. He studied in Oxford, Paris and Rome, was Lord Chancellor, viceregal representative of HENRY III., and held various other exalted appointments; he died during a voyage to Rome, and his bones were transported to Hereford, where his beautiful tomb still exists. He was canonised, and his arms, three leopards' heads jessant, continue to serve for the See. The miracles reported as taking place at his tomb imparted a new interest to the cathedral. He may have had the chapter-house erected and a part of the cloister. THOMAS SPOFFORD, who occupied the episcopal throne for twenty-five years from 1421, is said to have expended on the buildings 2,800 marks. Bishop STANBERRY constructed a chantry chapel on the north side of the cathedral, where his remains were interred. EDMUND AUDLEY also added a beautiful chapel, which still bears his name. CHARLES BOOTH, who died in 1535, built the porch on the north side of the building.

After the Reformation building bishops are rarely heard of in Hereford. JOHN SCORY pulled down houses, sold lead, and by other means amassed great wealth, which was squandered by his son. FRANCIS GODWIN, who was an able scholar, and was promoted from Llandaff to Hereford in 1617, was, according to BROWNE WILLIS, a Simonist, and disposed of all the property he could seize for the benefit of one of his sons or daughters. MATTHEW WREN, the stout old cavalier who, after twenty years' imprisonment in the Tower, declined the liberation which his nephew, CHRISTOPHER WREN, obtained for him from CROMWELL, was Bishop of Hereford for a year. As a rule, however, divines who had gained a reputation as preachers or writers avoided Hereford. Its remoteness from the Metropolis, and from Oxford and Cambridge, was not inviting, and it holds in consequence no important place in modern ecclesiastical history. The records of an earlier time were carried off by one SILAS TAYLOR, a Parliamentary officer, who is described as having "more than an ordinary fancy and respect for books and learning;" when he died all his documents fell into the hands of his creditors.

We must take Hereford Cathedral as it exists, with all the imperfections which have followed from attempts at restoration. It represents the English varieties of Gothic. It might have been more interesting. WALLER'S soldiers are said to have removed 170 brasses, and in 1786 two tons of those memorials were sold to a brazier. In truth, little more than the bare walls have survived, and they in many parts have been tampered with. That so much impressiveness remains is a wonder.

**Coronation Honours** have been bestowed on a few artists. Sir E. J. Poynter, P.R.A., will become a baronet, Mr. William Emerson will be knighted; the same honour will be conferred on Mr. Ernest Waterlow, A.R.A., president of the Royal Society of Painters in Water Colours. Lord Kelvin has been made a Privy Councillor, as well as a member of the new Order of Merit, to which latter Mr. G. F. Watts, R.A., has also been appointed. Taw Sein Ko, M.R.A.S., F.A.I., F.S.A., Government Archaeologist, Burma, is to be granted a gold medal for public services in India. Mr. William Mather, M.P., has been made a knight.



## HISTORY IN DECORATION.\*

IT is generally accepted that a painting should represent only one subject, although subsidiary incidents may be introduced. It would be clearer to say that in the art, as in photography, a single moment is permissible, but whatever is taking place at that time can be depicted. If we consider MACLISE'S *Meeting of Wellington and Blucher* and *The Death of Nelson* as examples of the latest form of historical painting, we shall find that many varieties of action appear before our eyes, and that the attention of all the figures is not concentrated on the shaking of hands of the English and Prussian commanders, or on the expiring hero in the cockpit. Although extraordinary industry has been expended by the painter in giving completeness to the two historic scenes in order to suggest the magnitude of war, it is still felt by the spectator that much more is required. By nature we are impelled to look before and after, and MACLISE'S two pictures cannot be understood unless we are able to recall the circumstances which followed as well as those which preceded the death of NELSON and the meeting of WELLINGTON and BLUCHER.

Every educated man is enabled from his books and from traditions which are familiar as household words to comprehend the significance of the subjects which are illustrated by the two wall-paintings. But in more primitive days when books were few and costly the painters endeavoured to compensate for the deficiencies of their art by introducing a succession of incidents in the same picture. They sought control over more than one moment and made time subservient to their needs. It was objected, for instance, to the works of POLYGNOTUS, in Athens and Delphi, that he did not restrict himself to simultaneous action, but showed in the same work events which were separated by intervals of time. It has been urged by some of his defenders that the series relating to the war with Troy or the battles of the Amazons consisted of a number of independent paintings, and might be comparable to some of HOGARTH'S tragic comic series which resemble the chapters of a realistic novel. We should perhaps be nearer the truth if we believed that the Greek painter's work was executed on a like principle with GOZZOLI'S *Noah and his Family*, or his *History of Joseph*, which are known to all students of art from the engravings. In the latter, not only several periods of time are united and JOSEPH appears in three places, but, as LESLIE remarks, GOZZOLI has also adopted three different points of sight in the perspective. In spite of the violation of law the result is harmonious.

The arrangement which combines past and future with the present, although contrary to theory, has a peculiar advantage whenever painting is employed for educational purposes. An event ceases to be a single detached incident, and becomes more impressive when it can be perceived as if it were a link in a chain forged by destiny. Everybody wishes to see many things by a glance without the trouble of following them one by one and observing each separately. It may be wiser to pursue the latter course and to be analytical, but greater pleasure is given when we have a synthetical demonstration which becomes more pregnant of meaning than the historian's narrative.

There is one illustrious precedent for the treatment in the Shield of ACHILLES. On it were to be found side by side transactions which bore little or no relation except as parts of human life. The marriage festivities comprised various scenes from the leading of the brides out of their chambers unto the sumptuous banquets. There were besides dances of striplings, the proceedings when a mulct for a blood-feud was to be assessed, the appealing to the judges, the clamouring of partisans, and the elders giving judgment. There was also shown the investment of a town and a dispute among the besiegers as to whether it should be destroyed or its inhabitants and their property divided as spoil, an ambush from the town, the carrying-off of cattle, the fight to recover them, agricultural scenes with men ploughing, reaping and binding, a vintage scene, oxen attacked by lions, a labyrinth with a dance, and a performance by acrobats. Modern designers who have attempted the reproduction of HOMER'S description have sometimes divided the incidents by means of ornament in order to emphasise the absence of connection, but it is likely that in

any work which the poet had viewed and which suggested his verses the different occurrences blended like the waters of several streams. The Greeks must have known how easily joy and sorrow are commingled in this world, and one changed to the other with the suddenness which was witnessed last week in London. Old CAPULET expressed one of the peculiarities of life when he said:—

All things that we ordained festival,  
Turn from their office to black funeral;  
Our instruments to melancholy bells,  
Our wedding cheer to a sad burial feast,  
Our solemn hymns to sullen dirges change,  
Our bridal flowers serve for a buried corse,  
And all things change them to the contrary.

When it was decided in the time of the third NAPOLEON to remodel the Salle du Trône, in the Luxembourg, by turning three large chambers into one, the walls were to become representative of the history of France, the climax being reached by an apotheosis of NAPOLEON I. There was a hemicycle at each end of the Salle about 40 feet in length, and M. LEHMANN obtained the commission to fill them with subjects, one suggesting the Merovingians and the Carolingians, and the other the Capets, Valois and Bourbons. We now reproduce the second work. At first sight it would appear to be impossible to depict with any completeness the history of six centuries in a space so restricted. It would, of course, be easy to cover the wall with a series of independent illustrations like those which in our time have been employed in the Panthéon. M. LEHMANN was, however, ambitious to combine unity with variety, and to make his picture recall not only what occurred, but to reveal in it an acceptance of the most rigorous laws of composition; hence the care which is taken in the balancing of the groups.

Accordingly he has made the figure of JOAN OF ARC the centre of his composition, and by introducing a pedestal for her to stand on she becomes more exalted than any of the kings. At her feet are some of the English warriors she conquered; two of them would serve for Lord TALBOT and his son JOHN, as described in the trilogy:—

Soldiers, adieu! I have what I would have  
Now my old arms are young John Talbot's grave.

The peasant girl may be accepted as the embodiment of enthusiasm and courage, and those qualities, it will be found, are exemplified in all the types of Frenchmen which were introduced.

Take the earliest scene. PETER THE HERMIT was a Frenchman, and lived in Amiens before he visited the Holy Land. It was at the Council of Clermont, in France, the resolution was adopted to advocate a crusade for the recovery of the Holy Sepulchre, and it was presided over by a French Pope, URBAN II. Another French Pope, SILVESTER II., had earlier made an appeal by letters to the Christian princes, but URBAN II. and PETER exercised their eloquence directly on the people. Upwards of a million of men of all ranks, it is said, resolved to abandon their country and their homes to participate in the struggle. The numbers were much reduced by the time the Holy Land was reached, but in the course of three years Jerusalem was captured, and a French kingdom founded in Palestine.

The primary aim of the Crusades was to establish the Christian power as supreme in the Holy Land. But it had other ends besides. What is now known as France did not exist at the close of the eleventh century. There were a great number of duchies, principalities and lordships, and they were continually at war. The Crusades allowed Normans, Bretons, Burgundians, Gascons and other people to have one object in common. Civil war was therefore suspended for a time to the general advantage. By their contact with Easterns the ideas of Frenchmen expanded, and as a consequence a new impulse was imparted to the arts. The effect is observable during the reign of LOUIS VI. He was constantly at war with the barons, whose strongholds surrounded Paris, and who for a time were able to keep the king a prisoner, but in spite of all obstacles he instituted communes, and a new force appeared in the School of Paris, of which ABELARD and WILLIAM of Champeaux were members. The School and the Church were identified, and when LOUIS VII. attempted to control the combination he was excommunicated.

\* See Illustration.



PHILIPPE AUGUSTE, the hero of the next group, ascended the throne in 1180, and during forty-three years he was engaged in one continuous combat. There is a prejudice against him in England, for he was the rival of CŒUR-DE-LION in the third Crusade; he fought against RICHARD in Normandy and seized a great part of that country. He was no less successful in his war with the other princes. It was not only as a warrior that he gained fame. He enclosed Paris with a wall which was defended by 500 towers, he introduced order in the city and it may be said he was the creator of the University of Paris, or as it was then called: L'Etude de Paris. The students were not in favour with the citizens; town and gown rows were common occurrences. The students, it must be said, were disposed to take airs on themselves, and they contrived to live expensively regardless of the inconvenience to others. Claims for the payment of debts must have originated many of the contests. But the king made a law by which all the inhabitants of Paris were obliged to take an oath that they would denounce anyone who maltreated a student. In all such cases the trials were to take place before ecclesiastical tribunals, and as the students were to some extent recognised as clerics, it is easy to understand that justice was occasionally one sided and was rarely tempered by mercy.

LOUIS IX. is too generally thought to be only a tool of the monks, and the conventional representation of him in ecclesiastical decorations with a monk's robe beneath the royal cope has helped to support the idea. There was no doubt he was opposed to the luxury and vices which were then common in courts. But there never was a king on the French throne more anxious to secure justice for all classes, and he was more resolute than our English HENRY II. in insisting on a reform of ecclesiastical tribunals. On many occasions he proved his bravery. Above all, he was eager to have his laws observed. He acted as a judge himself, and was not less severe and impartial because his tribunal was sometimes under a tree in the forest of Vincennes. The great vassals and officers who by tradition and usage should unite with him in trying cases abandoned judicial offices, and it was necessary to have recourse to professional lawyers. In that way the French courts commenced which, amidst many difficulties, have continued to be a credit to France. No rank was sufficient to screen a criminal from the punishment which was meted out to him by LOUIS. It is no wonder, then, that the reputation of the king for equity was so universal that even the English barons of the time begged him to become arbitrator in their differences with the crown.

If King LOUIS can be regarded as the representative of the Mediævalism of the thirteenth century, FRANCIS I. stands in a similar position with the Renaissance. He was far from being a perfect monarch. It seems incredible that a king who is still accepted as the type of intellectualism should have passed an ordinance by which printing was prohibited under pain of death. "Woman often varies" was a favourite expression of his, and no better words could be employed to describe himself. A month afterwards he issued a second ordinance which allowed the printing of books under certain conditions. Free thought, however, continued to be hazardous, for ETIENNE DOLET perished at the stake. RABELAIS contrived to escape, although there can be no question that his Gargentua was FRANCIS I., and in M. LEHMANN'S group he appears laughing as if his enjoyment of life was not affected by the king's presence. It is quite characteristic of the monarch's peculiarities to see him discussing the *Thesus* with BENVENUTO CELLINI, while his arm is around his dwarf TRIBOULET. In the background the new spirit is seen withdrawing the winding sheet from the statue of ATHENÉ, which serves to suggest the revival of classicism.

HENRI QUATRE was less courtly than FRANCIS I., but he was more magnanimous. The sovereign of Navarre was always in war, and war of the worst kind, for it was inspired by differences about religion. Although many of the chiefs who surrounded HENRY IV. were as morose as the English Puritans of a later time, he was always disposed to be clement. He long fought against Paris, but when at last the gates were opened he entered as a friend rather than as a conqueror, and M. LEHMANN shows him sheathing his sword. One of his first acts was to destroy the records of

the Seize, the governing power of the city, in order that there might not be evidence available against his enemies. He had many great works executed in Paris, not merely for show, but for utility, such as the Samaritaine, by which water was distributed throughout the city. No matter what services he rendered the fanatics could not be subdued, and no less than sixteen attempts on his life were made in Paris. Finally the wretched RAVAILLAC succeeded.

The contrast between the group of Crusaders at one end and LOUIS XIV. with his ministers and courtiers at the other extremity of the hemicycle could not be easily surpassed. Selfishness takes the place of faith. The figure of the king recalls THACKERAY'S sketch, in which LOUIS appears as a very ordinary mortal and "Rex" is constituted by the State garments, the perruque and the sceptre. The Roi Soleil is represented as taller than any of the grandees about him, but that is hardly a painter's license, for, such is human infatuation, the subjects of his time imagined the king to be of unusual height. With LOUIS XIV., however, the monarchy became absolute, for he looked on himself as not only the ruler of men, but as the proprietor of all the property possessed by his people, whether clergy or laymen. Arts and manufactures were not neglected during his reign, and efforts were made to attract able foreign workmen to France. By the revocation of the Edict of Nantes more than an equivalent to the newcomers were banished from France. As Madame DE SÉVIGNÉ said, the dragoons had been very good missionaries, and not only weavers but great captains like SCHOMBERG were expatriated. It was in vain men of experience such as Marshal VAUBAN besought the king to be tolerant and to be equitable in raising taxes. The great military engineer was treated as if he had committed sacrilege, and his admirable book on taxation, "La Dîme Royale," was hung in the pillory. The successors of LOUIS had to suffer through the misgovernment of the king, but it will always be assumed that he made France supreme in Europe, and on that account his memory will always find idolaters. LOUIS XIV. was entitled to have a position on the walls of the Luxembourg, for he purchased the buildings from the Princess ELIZABETH OF ORLEANS in 1694. At the time it was known as the Palais d'Orléans, a title which superseded its original name, Palais Medicis. The name Luxembourg originated with a duke called PINEY-LUXEMBOURG, who had purchased a mansion which stood on the site before it came into the possession of MARIE DE MEDICIS.

Whether they belonged to the Capets, the Valois or the Bourbons, the French kings were compelled to be familiar with war. NAPOLEON I. was not therefore out of place amongst them, for he only continued the tradition of PHILIPPE AUGUSTE, or, as an outsider, of JOAN OF ARC. Without war many Frenchmen think their country could not endure, and hence the prominence of military scenes in the decoration of public or private buildings.

## ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE concluding meeting of the session 1901-2 was held on Monday evening, June 23, Sir William Emerson, president, in the chair.

The PRESIDENT delivered the following address on the presentation of the Royal Gold Medal to Mr. T. E. Collcutt:—

I have to perform the most pleasing duty which falls to the lot of the President of the Royal Institute of British Architects, namely, to present to a distinguished colleague, a member of the profession and of the Institute, the King's Gold Medal.

This medal is the greatest honour the Institute has in its power to confer on those who have distinguished themselves by their work, or in furthering the art of architecture. The first to whom it was given was Charles Robert Cockerell in the year 1848, and the last was Professor Lanciani in the year 1900. In 1901, owing to the death of our late beloved and lamented Queen, it was not awarded at all. Since then His Majesty the King has, as you all know, graciously signified his intention to continue its presentation. Amongst the list of those who have received the medal are a large number of our most distinguished brethren, and also a number of eminent foreigners, for this Institute is not narrow-minded, but cosmopolitan in its views. Amongst the recipients are the names of Cockerell, Barry, Donaldson, Smirke, Scott, Viollet-le-Duc, Pennethorne, Wyatt, Street, Pearson, Penrose, Garnier, Hunt, Leighton, Aitchison, Bodley, Lanciani. And I think, gentle-



men, that you will agree that the name of Thomas Edward Colcutt is a fitting addition to such names.

The presentation of this medal conveys the recognition that the recipient's life in the cause of our noble art has not been passed in vain, and that the profession appreciates the services he has rendered in the advancement of the art of architecture, and that the King ratifies and endorses the view taken of the work he has produced. In the architecture of the moment there is much to make us hopeful, and that this medal should be presented to Mr. Colcutt is an indication that the feeling in regard to architecture just now is distinctly against a slavish reproduction in our modern work of old examples, and also equally against the foolish ignoring of all precedent as a means of arriving at original productions. Mr. Colcutt has evidently carefully studied and reflected on the best examples of both Classic, Gothic and Renaissance work, and has thus marked out a distinctive line or path for himself. This is evident in such works as the Wakefield Town Hall, the Imperial Institute and the City Bank on Ludgate Hill. I reiterate that this freedom from the trammels of precedent, coupled with study of precedent, is the most hopeful sign for the advance of architecture in this century. It is well done that His Majesty should confer the honour of the Gold Medal on our distinguished confrère, Mr. Thomas Colcutt, for in so doing the cause of our art is, I think, greatly helped forward. Though you all well know Mr. Colcutt's work, the following is a list of some of his most important productions, and the order in which they were carried out, commencing in 1872 with the Blackburn Free Library—and in following years the Wakefield Town Hall, the Imperial Institute, the P. and O. offices in Leadenhall Street, the City Bank (Ludgate Hill), the Beckstein premises and hall, Lloyd's Registry of Shipping, besides the decorations of many of the saloons of the P. and O. steamers and a number of country houses and business premises. In all these works there is a most distinctive character and artistic feeling, combined with much originality of treatment, yet without any evidence of straining after such originality, and affectation is entirely absent from all his work.

Mr. Colcutt, I have the distinguished honour of handing to you the King's Gold Medal for architecture, and heartily congratulate you on the honour so conferred upon you, and most heartily wish you further success, and a long life and health to enable you to continue your work in the future.

Mr. COLCUTT, in reply, said:—I beg to thank you, sir, most heartily for the kind terms in which you have spoken of me and my work, and to express to the members of the Institute my heartfelt appreciation of their goodwill towards me in suggesting my name to His Majesty the King for the honour of being Royal Gold Medallist for this year. The Gold Medal was founded for the promotion of architecture, and although I cannot lay claim to having aided this desirable object, I can yet be proud of being a member of this Institute, which, in my opinion, has undoubtedly done very much for the promotion and encouragement of our art. I think the Institute more than any other body has been instrumental in encouraging a diligent study of architecture. It has aimed at fostering a high ideal in the minds of our students by assisting them to a knowledge and appreciation of the best examples of ancient architecture. It is satisfactory to observe that students have been eager to profit by the advantages offered to them in the form of annual prizes, medals and studentships. The drawings and sketches submitted in competition for these prizes are marvels of patient, diligent and artistic study—study ranging from the purest Classic to the Mediæval and almost to the Victorian age. Now, sir, in my opinion this work of the student is laying the foundation of a wide knowledge that will enable him to deal with his real work in a scholarly, catholic and artistic manner, and also to meet the demands of modern requirements in the spirit in which the great masters designed and built. The Institute has also promoted the advancement of architecture by the encouragement it gives to the study of the art of building as well as to the fine art of architecture. Our examinations deal very largely with the various details of construction and with the many mechanical trades that go to the forming of a building, and no student can be fully equipped for his future work in life unless he is a builder as well as a designer of architecture. In this way I think the Institute has done more for the promotion of architecture than it would have been possible for individuals to do, however distinguished they may have been. And now, sir, while thanking you for the honour you have done me, I wish to add that the natural and, I think, excusable feeling of elation with which I learned that the King had graciously sanctioned your recommendation was not untempered by sadder thoughts. I allude, sir, to the most sincere regret and sorrow felt by us all, that one whom we unanimously wished to honour was suddenly taken from among us before the distinction we intended could be conferred upon him, and alas! before his great work was finished. Only a few weeks before the death of Mr. Bentley I had the privilege, together with other friends, of being conducted by him over his magnificent cathedral.

That work, so far as the interior is concerned, is left unfinished, not much more than a shell, but a very noble shell. Both architects and public have sustained an irreparable loss. We shall not now see the outcome of that definite co-operation of the architect and painter-mosaicist, a co-operation which justified us in expecting the most noble results, because, though rarely seen, it is founded upon a true principle. Let us fervently hope that whatever decoration of the domes may be decided upon, it will be entrusted only to those who have a knowledge and feeling and enthusiasm for the architecture of the building. And also may we hope that sufficient funds may be forthcoming to complete this great architectural monument in a manner worthy of the genius of him who designed it. Sir, I am deeply grateful for the honour done me in placing me on the roll of the gold medallists. There may be many more deserving of this honour than I, but there is not one who has more earnestly wished to further the cause of our art.

At the conclusion of the business Sir W. Emerson addressed the meeting. He said:—After so many years of intimate relationship with the active work of this great Institute, I have this evening, in a way, to say good-bye to you and to my valued friends and colleagues on the Council, for after leaving this chair you all know that your presidents cease from active work in connection with the Institute's affairs. In now vacating the honourable position in which you so kindly placed me three years ago, I can only assure you that I have deeply appreciated the confidence and honour you reposed in me by entrusting the guidance of the Institute to my hands and head. If in any respect I have failed to give you satisfaction or disappointed your expectations, I pray you to forgive me; if, on the other hand, you think that I have added in any degree (as I have ever endeavoured to do) to the interest or influence of the Institute, all I can say is that I am truly thankful, for that has been my one and only aim, and the feeling that has prompted all my efforts in acting in the capacity of president. I have always felt that this Royal Institute should be the real and only representative body of architects for the whole of the British Empire, and my conviction is that it will fast become so if we are true to ourselves, strong and not wanting in *esprit de corps*. If we let our voice be heard, with no wavering or uncertain sound, on all important matters relating to our art and our profession, before many years have passed the Institute should hold the influential position it ought to do, and there should be scarcely anyone worth calling a member of the profession who would care to stand aloof. As it is, I think it must be somewhat of a selfish feeling which prevents men of standing in a profession from assisting their brethren by adding their influence and power to the representative body of that profession, so as to assist in upholding the common interests and strengthening the position of those following their own calling. With divided ambitions and counsels the profession will be weak, and will be dictated to instead of dictating. With unity we shall have influence and strength, and shall be less subjected to the humiliating circumstances we occasionally have to deplore in the dealings of employers, whether public bodies or private individuals, with the architectural profession. Above all things, we must not let our selfish interests cause doubtful lines of conduct to be entered upon. This has, I fear, been the case occasionally even amongst those who have been loud in their condemnation of unprofessional conduct in others. Let us above all things be honourable gentlemen, straightforward, firmly joining together in leading this great Institute to a position of respected influence that cannot be gainsaid. And now, gentlemen, I wish you all farewell. To my colleagues I can only say that when I first became a member of the council some sixteen years ago I hardly knew any of the members; now I feel that I am leaving many friends for whom I have learned to have the greatest regard and respect, and, indeed, I trust the feeling is reciprocal. You can understand, therefore, if I feel a little sad to-night, notwithstanding that I am laying aside a burden of responsibility which has sometimes weighed heavily upon me. I thank you all, colleagues and gentlemen, for your wise counsel and kindly help, and for the loyal and constant care with which you have aided me during my term of office. Mr. Aston Webb has now to take over the badge and chain of office as your future president. In handing them over to his care I do so with the certainty that under his guidance the Royal Institute of British Architects will give forth no uncertain sound, and will increase in numbers, influence and prestige.

Mr. F. C. PENROSE, F.R.S., D.Litt., D.C.L., past president, said he was sure he should have the agreement of the meeting in proposing that the thanks of the Institute be accorded to Mr. Emerson for his action as president during the three years he had held the office. His strong, well-considered rulings had in every case been useful to the Institute, and doubtless his judgment would now be bequeathed to his successor, in whom they had every expectation of satisfactory work in the strong and clear course that should be followed for the benefit of the Institute. Members must all desire to thank Mr. Emerson, too, for the admirable addresses he had delivered



during his term of office, and for his final word of benediction to the cause of the Institute.

Mr. ERNEST GEORGE asked leave to second Mr. Penrose's vote of thanks to the President, who had conducted the affairs of the Institute for them in so marvellously wise and kind a manner. One felt that his judgment had been good in all matters that had been brought before him, and he had used his energy for them always in a most courteous, kind and thoughtful manner. They had very much to thank him for, and said good-bye to him in his capacity as President with the greatest regret, tempered only with the knowledge that Mr. Aston Webb was to follow him, and that all Mr. Emerson had been doing would be carried on with equal judgment and wisdom by Mr. Webb.

Mr. JOHN SLATER, vice-president, having formally put the motion to the meeting, the vote was carried by acclamation, and briefly responded to.

### THE USE OF THE BEAUTIFUL.

A COLLECTION of about fifty pictures has been obtained for exhibition at Fountainbridge, Edinburgh. Most of them were painted by Scottish artists. At the opening of the exhibition, the Rev. Dr. Cameron Lees delivered an address. He said they had before them a loan exhibition. People who were the fortunate possessors of good pictures had sent them there to give pleasure and to be of use to others. He was afraid that most of them only cared to part with what they found in some measure superfluous, but the generous lenders of these pictures had parted with treasures that were very precious to them, and they had parted with them for a time in the hope that they might give pleasure to others equal to that which they themselves had received. What was the pleasure in gazing upon things that are beautiful he need not enter into. What was the beautiful itself had been an object of contention among metaphysicians in all ages. Some had said that the essence of the beautiful was an innate feeling in their own hearts. Others had said that the beautiful consists in certain qualities that belonged to the object that they looked upon, and others had resolved the beautiful altogether into utility, saying that that only was beautiful that was useful and which fulfilled the end for which it was made. He was not going to enter into these subtle disquisitions. For his own part, he was entirely with Wordsworth, who believed that the beautiful consisted in a certain mystical, spiritual element with which they were brought into contact—that there were three great aspects of the infinite perfection, the true, the good and the beautiful, and that when they came into contact in any way with the beautiful, however much they derived pleasure, it was in being brought to the fringe of a mystic and spiritual world, of a something deeply interfused, whose dwelling was the light of setting suns and the round ocean of the living air. Nor could they forget that Our Lord Himself seemed to have regarded, certainly in His parables, outward things as the images and the types of a higher and a spiritual world, and that He saw in the flowers the emblems of a mystic beauty greater than the glory with which Solomon was arrayed. But however that might be, whatever might be the pleasure that they derived from the beauty of nature or from the beauty of art, it was a great thing that they were able to share it with others. It was a great thing, he thought, that in that district where men were engaged continually in the labours of common life such an exhibition should be opened. He was sure he expressed the hope of those who had so generously lent the pictures that the exhibition might have a refining element, and that it might not merely have a refining element, but that it might give real pleasure to multitudes of people. He thought if he expressed their feelings it would be in the words written over the Royal Academy in London, which they hoped might be true even of that lesser effort—

The hearts of men which fondly here admire  
Fair seeming shows, may lift themselves up higher,  
And learn to love with zealous humble duty  
The eternal fountain of that heavenly beauty.

### CONWAY CASTLE.

IN a letter to the *Times* Mr. C. H. Bothamley writes:—I beg to be allowed to call attention to a danger which at present threatens one of the most interesting parts of the ancient castle at Conway, hitherto one of the most valuable of Mediæval relics, partly by reason of its intrinsic interest and partly because it has in the past escaped the devastation of the restorer and rebuilders. Unfortunately, unless active steps are taken in its interests it will not longer enjoy this good fortune. The Town Council of Conway, with, it is stated, the approval of a public meeting, has decided to celebrate the Coronation of His Majesty the King by "restoring" what is called the

Queen's or Eleanor's tower in the castle. This is the north-east tower, which contains on one floor the well-known oratory with its attached side-chambers and, on the floor above, the great fireplace and window recess of an apartment of unusual magnificence for its date and position. In general character and arrangements this tower is in fact unique amongst the many remains of Mediæval military architecture in this country. A public appeal has been made for subscriptions with a view to raise the sum of 500/, which it is estimated the proposed restoration will cost; and it is obvious that with such a sum a great amount of mischief may be done. In support of this appeal it is urged that the tower is of national interest, and that it has fallen into a very ruinous condition. The first statement is certainly true, but provides the strongest argument in favour of keeping the tower as nearly as possible in its original condition; the second statement is also true if it means that the ornamental detail of the oratory has practically all perished, but is open to great doubt if it is intended to refer to the fabric of the tower. Probably some pointing and, perhaps, some grouting would be advantageous; but both internally and externally the tower itself seems to be quite sound, some repairs that were necessary in the interior having recently been well carried out by Mr. De la Motte, the borough engineer and surveyor. I submit that anything beyond the work necessary to insure stability would be sheer vandalism, and would destroy for ever the great interest which now attaches to this tower.

I was unable to ascertain in Conway exactly what it is proposed to do, and I gathered that no definite scheme had been framed a few weeks ago; but it will illustrate the kind of thing that may happen if I say that one of the proposals that have been discussed was to put into the tower a floor and a roof, so as to provide a shelter room for trippers. Fortunately this proposal met with much opposition.

It is still true that "the castle and town of Conway form together the most complete and best preserved example of Mediæval and military architecture in Britain;" but it will not be denied that the castle owes very much of its attraction and interest to the fact that, so far, it has not been disfigured by unnecessary rebuilding, nor by the erection of accommodation for trippers, which makes such eyesores at other places of the same kind. It is with a desire to prevent any such misfortune that I venture to call attention to what it is proposed to do, and to express a hope that not only may the appeal for subscriptions for this purpose meet with no response, but that sufficient influence may be brought to bear on those concerned to lead to the abandonment of the proposal and the adoption of some other method of celebrating the chief event of the year. To do irreparable injury to the grandest monument of Edward I. would surely be a most unfortunate way of attempting to do honour to Edward VII.

### THE ST. LOUIS WORLD'S FAIR.

THE United States Congress have agreed to an amendment authorising the postponement of the opening of the World's Fair, formerly fixed to be held at St. Louis in 1903. Under this enactment it will be opened on May 1, 1904. One of the principal reasons for delay is that the plans originally fixed for this universal exhibition, organised to commemorate the purchase of the great territory of Louisiana, have been much enlarged. As one State after another appropriated money for exhibits, it became apparent that more time for preparation was necessary. The most important argument in favour of a postponement was that presented by foreign countries, and the additional year will be used for improving the quality of the exhibition rather than for enlarging its scale. Assurances were received from nearly all foreign countries, as well as from many States of the American Union, that the postponement would be most welcome to them. Meanwhile work has been going on steadily. The commission from France has already visited St. Louis, and the Chief Commissioner from Canada, Mr. William Hutchison, has also been and made his preliminary arrangements. The Dominion has made a first grant of 125,000 dols. for its buildings and exhibits. Four of the largest buildings, covering a space of nearly a mile, are already under construction, while the work upon the grounds is proceeding as rapidly as possible.

The Late Mr. C. Gassiot, it is again announced, has bequeathed to the trustees of the National Gallery one of his pictures by Patrick Nasmyth, one of his pictures by William Collins, R.A., two pictures *The Prison Window* and *The Gossips at the Well* by John Phillip. He bequeathed the remainder of his pictures, excepting family portraits, to the Corporation of the City of London for the Guildhall Fine Art Gallery. A sum of a quarter of a million will probably be acquired for the benefit of St. Thomas's Hospital.



### NOTES AND COMMENTS.

FRENCH designers and modellers must be inspired to attain perfection when they find that the foremost artists are willing to take part in assessing the value of their work. The Society for the Encouragement of Art and Industry lately offered prizes for the decoration of a serrurerie, or, in other words, the lock-plates of a folding door. The Minister of Public Instruction and Fine Arts gave his aid, and among the jurors who accepted the duty of examining the designs were M. ROTY, the medallist; M. VAUDREMER, the architect; M. GÉROME, the painter, and several other artists. No less than 292 designs were sent in from Paris and various provincial cities. The first prize was bestowed on a student of the school of industrial arts in Rheims. Rouen carried off three prizes. Students from Rennes and Lyons were also successful, and there were eight Parisians to whom premiums were awarded. In this case, as in others like it, everything is voluntary, and yet it is asserted that nothing can be done in France unless by officers of some administration. In England, on the contrary, where freedom prevails, the prizes to students in schools of art are given on the reports of official examiners who have very little liberty of action. As a consequence, the students' works are remarkable for monotony.

EFFORTS are being made in Paris to obtain more recognition for the designers and modellers who produce the examples of the subsidiary arts which are now seen in the two salons. It is only of late years that the scope of those exhibitions has been widened. At one period in the older salon of the Society of French Artists nothing was to be seen but paintings, statues, architectural drawings, engravings and a limited number of water colours. The second and rival salon from the first showed some recognition for minor arts, and as time went on more variety was permitted. The arrangement has been advantageous, for the statuettes, jewellery and pottery gave more interest to many of the visitors than the works which alone are supposed to be examples of fine art. But as the examples of industrial art were exhibited in the names of vendors the creators, whether designers or modellers, have remained unnoticed. In other words, capital has carried off the honours from invention. That is a result which is contrary to French principles. The humblest man expects to derive a little *éclat* from his work, and a designer who probably has devoted much time and thought to a creation in metal, clay or wood feels he has as much claim on the attention of the public as a painter or a sculptor. The younger Society has evinced an inclination to do justice to the craftsmen, but the older body as usual creates difficulties in order to gain time before coming to a decision. Credit must be given for any success that has been met with by the art workmen to M. FRANTZ JOURDAIN, the architect.

In England we assign the credit for the first application of coal gas to lighting to WILLIAM MURDOCH, who had so far succeeded in 1798, he was allowed to illuminate the works of BOLTON & WATT at Soho, near Birmingham. LEBON, a Frenchman, patented the employment of gas in 1799. It is now claimed that MINCKELERS, who was a professor of physics in Maestricht, had ascertained the utility of gas at an earlier time. He published a pamphlet in which he announced that on October 1, 1783, he was able to obtain a cubic foot of gas from 4 oz. of coal. In the same year his gas was used for filling some small balloons, and in 1785 his lecture-room was illuminated with "burning gas out of distilled coal." On account of the priority of his discovery an effort is now being made to erect a memorial of MINCKELERS, who also, it is said, found out a method of purifying gas by means of lime. Holland has not produced many men who were capable of applying science to practical uses, and few will care to dispute the claim of MINCKELERS. But all important inventions or discoveries appear to have occupied the attention of several men at the same time.

FRENCH law concerning accidents to employés is as uncertain as our own. A notable instance has been afforded. In December last at a rehearsal in the Variétés Théâtre, Paris, a staircase which was meant to resemble

CHARLES GARNIER's in the Opéra House suddenly collapsed, causing serious accidents to some of the performers. The sufferers brought actions against the director, M. SAMUEL, and succeeded in gaining damages. Damages were also awarded against the stage-carpenter, who had not fixed the structure in a safe manner. The latter cast all the responsibility on M. SAMUEL. The case was brought before the Court of Appeal in such a way that the whole of the circumstances could be fully investigated. M. SAMUEL was supported by several of the directors of Paris theatres, and they testified that the stage-carpenter or machinist should have warned the director and explained to him the condition of the structure. The President of the Court, with the other judges, quickly decided in favour of M. SAMUEL. The judgment is sufficient to reveal the variability of French law, but it would be no doubt set aside in another court, and, in fact, the game of legal see-saw could be interminably carried on.

It was well said by THÉOPHILE GAUTIER that the Alcazar, or palace of CHARLES V., at Granada, would merit admiration if it were found in any other position; but it can receive only execrations when it is known that to gain a site it was necessary to demolish some of the charming buildings of the Alhambra. The palace was designed by PEDRO MACHUCA and the decorations by ALONZO BERRUGUETE, who was a painter and sculptor as well as an architect. The trophies, bas-reliefs and medallions of the façade are vigorous examples of ornamental sculpture. The circular court with its marble columns is magnificent, but *non erat hic locus*. The building was never completed, although it was over a century in the hands of workmen. Once more there is a chance of resuming the operations which were abandoned in the seventeenth century. By a royal decree a competition has been opened for the preparation of plans, which is, however, restricted to Spanish architects. The drawings are to be submitted in November. Foreigners, at least, will hope that it will not be needful to have another destruction of Moorish buildings in order to realise the selected project.

THE proposed restoration of Conway Castle has excited alarm, especially as it was believed the work would be conducted by the Town Council. A letter was lately addressed to the town clerk from the Society for the Protection of Ancient Buildings, in which it was urged that if the Mayor and Corporation have decided to restore the Queen's Tower they ought to reconsider the question, inasmuch as this tower is quite the most valuable remaining portion of the ruins of Conway Castle, a building almost without an equal of its class. The addition of new work, which is not purely work of upholding, must necessarily detract from the historical and artistic value of this exceptionally interesting building. Posterity will certainly regret any such additions, and public opinion has already so largely changed that the Society feel sure even now the action of the town, if it attempt to "restore" this building, will meet with strong disapproval from a large section of the public. One of the members of the Council said they never contemplated anything beyond works of protection. The fact that Messrs. CLARENCE WHAITE and HAROLD HUGHES, two of the highest authorities on art and historical architecture in the country, had been consulted in the matter would be a sufficient guarantee for the spirit in which the Council approached this question and the object they had in view. Other members concurred. It was not, however, stated under whose direction the protective works were to be carried out.

### ILLUSTRATIONS.

LA FRANCE SOUS LES CAPETIENS LES VALOIS ET LES BOURBONS..

FACTORY FOR THE BRITISH URALITE CO., LIMITED, ERECTED AT HIGHAM.

CATHEDRAL S: RIFS..HEREFORD: VIEW FROM NORTH-WEST..



## BAYHAM ABBEY AND SCOTNEY CASTLE.\*

ROBERT BURNS has told us that the best laid schemes of mice and men gang aft agley, and it has happened so with us, or at the present time we should have been in the vicinity of Leeds Castle. But Leeds was a large barony, and it curiously happens that most of the ground we have traversed to-day formed one of its limbs. At Leeds and at Hollingbourne the Culpepers were important men, and the story of Lamberhurst and Pembury is more or less associated with them.

One writer spoke of the ubiquitous Culpepers, and John Philpot, who was Somerset Herald in 1657, when editing Camden's "Remaines," wrote:—"I have noted at one time there were twelve knights and baronets alive of this house together." In his "Barons' Wars" Drayton wrote:—

And Culpeper, in silver arms enrailed,  
Bore thereupon a bloody bend enrailed.

Enrailed signifies that the edges of the bend or band were indented or serrated. To-day Burke and Debrett know them not, and their arms are only seen on the old memorials in village churches.

Lamberhurst is partly in Kent and partly in Sussex, the counties being separated by the little river Tyse, or Teise, which is a branch of the Medway. Mark Antony Lower gives the derivation as Lambru, the Anglo-Saxon for lambs, and Hyrst, a wood, suggesting that the pasture land was especially suited for lambs. Edward Hasted, however, associates it with the soft clay or loam.

The manor of Lamberhurst, forming part of the Leeds barony, originally belonged to the Chevequers. A portion of it was let to Sir Nicholas Lenham, who obtained a charter of free warren and other rights from Henry III. The Chidcrofts succeeded them, and as the Culpepers were then in possession

marriage to Sir John Hanby. From their only child, a daughter, it passed by marriage to John Chaplin, and by the marriage of his daughter it came to the possession of Edward Ayscough, who alienated it in the reign of George I. to William Morland. In the hands of the Morlands the manor remains, and the manor house, known as Court Lodge, which was built of materials from Scotney Castle, stands in the picturesque park, which has gradually grown round the village church.

The church is dedicated to St. Mary; the oldest portion is the Early English arch which separates the chancel from the Scotney chapel. The window at the east end is Perpendicular; the carved pulpit bears date 1630. A grand old yew tree adorns the garth on the south side. The vicarage, a handsome Elizabethan building, is a little to the north of the park gate.



BAYHAM ABBEY.

William Cobbett, in his "Rural Rides," describes Lamberhurst as "one of the most beautiful villages man ever set his eyes upon," and to-day we have seen it at the most favourable season of the year. As a manufactory it has played its part, for here was the most important of the Sussex ironworks. Princess Anne, daughter of James II., visited it with her little son, William Duke of Gloucester, and in his honour it was named the Gloucester Furnace. The old balustrades for St. Paul's Cathedral we may believe to have been cast there, though for the furnace at Mayfield the honour is claimed. The weight of the railings was stated to be 200 tons, and they cost 11,202*l*. Less pleasant is it to note that cannon were also cast there, and many of them were smuggled across the channel to be used against the English by the French privateers. Some incidents of the Boer war have shown us how history repeats itself. The furnace is now represented by part of the foundry walls, a cottage which was formerly the counting-house, and the pond.



SCOTNEY CASTLE.

of the Leeds barony, the Chidcrofts assumed their arms, an old-time custom that was not at all unusual. The other part of the manor in the reign of King John was held from the Chevequers at half a knight's fee by Nicholas de Kenneth, who gave it to the Abbat and Convent of Robertsbridge. Hugo de Chevequer confirmed the gift, and received from the Abbat 35 silver marks. Many disputes arose between the Archbishop of Canterbury and the Abbat, but their differences were finally settled in 1216, though to this day the church is in the diocese of Canterbury, while the living is in the gift of the Dean and Chapter of Rochester. At the Dissolution the manor was granted by Henry VIII. to Sir William Sidney and Anne, his wife. Sir William was buried at Penshurst. In the reign of James I. the property was alienated to John Porter, and by Elizabeth Porter, the last of the line, it was conveyed by

\*. A paper by Mr. Harradence, read before the members of the Upper Norwood Athenæum.

George Alexander Cooke, writing of Scotney Castle, stated that "it borrowed its appellation from its local situation and overshooting of the water." The word Scotch has various meanings; one is to cut with shallow incisions, and the devious course of the Bewle may probably have suggested the name. Skotos is also a Greek word signifying darkness, and here may have been one of the densest and darkest parts of the forest.



The castle, according to Edward Horsfield, was built in the time of Stephen, and probably it was strengthened during the barons' wars. In the reign of Henry III. it was held by Walter de Scoteni. Edward de Hadenham has recorded how Walter was accused of administering poison to Edward Duke of Gloucester and his brother, William de Clare. For the offence he was tried, and found guilty, and after being drawn through the streets of the city of Winchester he was there hanged. The Scotneys died out about the middle of the reign of Edward III., and the property passed to the Ashburnhams. Roger Ashburnham, who resided there, was a Conservator of the Peace, and by permission of Richard II. he was permitted to further fortify the castle. By one of his successors it was alienated to Henry Crichley, Archbishop of Canterbury, and one of his mandates was dated Scoteneye, April 3, 1418. He gave it to his niece, Florence Crichley, as a dower on her marriage with Joseph Darrell, of Cale Hill, and in the possession of the Darrells it remained until in 1774 it was alienated to John Richards, who sold it to Edward Hussey. The old castle had four round towers; one only remains. The machicolations can still be seen. Two uprights of the gatehouse also remain, and the entire moat. A later house was built by Inigo Jones, and the present mansion, built by Salvin, is the residence of Mr. E. W. Hussey, by whose kind permission we visited the ruins.

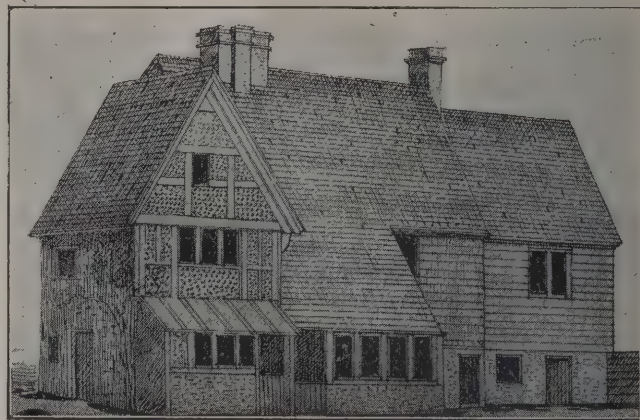
Bayham Abbey is situate in the parish of Lamberhurst. It has been variously known as Beaulieu, Bageham, Beigham and Bayham, from the beautiful spot on which it was reared. A stone tablet, among other particulars, tells us that "Ela de Sackville, daughter of Ralph de Dene, founded this Priore in honovr of St. Marie in the reign of K. Richard ye First." The owner of the land was Sir Richard de Thornham, who fought with King Richard in the Holy Land, and returning to England, placed Beaulieu at the disposal of the Premonstratensian canons. This order was founded in 1120 by St. Norbert, Archbishop of Magdeburg, and was much stricter than the rule of St. Austin, of which it was a branch. Their first settlement was at Pré Monré, and in 1140 they made their way to Lincolnshire, where they erected an abbey known as Newhouse. They wore a white cassock, a rochet and a white cloak, and were generally termed the White Canons. Other houses were established by them at Brockley and Otham, but the land there was so poor that the monks vacated their quarters, and the Brockley canons joining them, the beautiful abbey of Bayham was reared. Mr. A. J. Beresford-Hope writing of them said "they were a strict sect, who wanted no congregations and cared for no processions, so they built their church like a long room." From east to west Bayham measured 257 feet, the width being 24 feet. The choir was extended into the



SCOTNEY CASTLE.

nave, so that with the transepts and chancel it formed a cross. The string-course in the western portion of the choir shows where the stalls of the canons terminated. The eastern limb of the cross is unusually short and it terminates with a trigonal apse, a particularly rare feature. A gracefully-designed and beautifully-executed cluster of foliage in the nave tells of the loving labour that was given to the church. There were no aisles and the doorways on the north and south sides were formed to communicate with the transept by passages. In each transept there were two eastern chapels, and those on the north side still retain their vaulting. Two other chapels were on the south side between the nave and the chapter-house, which had three aisles. Some of the penitential cells, the gatehouse and a stone coffin with a sculptured cross still remain. Dugdale only tells of six of the abbats—Robert Frendesbury, 1405; John, 1413; Thomas Cottingham, 1475; Robert Hertley, 1478; Robert Nash, 1488; and Richard Bexley, 1494. Though the ordinary public were not admitted

to the abbey, pilgrims were ever welcome, and among the distinguished visitors was Edward I., who was entertained in 1299, and Edward II., in 1324. Richard, the sainted Bishop of Chichester, was also one of their guests, and the bed he slept on was long celebrated for its healing power. The strictness of the monks seems to have gradually slackened, for when Bishop Redman visited them in 1488 he complained that they were holding cures and were wearing "pykes" to their shoes like fops. They were popular with the neighbouring peasantry, however, for when Henry VIII. handed over the abbey to assist Cardinal Wolsey in founding his colleges at Oxford and Ipswich, the people defended the monks and carried them back to the abbey from which they had been expelled. For this act the Abbat and canons were arrested and their protectors were punished. Wolsey's fall soon followed, and as the colleges were not fully founded Henry claimed Bayham. By Elizabeth it was granted to Anthony Brown, Viscount Montague, and his descendant Ambrose Brown sold it in 1714 to John Pratt, who became Lord Chief Justice. While in his possession the roof of the abbey was removed for



SHOP, LAMBERHURST.

the sake of the materials. His son Charles, on July 17, 1765, was raised to the peerage by the title of Lord Camden of Camden Place, co. Kent. In 1766 he was appointed Lord High Chancellor of Great Britain, and on May 13, 1786, he was advanced to a viscounty and earldom by the titles of Viscount Bayham of Bayham Abbey, and Earl Camden. His son, John Jeffreys Pratt, was the second earl, and on September 7, 1812, he was created Earl of Brecknock and Marquess of Camden. By the third marquess the present mansion was built, and as a memorial to his father he erected the little church. The earlier mansion stands on the low ground west of the abbey church, and was built from the materials of the demolished abbey. It is now the residence of the Rev. J. H. Savory, chaplain to the marquess. By permission of the fourth marquess we were permitted to visit the ruins to-day.

No historian of the county, or philologist, so far as my search has extended, has hazarded a suggestion regarding the meaning of Pembury. But when we note that in the Textus Roffensis it is called Peppingeberia, and in ancient deeds Pepenbury, the thought arises that it may have had something to do with the Culpepers, who had their home there at Bay Hall. The church, dedicated to St. Peter, originally paid ninepence a year to the cathedral at Rochester, which was termed chrim rent. Pembury with other manors was bestowed on the Abbat of Bergham by Simon de Wahull, on condition that one canon celebrated mass there daily, and he bequeathed his body to be buried in the abbey church. By his bull, dated November 10, 1239, Pope Gregory IX granted license to the Abbat of Bayham to hold the church. Richard Oliver, the rector, declined to give up possession, and not until 1278 was the Abbat inducted. In the twenty-eighth year of King Edward II. John Culpeper was granted permission to build a chantry chapel, dedicated to St. Mary, in the churchyard, and in the reign of Edward III. he is believed to have rebuilt the church. On the three buttresses on the south side of the chancel are three shields—the first bears a rectangular cross, the second has the Culpeper arms, and the third has the arms of his wife's family, the Hardreshulls. An old stone of the chancel pavement has an inscription in old French to Margaret, daughter of Sir Thomas Coleperer, who died in the reign of Edward III. The churchyard contains the stone coffin of an Abbat of Bayham. At the Dissolution the manor was claimed by Henry VIII., who gave it to Sir Edward Guildford, knight, Warden of the Cinque Ports. The next owner of importance was Sir Thomas Cromwell, knight, who was made Earl of Essex, Knight of the Garter, and Lord High Chamberlain of England. The Marquess Camden is now the chief landowner.



In addition to the authorities I have quoted, I am indebted to the ordinary county guides, and to various articles by Edward F. Skinner, George Measom, George F. Chambers, W. Stanley Martin, B. Prescott Row, Mackenzie Walcott, E. R. Kelly and other writers.

I have to gratefully acknowledge the kind and continuous co-operation of Mr. Stanley, and though you may consider we are somewhat to blame for arranging a ride instead of a ramble, I think you will acknowledge we have partly atoned for it by giving you a very rambling paper.

The illustrations are from photographs by Messrs. H. G. Quartermain, Henry Virgoe, and Charles Wheeler.

## ANCIENT BUILDINGS IN OR NEAR NEWCASTLE-ON-TYNE.

ON to-morrow (Saturday) the annual excursion of the members of the Northern Architectural Association will take place. They will travel by train to Morpeth, and then drive to Brinkburn Priory. They will next proceed to Craig-side. Afterwards the memorial chancel fittings in Rothbury Church will be inspected, before returning to Morpeth for dinner.

A very useful list of ancient buildings near Newcastle-on-Tyne has been compiled by Mr. F. W. Morgan. Copies have been presented to the Association by Mr. J. W. Taylor, with the hope that they will encourage students to study the buildings referred to. In order to extend the utility of the list, and carry out the donor's intention, we reprint it, with the desire that other societies will endeavour to impart similar information.

### *Roman.*

The Roman Wall and Stations.  
Bridge abutment at Chollerford. Pillars placed in the nave arcade of Chollerton Church.

Stations at South Shields, Lanchester, Ebchester and Binchester.

Arch and stones in Corbridge Church.  
The Collection at The Chesters, Chollerford.  
Incised and Sculptured Stones, Hexham Abbey.  
Relics in the Black Gate Museum and in the Castle Keep, Newcastle-on-Tyne.

Altars and Inscribed Stones in the Dean and Chapter Library, Durham.

### *Pre-Conquest.*

The Towers of Ovingham, Corbridge, Bywell (St. Andrew's), Whittingham, Warden and Billingham Churches.

The Crypt at Hexham and the Church at Escomb (complete).

Tower and west wall of nave, Monkwearmouth Church.  
Jarrow Church tower and chancel  
Portions of Bolam, Whalton, Woodhorn, Heddon-on-the-Wall, Hart, Staindrop and Sockburn Churches.

The tower and transepts of Norton Church.  
The Frith Stool at Hexham, Two Crosses in Ayckley churchyard.

Crosses and Sculptured Stones in the Dean and Chapter Library at Durham.

### *Norman.*

Durham Castle, chapel, 1071-96; doorway of Bp. Pudsey's lower hall and Bp. Pudsey's upper hall.

Durham Cathedral, choir and aisles, 1093-96; nave and aisles, 1099-1128; Galilee chapel, circa 1175.

Edlingham Church, nave arcade, chancel arch, south door, &c.

Edmundbyers Church, Choir of Coldingham (late).  
Brainshaugh Chapel, Acklington.

St. Andrew's Church, Newcastle, lower stages of tower, part of nave arcades and chancel arch, 1175-85.

Ponteland Church, west doorway and lower stages of the tower.

Heddon-on-the-Wall Church (chancel), and parts of Rock Church.

Newburn Church tower (early), and Whickham Church nave arcade.

Warkworth Church, chancel and greater portion of the nave.

The Keep of the Castle, Newcastle (the whole, with the exception of the modern battlements).

Bamburgh Castle Keep (latter part Henry I.), most of Barnard Castle and part of Alnwick Castle.

Naves of Mitford Church and St. Margaret's, Durham.

Parts of Brinkburn Priory (Transitional), Prudhoe Castle, and the oldest parts of St. Mary's Chapel, Jesmond.

Corbridge Church, south aisle (temp. Henry I.).  
Elvet Bridge, Durham (end of twelfth).

Pittington Church, arcade of nave. Part of Tynemouth Priory.

Bellingham Church (end of eleventh century), and chancel of St. Cuthbert's, Haydon Bridge, circa 1190.

The whole of Lindisfarne Priory and Seaton Delaval Chapel.

Portions of St. John's, Newcastle; St. Mary's, Gateshead; St. Giles, Durham, and Barnard Castle Church.

Parts of Seaham and Lanchester Churches.  
Ebchester Church (latter part of the eleventh century).

The great hall (formerly chapel), Auckland Castle, c. 1185.

Darlington Church (end of twelfth or beginning of thirteenth centuries).

Hartlepool Church (c. 1190).  
Eryholme Church arcade (c. 1200).

Transitional  
or  
Pointed  
Work.

### *Thirteenth Century.*

The lower part of the Black Gate, Newcastle, 1247.  
Parts of the Black Friars Monastery and "King John's Palace," Newcastle-on-Tyne.

Hexham Abbey, the whole of (Transitional and Early English).

Durham Cathedral, upper part of the western towers, c. 1220. Chapel of the Nine Altars, 1242-70.

Substantially the whole of Ryton (early), Simonburn, Houghton-le-Spring (first half of century), Sedgfield (all but tower), 1225-50, and St. Andrew's, Auckland (early), Dalton, Easington (except the tower) and Whitburn Churches.

Greater parts of Tynemouth Priory, 1220; Blanchland Abbey Church; Finchale Abbey and Brinkburn Priory.

Transepts of Ponteland Church, and Chancels of Mitford and Corbridge Churches.

Large portions of Ovingham, Medomsley, Chester-le-Street and Holy Island Churches.

Haughton Castle (Ed. I.), Aydon Castle (c. 1250) and the old Tower at Ford (1287).

Tower and Spire of Boldon Church (early thirteenth).  
St. Edmund's Chapel (Holy Trinity Church), Gateshead, complete 1241-48; restored, 1837.

The Town Walls of Newcastle, with the towers (Herber Croft and Corner), thirteenth, fourteenth centuries.

Parts of Hartburn, Whalton, Lanchester (chancel, early thirteenth); Bamburgh, Brancepeth (tower and part of nave, circa 1240); Bywell (2) and Chester-le-Street Churches.

The Lavatory at Hexham Abbey, circa 1280.  
The Great Hall of Durham Castle (late thirteenth).

Staindrop Church Sedilia.  
Parts of Prudhoe, Halton and Ravensworth Castles.

Vicar's Pele Tower, Corbridge Churchyard.

### *Fourteenth Century.*

St. Nicholas, Newcastle, nave and chancel arcades, s. wall recesses and windows, some of the s. transept windows and the crypt.

St. Andrew's, Newcastle, upper stage of tower.  
St. John's, Newcastle, nave arcade and s. aisle.

St. Mary's, Gateshead, nave arcade, c. 1350.  
Belsay Castle (complete, temp. Ed. III.) and part of Ogle Castle.

Ponteland Church, Chancel, c. 1330. Warkworth Hermitage, c. 1340.

Spire of Warkworth Church. Ovingham Church porch.  
Hexham Moot Hall and Manorial Office.

Etal Castle and Edlingham Castle.  
Hunwick Manor House Chapel.

Large portions of Newbiggin and Morpeth Churches.  
Pele Towers at Corbridge and Cocklaw (both early fourteenth).

Brancepeth Church, aisles and transepts, chancel, chape and vestry, circa 1375; and the chest.

The greater part of the work at Alnwick and Raby Castle  
Morpeth Castle (gateway tower) and Dilston Tower.

Langley Castle, c. 1350; the old work at Chillingham Castle, and Halton Tower.

Chester-le-Street Church, octagon and spire (Early Decorated); spire of Coniscliffe Church.

Durham Cathedral, several windows; Bp. Hatfield's tomb and Bishop's Throne, c. 1375.

Durham Cathedral, tomb of John Lord Neville, 1386; Altar Screen, 1374-80.

Durham Cathedral, kitchen of the monastery, 1368-70.  
Bothal Castle, c. 1343. Bothal Church.

Lumley Castle (greater part of), end of fourteenth century.  
Dunstanburgh Castle, 1316-25.

Friarside Chapel, Rowlands Gill. Chantry Chapel, Tynemouth Priory, c. 1335.

Darlington Church, higher stage of the tower and the spire.  
Framwellgate Bridge, Durham; Chester-le-Street and Warkworth Bridges.

Chantry Chapel, St. Cuthbert's Church, Haydon Bridge.  
The Tower of Chipchase Castle, c. 1350.

### *Fifteenth Century.*

Beltingham Chapel, Haltwhistle (complete); Bywell (St. Peter's), lady chapel.



Gateway towers of Bywell Castle and Alnwick Abbey.  
 Hilton Castle, c. 1415. Warkworth Castle (largely).  
 Warkworth Church, s. aisle and porch. St. Michael's  
 Church, Alnwick (nearly all).  
 Sedgfield Church tower, 1425-50. Durham Cathedral,  
 centre tower, 1430-90.  
 St. Nicholas, Newcastle, tower and steeple, and the roofs,  
 c. 1450.  
 St. John's, Newcastle, tower vault and roof.  
 All Saints, Newcastle, Thornton brass, 1429.  
 The Stallwork in Jarrow Church, 1494-1519. The Fonts in  
 St. Nicholas, Newcastle, and Hart Churches.  
 Greater parts of Witton Castle, near Bishop Auckland, and  
 Lumley Castle (early).  
 Cockle Park Tower. The Bridge at Felton.  
 Tomb of Lord Ralph Neville in Staindrop Church.  
 Chancel of the Chapel, Hilton Castle. Part of Hulne  
 Abbey.  
 Brancepeth Church, oak panels of screenwork.  
 Durham Castle, kitchen and buttery, 1494-1501.  
 Oak ceiling in the Priors' apartments (Deanery), Durham.  
 The Rood Screen, c. 1500, Hexham. The Leshman  
 Chantry, Hexham.  
 Gateshead, St. Mary's, nave, roof and north transept.

#### *Sixteenth Century.*

Abbey Gateway, Durham, 1494-1519.  
 Durham Castle, Bp. Tunstall's gallery, woodwork and  
 chapel.  
 Durham Castle, stalls in the chapel, 1509-22.  
 Durham Castle, tapestry (late) in galleries and rooms.  
 Portion of Auckland Castle; transepts of Hilton Castle  
 Chapel.  
 Two or three old houses at West Auckland.  
 Stella Hall, Blaydon. Denton Hall, c. 1503. Horden Hall.  
 Font covers in St. Nicholas, St. John and St. Andrew's,  
 Newcastle.  
 The old Grammar School, Durham, 1541.  
 Old house on "The Bank" at Barnard Castle.  
 The Henry Neville monument, Staindrop. The older parts  
 of Ryton Rectory.  
 Pulpit, Heighington Church.

#### *Seventeenth Century.*

Pulpit in St. John's Church, Newcastle (early).  
 Brancepeth Church, Bp. Cosin's woodwork (early), and the  
 porch.  
 Durham Castle (fireplace in Senate room, 1606-17; Black  
 staircase, 1665); fireplace in keep, Newcastle.  
 Upper part of the Black Gate, Newcastle, 1603-20.  
 Gibside Hall (temp. Jas. I.), Chipchase Castle, 1621. Helm-  
 ington Hall and parts of Hunwick Hall.  
 Welton Pele Tower and part of Dilston Castle.  
 Maddison and Hall Monuments in St. Nicholas, Newcastle,  
 1635-40.  
 Gateshead, St. Mary's, nave stalls, 1634; stalls in chancel,  
 1695.  
 Mifford Manor House, 1637. Hexham Grammar School,  
 1684.  
 Durham Cathedral, choir stalls and canopy of font, c. 1671.  
 Parts of Ogle (temp. Charles I.) and Halton Castles.  
 Chillingham Castle. Late alterations by Inigo Jones.  
 Blackbird Inn, Ponteland. Wallington Hall (late).  
 The Guildhall and its Mayor's Chamber and Merchant's  
 Court, Newcastle.  
 Cox's House, Quayside, and Cross House, Westgate Road,  
 Newcastle.  
 Old Houses in the Side, Sandhill, Bigg Market and Old  
 Pilgrim Street (with staircases, fireplaces, panelling, &c.), New-  
 castle.  
 Fittings in the Chapel of the Trinity House, 1634, New-  
 castle.  
 Brass Lectern in St. Nicholas. The Jesus Hospital, 1683.  
 The Smiths' Hall, 1679, Newcastle.  
 Bp. Cosin's Library, Durham, 1669.  
 Old Houses at Newburn, Corbridge, Hexham, Washington,  
 Tynemouth, Hunwick, Houghton-le-Spring, Hartlepool, Gain-  
 ford, and many other places.  
 Chancel stalls, Ryton.  
 Pulpit, reading-desk, &c., Haughton-le-Skerne Church.

#### *Eighteenth Century.*

Tanfield Hall and iron gates.  
 Ryton Rectory, 1700. Seaton Delaval Hall (by Sir John  
 Vanbrugh), 1707.  
 West Boldon Hall, 1709. Heworth Old Hall.  
 Chipchase Castle (north side).  
 Newcastle-on-Tyne :—  
 Keelmen's Hospital, 1701. Trinity House Hall, 1721.  
 Heaton Hall, 1713. Buildings in the Swirle.

Liberal Club (old Queen's Head), and interior of the  
 Guardians' Offices, Pilgrim Street.  
 Vestry of St. Nicholas, 1736. Porch of St. Andrew's.  
 All Saints Church (by Stephenson), 1786-96. St. Anne's,  
 1768.  
 The Guildhall front. Old Assembly Rooms, 1774-76.  
 Jesmond Manor House, 1721. Fenham Hall.  
 Gosforth House, 1760, by Payne, and No. 55 Westgate  
 Road.  
 Tower of St. Mary's, Gateshead, 1739-40.  
 South Shields (1768), Stockton, Alnwick and Barnard  
 Castles (1747), Town Halls.  
 Sir John Vanbrugh's work at Lumley and Hilton Castles.  
 Upper parts of the Croft and Carpenter's Towers, New-  
 castle.  
 Old houses at Durham, Sunderland, Cleadon, Westoe,  
 Seaton Sluice, Morpeth, Warkworth, Hexham and several  
 other places.

### ARCHITECTURE AND THE UNIVERSITY SYSTEM.

A ROYAL Commission was appointed last year "to inquire into the present condition of the higher, general and technical education available in Ireland outside Trinity College, Dublin, and to report as to what reforms, if any, are desirable in order to render that education adequate to the needs of the Irish people." The official report of the evidence has appeared. Among the witnesses who gave evidence were Sir Thomas Drew, P.R.H.A., and Mr. Arthur Hill, B.E. We reprint Mr. Hill's evidence :—

Mr. Justice Madden: Mr. Hill, you are lecturer in architecture in the Queen's College, Cork?—Yes.

You are a member of the Royal Irish Academy and some other learned bodies?—Yes, of the Royal Institute of British Architects, and a life student of the Royal Academy of London.

What place does the study of architecture occupy in the Queen's College, Cork?—The lectureship was created by the Council, without any powers of appropriation of salary or making of any other arrangements. I lectured for two years, in 1894 and 1895. The third year, the number of bona-fide students presenting themselves was very small—only two or three at most—and it was not worth while carrying on the lectures for these students, because they got no credit for it in their examinations. One could not ask students to give up their work in the engineering course, where their responsibilities lay, to study a subject for which they could get no credit.

These were engineering students as a rule?—As a rule, and one or two who attended the course were men who were studying architecture—architects' assistants.

The study of architecture forms no part of the curriculum?—Except on paper.

How do you mean on paper?—It is included in the prospectus of the college.

Are students examined in architecture?—There is an examination in architecture which forms part of the first or second year's course in engineering, and that is carried out by the professor of engineering.

You are prepared to offer us some suggestions as to the position which you think should be occupied by the study of architecture and the profession in architecture in a university system?—Many years ago, when I took my degree in the Queen's College, Cork, and then went to London, I found that the young man studying architecture had absolutely no systematic course of study. I wrote a paper at the time, which was read at a conference of architects held in London in 1874. It was called "College Training for Architects." My proposal was that the architect should be put on much the same footing as the engineer in the university. There should be a professor of architecture in every university where there is a school of engineering. The two professions should run together. It would certainly improve our engineers. Some higher idea of a sense of beauty would be no harm to them, and the association of the artistic temperament of the architect with the practical work of the engineer would be a benefit to architects; and there is no reason why the two professions could not be worked together in that way. The condition of affairs is this. In 1887 the Royal Institute of British Architects, as representing the profession, considered that an educational standard was necessary for the profession. They got a new charter at that time, and the charter conferred the power of holding examinations. In 1887 they then decided that every associate should pass a series of examinations extending over three years. Out of the associates the fellows are elected, so that at the present moment, so far as membership of the Royal Institute of British Architects is concerned, the gate is closed. Nobody can become a member of the Society who has not passed the three consecutive examinations. The Institute has decided what they think an architect should know. There have been some criticisms. I got a letter this morning from



Professor Simpson, of Liverpool, saying that, in his opinion, the education should have been provided first, while entirely agreeing with the principle that education should precede examination. I don't think that is a fair view to take, because if the Institute had not decided what an architect should know, we would be now as we were thirty years ago. I think the complaint is that the State has not accepted what the profession has declared to be necessary, and provided the necessary education, instead of leaving it entirely to voluntary effort.

Where are the examinations held?—In London or in any part of the provinces where students present themselves. The Architectural Association of London is a junior body which exists almost for the purpose of mutual aid in education, and when the Institute started these examinations the Association commenced classes. These classes have been carried on altogether out of their own pocket. They are principally night classes, but this year they have launched out a little further and have established day classes. That is the curriculum of the Association, so that the Association voluntarily tries to do what it can to furnish young men with a system of education. There are in London, of course, other classes designed for architects. There is a course of architecture in University College, but it consists simply in the history of architecture and a course in building construction, which are very well so far as they go, but incomplete. There are courses in King's College; but I think I might sum up the general professional feeling towards these classes as this: that they are inadequate. Recently a school of architecture has been developed in the Liverpool University, I believe, by private effort altogether.

Is that the only University College in the United Kingdom that confers a degree in architecture?—That is the only University College where they have commenced to give this degree for the first time.

That is the degree of Victoria University, of which the Liverpool University College forms a branch?—Yes; it is only in Liverpool that this degree can be got, because that is the only one of the three colleges that has got an architectural school.

But no university degree is conferred in architecture except through the University College of Liverpool?—Yes. Here is a prospectus of the Liverpool College (*handing it in*)\*

The London University confers no degree in architecture. Is that so?—There is no degree in architecture.

But there is a course of training. Does the training in University College, London, form part of the curriculum for a diploma in engineering, or is it separate?—In King's College they give a "college certificate" in architecture and the associateship of the college (A.K.C.).

Professor Dickey: Does the new London University not give a degree?—No.

Is it not in contemplation?—It is, I believe, in contemplation; but the R.I.B.A. is not well satisfied with the position of affairs. The Gresham Commission proposed architecture as an independent faculty, but the result of the late formulating of the scheme has been to leave out "architecture" altogether from the various faculties, and it is supposed to be included either in the faculty of science or engineering.

Mr. Justice Madden: Your suggestion is that in a properly constituted university system there should be a separate faculty of architecture, with a corresponding degree, and a school and professors in which and by whom architecture should be taught?—Precisely; on the plan of the American Universities.

Are there separate degrees?—The degree is Bachelor of Science, and that is given for all the branches; but you can take it either in mining, engineering or architecture.

You can specialise?—Yes; at Massachusetts there are nearly 100 students in architecture at the present moment, where they pursue a four years' course. They have passed or given degrees to 176 since they opened in 1873, including half a dozen ladies.

Would your idea be that the students should matriculate in a university and pursue an arts course up to a certain point, and then specialise?—The course at Liverpool seems very nearly as it should be. A student must matriculate in the usual way. He must then take arts subjects, and at the same time take up some portion of the architectural course in the first year. The second and third years are devoted entirely to work in the architectural school.

Most Rev. Dr. Healy: But he specialises to some extent, even in the first year?—Yes. The Liverpool school is, I think, a little deficient in science, but, as Mr. Simpson says, you cannot do everything at once. Of course, the difficulty in an architect's training is this: so to adjust science and art that a student gets fairly trained in both. Afterwards he may specialise, and one may become more of a constructor and another more devoted to the artistic side of the work, but it is of great importance that these two faculties should be trained

together. The great object of the training should be to enable the student to understand the true relationship of science and art to architecture.

Mr. Justice Madden: Supposing that there were a separate school leading up to a degree, what do you suggest as to the course of training prescribed—what should it include?—It should include, in the first instance, a certain amount of general culture, the elements of an arts course. It should then include drawing, pure and simple; painting, modelling, and everything of that kind. It should include a special study of the history of architecture, because it is only by a review of the finest works that man has produced that the taste of the student can be formed and elevated. The subject of the history of architecture should not be approached from a purely archaeological point of view, but should also be treated so as to show how architecture developed. I believe that in that way what we are all seeking for at the present day, a new style, is more likely to arise than by mere copying. The science should be treated from the constructional point of view, and should be taught, of course, by a specialist.

Has your attention been called to the syllabus of the courses in the department of Architecture and Construction set forth by the University College of London?—Yes.

In a general way, does that agree with your views?—In a general way; but it is deficient in the necessity for an arts course.

Are there any other remarks that you wish to bring before us?—My chief point is to bring before you simply the needs of the profession. I think the examination system of the Institute shows that it is of importance to bring before the State and before the public the need of the profession in regard to education. It is all very well for the Institute to say what they require, but it is the duty of the State to work up to, and to supply what the profession requires.

Do any considerable number of fully-qualified architects under the Institute hold University degrees?—A very small proportion, for the simple reason that very few men can afford the time. If a man goes for an ordinary arts degree, that gives him enough to do for two or three years and postpones his studying for his profession.

But if the status of a degree qualifying as an architect acquired by studying in a university were given, I suppose you are of opinion that it would tend to elevate the profession greatly?—Certainly.

Because there would be an element of liberal education introduced outside the mere professional training?—Yes. There has been an effort made before Parliament two or three times during the last few years to get a system of registration for architects legalised. A certain number of men think that would be a panacea for all the ills of the profession; but other men are of quite an opposite opinion. If Parliament were to organise an arrangement of that sort every man who ever designed anything, however humble—a builder's clerk who had designed a labourer's cottage for a Board of Guardians—could demand to be registered as an architect under the Act of Parliament.

Is it called a diploma or a certificate what is given by the Institute?—It is only an admission to the Associateship.

Most Rev. Dr. Healy: And the Fellowships?—The Fellowships afterwards follow from the Associateship. A man must be an Associate for five years before being eligible for a Fellowship.

Mr. Justice Madden: What proportion of those who are employed as architects in Ireland have that qualification?—You mean being members of the Institute?

Yes.—In Ireland I should say there are very few. I really could not name one who has taken the Institute examination. There may be some in Dublin and Belfast.\*

There are no qualifications legally necessary to constitute an architect?—No.

It differs in that respect from other professions; but what is the usual educational qualification of an architect?—Well, it depends upon the individual's standard. With some men it is just their name on a brass plate. That is what we complain of.

Probably you would answer that, as the universities have not recognised it as a separate school it is very difficult to define what is the qualification of an architect?—That is so. There are no opportunities for young men to study architecture, except in Liverpool. I have sent my son to Liverpool within the last few months, simply on account of the facilities for study there. There are some men in London who go to King's College, or to the Association school. They get

\* "I have just received a list of the students who have passed their entrance examination for the R.I.B.A., December 1901:—R.I.B.A. Examinations—Preliminary—151 passed (including two Irish students from Cork); Intermediate—45 passed (including one student from Belfast); Final—35 passed (no record of an Irish student)." Arthur Hill, December 11, 1901.

\* Prospectus of Day Classes in Arts, Science and Law for the session 1901-2, in University College, Liverpool. University Press of Liverpool, 1901, page 154.



education there, but they get no qualification—no stamp of a degree from it.

Professor Dickey: Liverpool is the only place where they can get a degree?—The only place in the United Kingdom. The degree was only created last year.

Most Rev. Dr. Healy: How would you propose for Ireland that degrees should be given in architecture? Would it be the degree of Bachelor of Science?—That is as it may be. So long as some mark is given I would not care; but Bachelor of Science probably would be the best. There is a Bachelor of Science degree given in America.

You are aware that in the Royal University the first year's course is not special or professional in any way; it is a general arts programme. Would you be in favour of that for architects?—Certainly.

It would be time enough to specialise at the end of the first year?—Certainly. The point I wish to put is this. The education of the architect should begin from the University course. In a few years you would have a body of really educated architects, and the public would then discriminate.

Professor Lorrain Smith: You intend to lead the public to discriminate, and not to have legal restrictions?—I do not believe in legal restrictions, such as registration. That would be beginning from below, and every man who practises, no matter what his standing, would be legally qualified to rank as an architect.

What number of students would there be in the faculty—what number would you naturally expect?—I do not suppose I would expect from Cork more than a half dozen.

Dr. Starkie: How many are there at present?—In the engineering school there are about sixteen or eighteen at present.

Professor Lorrain Smith: That is one side of the engineering school. You would contemplate an all round faculty giving a degree in architecture?—Yes. Cork is a very small place; and my scheme is very much broader than for Cork.

There are a large number of architects in Ireland?—Yes; a good number of them are in Dublin. There must be a large number here.

Do you happen to know in what the Liverpool School of Architecture originated?—I think it was at the instance of some private person or body.

Was it the architects of Liverpool asked for it?—I don't know exactly how it sprang up.

Professor Dickey: There are two ways in which architecture might be provided for: by education in a university, or in a technological institution such as in Manchester. You prefer the university?—I prefer the university for two or three reasons. In the first place, a technical school does not aim at general culture, and in the next place the aim of a technical school is to give the artisan who has the use of his hands or his tools as much science as he can take. That is not at all the training for an architect. An architect need not be a craftsman. It is not necessary for an architect to be able to play billiards in order to design a billiard-room, but he must know the size of the table and the length of the cue. It is not necessary that he should be able to take the tool out of a plumber's hands and solder a joint; but he should know the theory of these things. I think the subject would be better approached in a university than in a technical school.

You think it should be associated with engineering?—Yes; engineering as taught in a university.

Would you practically make it part of the engineering faculty, and make every bachelor of engineering study architecture, and every architect acquaint himself with the principles of engineering?—Certainly; the two professions should be worked together and taught together up to a certain point; but time is a consideration in the subject, and you could not expect an architect to spend a great deal of his time studying the higher mathematics, perhaps more or less distasteful to his temperament, nor would you oblige an engineer to study painting and drawing until he got sick of the whole subject. There must be specialisation.

But the architect of the highest type would, in your opinion, be produced by the university?—Yes. University training should produce a man of general culture, a scientific attitude of mind, and with his artistic temperament developed. He should know so much about all subjects as to be able to control those under him. Take, for instance, these modern American buildings of steel. They require an amount of calculation that an architect need not necessarily do himself, but he should know enough about them to be able to control the man whom he employs to make them.

You have visited Belfast and Derry?—I have. In my opinion the whole country should be afforded facilities in this respect.

Are there some buildings in Belfast which show a lack of architectural science on the part of local architects?—I don't know about that; but in Liverpool recently I happened to see a building of most charming design, but all the mouldings in front were run without any regard to the stone joints. That

design was made by some young draughtsman, and handed to the builder to carry out in any way he liked. The real spirit of architecture is that design should be based on construction.

Mr. Justice Madden: I think Mr. Ruskin has expounded that doctrine with great beauty of language and clearness in his "Seven Lamps of Architecture"?—Yes.

Most Rev. Dr. Healy: Are we really to understand—I am particularly anxious to know, it for my own information—that we cannot ascertain for certain that we are dealing with a qualified architect?—No; there is no means of ascertaining that. Young men simply start as architects, with or without education.

## DUNDEE INSTITUTE OF ARCHITECTURE.

THE annual meeting of this Institute was held on the 16th ult. The annual reports were approved, and reference was made to the death of Mr. J. J. Henderson, who for twelve years had been honorary secretary of the Institute. The following officers were elected:—President, Mr. A. A. Symon, Arbroath; vice-president, Mr. P. H. Thoms; members of Council, Messrs. G. A. Pyott, Charles Ower, William Farquharson and W. G. Anderson; honorary secretary, Mr. David L. Allan; hon. treasurer, Mr. Charles G. Soutar; auditors, Messrs. B. C. Douglas and J. D. Mills. The prizes in the Institute competition were awarded as follows:—Sketch Book—Mr. Stewart Kaye. Measured Drawing—Mr. John M. Fairweather; hon. mention, Mr. David Milne. Water-Colour Drawing—Mr. Alan Robertson. Design for Marine Hotel—Mr. David Milne; hon. mention, Mr. David Smith. Design for Farmhouse—Mr. Stewart Kaye; hon. mention, Mr. A. G. C. Nicholson. Design for Boat-house—Mr. Arthur Wilson; hon. mention, Mr. A. S. Robertson. Design for Summer-house—Mr. William Simpson.

## THE HELLENIC SOCIETY.

THE annual meeting of the Society for the Promotion of Hellenic Studies was held on Tuesday in the rooms of the Society of Antiquaries, Burlington House, Sir Richard Jebb, M.P., in the chair.

The report of the Council was read by Mr. H. B. Walters, the acting hon. secretary. It stated that during the session the work of the Society had been carried forward in its several departments with energy and effect. Three general meetings had been held, and had been well attended. It had for some time past been felt that the rooms of the Royal Asiatic Society were hardly adequate. Fortunately, the Council had been able to come to an arrangement with the Society of Antiquaries whereby in future all general meetings would be held in their excellent rooms in Burlington House. The Council had again made a grant, this time of 100l., to the Cretan Exploration Fund. By the aid of this fund Mr. Evans last year carried further his remarkable excavations on the site of Knossos, while Mr. Hogarth made some interesting discoveries at Kato Zakro. The response to the appeal issued by the managers of this fund last autumn was, unfortunately, so inadequate that it was found necessary to confine its operations during the present season to the work at Knossos upon which Mr. Evans had again been successfully engaged, though it was doubtful whether the funds now available would suffice for the completion of the excavations. Meanwhile another very promising Mycenaean site, at Palaeokastro, near Sitia, in Eastern Crete, which Mr. Hogarth had hoped to excavate under the auspices of the Cretan Exploration Fund, had been undertaken by the British School at Athens. A British School had now been established at Rome on much the same lines as the school at Athens. Satisfactory progress had been made with the facsimile of the Codex Venetus of Aristophanes, which was announced in last year's report. The facsimile itself was practically complete. Another special publication, which was announced last year, that of the report on the very important excavations undertaken by the British School at Athens on the site of Phylakopi, in the island of Melos, had also made good progress. The statistics of work done in the library again showed considerable progress. The number of visits paid to the library was 343, compared with 236 in 1900-10, and 190 in 1899-1900. On the other hand, there was a reduction in the number of members using the library, which was 66, compared with 81 and 70. The Council had decided that the time has now come when it was expedient to print the library catalogue. The Overbeck tracts (about 700 in number) described in the last report had been arranged and bound, and would be entered in the forthcoming catalogue. The purchases of the year included "Corpus Inscriptionum Atticarum," Tischbein, "Hamilton Vases." Also six volumes, which were wanting or imperfect in the Society's set of the "Revue Archéologique." The *Notizie degli Scavi* had been added to the list of periodicals. The year 1901-2 has been a period



of steady extension and increased use of the photographic collection. As to the present financial position, ordinary receipts during the year were 1,022*l.*, against 1,037*l.* during the financial year 1900-1. The receipts from subscriptions, including arrears, amounted to 641*l.*, against 646*l.*, and receipts from libraries, and for the purchase of back volumes 185*l.*, against 179*l.* Life subscriptions amounting to 78*l.*, donations 3*l.*, and for lantern slides 19*l.* had also been received. The ordinary expenditure for the year amounts to 665*l.*, against 716*l.* Forty-nine new members had been elected during the year, while thirty-seven had been lost by death or resignation. The present total of subscribing members was 759, and of honorary members twenty-five, the names of Professors Federico Halbherr and Adolf Wilhelm having been added to the roll of honorary members. Six new libraries had joined the list of subscribers and five had stopped payment, making the number at the present time 143, or with the five public libraries 148. The present year, like most of its predecessors, might be described as a prosperous, if uneventful one for the Society.

The Chairman, in moving the adoption of the report, referred to the loss sustained in the death of Mr. Alfred Benn, Mr. W. J. Stillman, the Bishop of Durham (Dr. Westcott) and Mr. C. J. Monk, the son of Bishop Monk, the biographer of Bentley.

The motion was seconded by Mr. Bikelas and carried.

Mr. Arthur Evans then gave a short account of his excavations in Crete. There were, he said, four distinct lines of walls of the Palace of Minos, made necessary, it might be, by successive inundations. He described the various chambers and frescoes and the complicated system of underground communication. A considerable number of very interesting frescoes—of the same school as those of Melos and Phylakopi—were also discovered. Many bits of naturalistic foliage and *filices* were found, and *dissecta membra* of sculptures of last year's discovery were successfully pieced together. Specimens of marvellous beauty came to light of early Minoan pottery—seal impressions of a primitive style, some with cryptographic inscriptions; clay tablets with the linear scrip developed from a pictorial prototype, and not derived from the earlier types hitherto known. The economic history of these ancient days was to some extent disclosed by a series of accounts. The excavations allowed an approximate reconstruction of a Minoan street, some of the houses being, as we should say, of a surprisingly modern character and displaying a highly-advanced civic development. The height of the houses enabled one to realise the description of the island as "hundred-cities Crete" and pointed to a congested population. The statuary was remarkable, and bronze wire was used for hair. In the eastern part of the palace was found a shrine of the later Mycenaean age of Knossos whereon were two stucco horns with sockets between them for a handle and near them cylindrical terra-cotta images. One of the most interesting discoveries was a wall design of elaborate mazes illustrative of the ancient traditions. His thanks were due to Mr. Mackenzie and Mr. Fyfe in the labours of reconstructing the remains of this ancient site and civilisation. Unfortunately funds were greatly needed. The results of the work were strikingly shown by pictures on the screen.

Mr. Carr Bosanquet, director of the British School at Athens, described briefly the work of the school on the east of the island, and the result pointed to Palæokastro as the chief town of this part of the island.

Mr. Evans and Mr. Bosanquet were heartily thanked for their interesting contributions.

## TESSERÆ.

### Artists as Interpreters of Nature.

THE soft suffusion of the soul, the speechless breathing eloquence, the looks "commercing with the skies," the ever-shifting forms of an eternal principle, that which is seen but for a moment, but dwells in the heart always, and is only seized as it passes by strong and secret sympathy, must be taught by nature and genius, not by rules or study. It is suggested by feeling, not by laborious microscopic inspection; in seeking for it without we lose the harmonious clue to it within; and in aiming to grasp the substance we let the very spirit of art evaporate. In a word, the objects of fine art are not the objects of sight, but as these last, are the objects of taste and imagination—that is, as they appeal to the sense of beauty, of pleasure and of power in the human breast, and are explained by that finer sense, and revealed in their inner structure to the eye in return. Nature is also a language. Objects, like words, have a meaning, and the true artist is the interpreter of this language, which he can only do by knowing its application to a thousand other objects in a thousand other situations. Thus the eye is too blind a guide of itself to distinguish between the warm or cold tone of a deep-blue sky, but another sense acts as a monitor to it and does not err.

The colour of the leaves in autumn would be nothing without the feeling that accompanies it, but it is that feeling that stamps them on the canvas, faded, seared, blighted, shrinking from the winter's flaw, and makes the sight as true as touch. The more ethereal, evanescent, more refined and sublime part of art is the seeing nature through the medium of sentiment and passion, as each object is a symbol of the affections and a link in the chain of our endless being.

### Joseph Wilton, R.A.

Among those lucky artists who, with humble genius, moderate skill and ordinary prudence, acquire a name and a fortune equal or superior to men of higher talents and attainments, was Joseph Wilton, who was state coach carver to George III., and modelled the ornaments for the coronation state coach. He was born in London on July 16, 1722. His father, though a common plasterer, acquired a fair fortune by manufacturing ornaments for ceilings and for furniture, resembling those known in France by the name of *papier-maché*, and in his workshops in Hedge Lane, Charing Cross, and in Edward Street, Cavendish Square, he employed several hundreds of men and boys in this profitable manufacture. These premises were afterwards occupied by his more eminent son. Having shown early in life a strong inclination for sculpture, he was placed under Laurent Delvaux at Neville, in Brabant. Of the progress which he made under this foreign instructor we have no account. In his twenty-second year he proceeded to Paris—studied in the Academy under the direction of Pigalle, whom Voltaire patronised—gained the silver medal and made himself acquainted with the art of working in marble. In 1747 he removed to Rome, where he distinguished himself so much to the satisfaction of the Roman Academy, that in 1750 he was presented with what is called the Jubilee Gold Medal, given by Pope Benedict XIV.—and, what was more beneficial to his future fortunes, acquired the patronage of Mr. Locke of Norbury Park—a gentleman eminent for taste and no less so for generosity. Wilton was the first of our native sculptors who went through a regular course of academic study—the wealth of the family enabling him to gratify all his desires of instruction and of travel.

During his stay in Italy he executed many copies of the antique statues, and as they were in marble it is likely that he had assistants, for a fine copy of a work of art in such materials can be done by no one in a hurry. For these productions he found a ready market, chiefly amongst his travelling countrymen, and no doubt was willing to believe that what filled his pocket extended his reputation. It was the practice then to manufacture statues and paintings of all dimensions, but chiefly half or full size, from esteemed works, and sell them according to the generosity of customers. This has filled the world with multitudes of coarse imitations, which have nothing of their originals save the posture and dimension, and are deficient in all that distinguishes the works of genius from those of a machine. Having thus spent eight years in Italy, Wilton returned to London, accompanied by Cipriani the painter, Chambers the architect, and one Capizzoldi, a skilful modeller, a sculptor and also a painter, who was desirous of finding a fortune in England. This poor Italian wanderer took an attic in Warwick Street, purchased two real chairs and a table—having no more money to spend among the upholsterers—limned upon the naked walls the proper allowance of sofas and curtains, and in this humble abode entertained his friends on the equally humble fare of an oyster and a pint of porter. A far different abode awaited his friend Wilton. The Duke of Richmond at this period conceived an affection for sculpture, and resolved to give his country the advantage of his taste and enthusiasm. He formed a gallery in Spring Gardens, purchased thirty casts of antique groups and statues, opened the doors to the students of art, and promised premiums to the most meritorious. Of this gallery Wilton and Cipriani were chosen directors, and Romney was one of the students. Joseph Wilton was tall, portly and personable, a perfect gentleman in manners, a warm friend and an agreeable companion. He went always dressed in the extremity of fashion, with a gold-headed cane, and a bag-wig plentifully powdered. His bust by Roubiliac represents him with a sculptor's hammer in his hand; it was given by Lady Chambers to the Royal Academy. Of his system of study or habits as an artist, who would inquire as a matter of either improvement or curiosity? and how little could now be ascertained were the inquiry made? As a sculptor he has little original merit; with much of the mistempered fancy of Roubiliac he shows none of the Frenchman's poetry—he is never lofty and but seldom natural. There is generally a coldness of sentiment in his faces, and a want of dignity in his attitudes. His groups are mobs, his statues appear reeling and intoxicated. There is no gravity, no repose; all is on the stretch, till action becomes painful. In his chief monuments we look in vain for that melancholy grace and serenity so becoming in sepulchral sculpture. The whole seems tumbling like waves of the sea. All that can be said on the other side



is that Wilton exhibits occasional grace of thought and frequent skillfulness of execution, and that in his greater works there is a sort of picturesque splendour, which, in the opinion of the mob at least, will cover a multitude of sins.

### Representation and Deceptive Imitation.

Painting, like every other of the free arts, is an embodiment of the universal or ideal in the particular material element with which it has to deal. From hence it derives a special mode of representation, which consists not in merely imitating the actual, nor in imaginary reflections of the purely notional, but which impresses on the forms of natural objects a tone and character of something which the mind conceives of their essential and spiritual type—which is the true "beautiful" of art. Its proper expression, therefore, must be sought, as to its general tendency, in characters that awaken the spiritual as opposed to the animal perceptions; as to its executive part, it must substantially reproduce rather than mimic nature. The beauty which it embodies must raise the mind to pure conceptions, not allure it to earth by exciting the senses. In order to this it must never forget its peculiar function, which is to project on the illuminated sphere of art a virtual image of the material thing depicted—not to repeat a positive identity. Representation, therefore, in a certain heightened form, not deceptive imitation, is its province. In proportion as the one is kept in view, with regard to the symbolic bias of true art, will its productions, in design as in the smallest detail, tend upwards and towards perfection. With the first steps on the other side begins the downward way, leading to error and poverty in design, to extravagance or weakness in manual execution. The first was the way which the great masters, whether consciously or instinctively, followed; deviation into the second was the signal of decline in art—and it is to this day misleading too many of its actual professors.

### Greek Craftsmen.

Throughout the history of art in every age its greatest workmen have, with very few exceptions, not been highly educated, but, according to our modern standard, ignorant, uncultivated men. The special excellence by which each working man was individually known was art in workmanship; and thus in ancient Greece the very names of architects and artists indicate their artisan ability. The mythic centaur-artist Chiron was, in English, "Mr. Handy;" Cheirisophus, a carver of repute, was "clever-handed." Then there were Eucheir and Eupalamus, each "good-handed;" and the artist Chersiphron, the "handy-minded," was one of the master-workmen at the Ephesian temple of Artemis. These Greek names derived from handicraft are interesting in their difference from our own, which are all simple names, like Mason, Carpenter and Smith, Paynter and Wright, and in the second generation, like Benhadad, Mr. Smithson. There is no quality or excellence denoted; but in Greece the quality is most considered, not the trade.

### Roman Plastering.

The houses of the Roman or semi-Greeks (as those of Pompeii were) had the natural colour of the pavements altogether carried off and subdued by the most vivid artificial colours that can be imagined. The walls and columns were covered with the beautifully delicate white crystalline plaster which surpassed the very marble itself in absolute purity of whiteness. And this plaster was then marked out and divided into panels, and covered with delicate ornament in the most brilliant and powerful colours that have been ever used; colours used not as mere auxiliaries to heighten the general effect of a more quiet general tint, but in large broad masses, edged round with borders of tints deeper, but just as bold, and where the mansion or the room was of a more ornate class, set off with a border or a centre piece, which embodied the dreams of their elegant but licentious theology in forms of very loveliness. But all this was very superficial and fading—a damp wall, a piece of imperfect plaster, could wreck the finest fresco—and the ancients then brought to bear upon their wall decoration the same kind of work which they used more coarsely though effectively in their pavements.

### GENERAL.

The City of Leipzig has purchased for 7,500*l.* the monument of Beethoven, executed by the German sculptor, M. Max Klinge.

The French Government have purchased the following architectural drawings from the Salon:—Lavabo, attributed to Luca della Robbia, by M. Polart; an old window, by M. Ottin; the church at Triel, by M. Hannotin; and a fresco in the Manor of Challant, by M. Chauvet.

At a Meeting in London it was resolved unanimously "That it is desirable that a national memorial of the late Right Hon. Cecil Rhodes should be provided, and that an executive committee be appointed to collect the necessary funds and decide the form of the memorial, reporting hereafter to those summoned to this meeting."

The General Committee of the Wykehamist South African War Memorial, having adopted the recommendation of the executive committee that the memorial should take the form of a new entrance gate into the school grounds, in place of the one now existing by the racquet court, met on Tuesday to consider plans and designs for the gate submitted by various architects. It was resolved that, subject to the approval of the governing body, Mr. Frank L. Pearson should be instructed to carry out the memorial.

The Fortifications of Cologne are to be removed, and the ground occupied by the military zone will be sold to the city. The price to be paid is 98,000,000 marks.

Plans for the Brighton Electric Railway will be lodged in November, and which, it is to be hoped, will sustain examination, unlike those of last year.

Mr. Mathew Ridley Corbet, A.R.A., died of pneumonia on Wednesday in last week. He was lately elected an associate of the Academy. He was a pupil of Signor Costa, and in all his works the influence of Italy was perceptible. He was in his fifty-third year, but his powers were only recently admitted.

The Galerie des Machines, which formed part of the Paris Exposition, has been let for four months at a rent of 60,000 francs, for the purposes of organising an exhibition of aerostation.

The Trappists, who have settled near Kingsbridge, South Devon, have decided to spend the sum of 30,000*l.* in the erection of a monastery.

Ten Works of Sculpture have been purchased from the Salons for the decoration of buildings or open places in the outer districts of Paris.

The Military Museum in the Invalides, Paris, has been enriched by a collection of models in cardboard numbering 20,000, and representing all varieties of Napoleon's troops. The figures belonged to the late M. Würtz, an apothecary in Paris, and were all prepared in Alsace.

M. Karapanos has presented his valuable collection of antiquities, mainly consisting of objects found at Dodona, to the Greek nation. The collection will be preserved in a separate room at the Archæological Museum.

M. Camille Bernier, the French painter, has bequeathed to old and poor members of the Society of French Artists the sum of 20,000 francs.

The Degree of D.Litt. has been conferred by the University of Dublin upon Mr. George Abraham Grierson, Fellow of the University of Calcutta, chief of the Linguistic Survey of India; Dr. Theodore Reinach, and Mr. William Ridgeway, Disney Professor of Archæology at Cambridge.

Mr. G. W. Humphreys has been appointed manager of works by the London County Council at a salary of 1,200*l.* a year.

A Soldiers' Monument in honour of twenty Nova Scotian soldiers who fell in the South African war was unveiled in Halifax last week. The statue, which is placed on a high pedestal, is a figure of a khaki-clad Canadian soldier, and cost 2,000*l.*

Portions of the old Roman road to the North have been uncovered during some excavations at Chester-le-Street, Durham. The track was met with a yard below the present surface.

M. Forain has been commissioned to paint a panel to be placed in the buvette of the Paris Municipal Council in the Hôtel de Ville. A sum of 10,000 francs has been voted for that purpose.

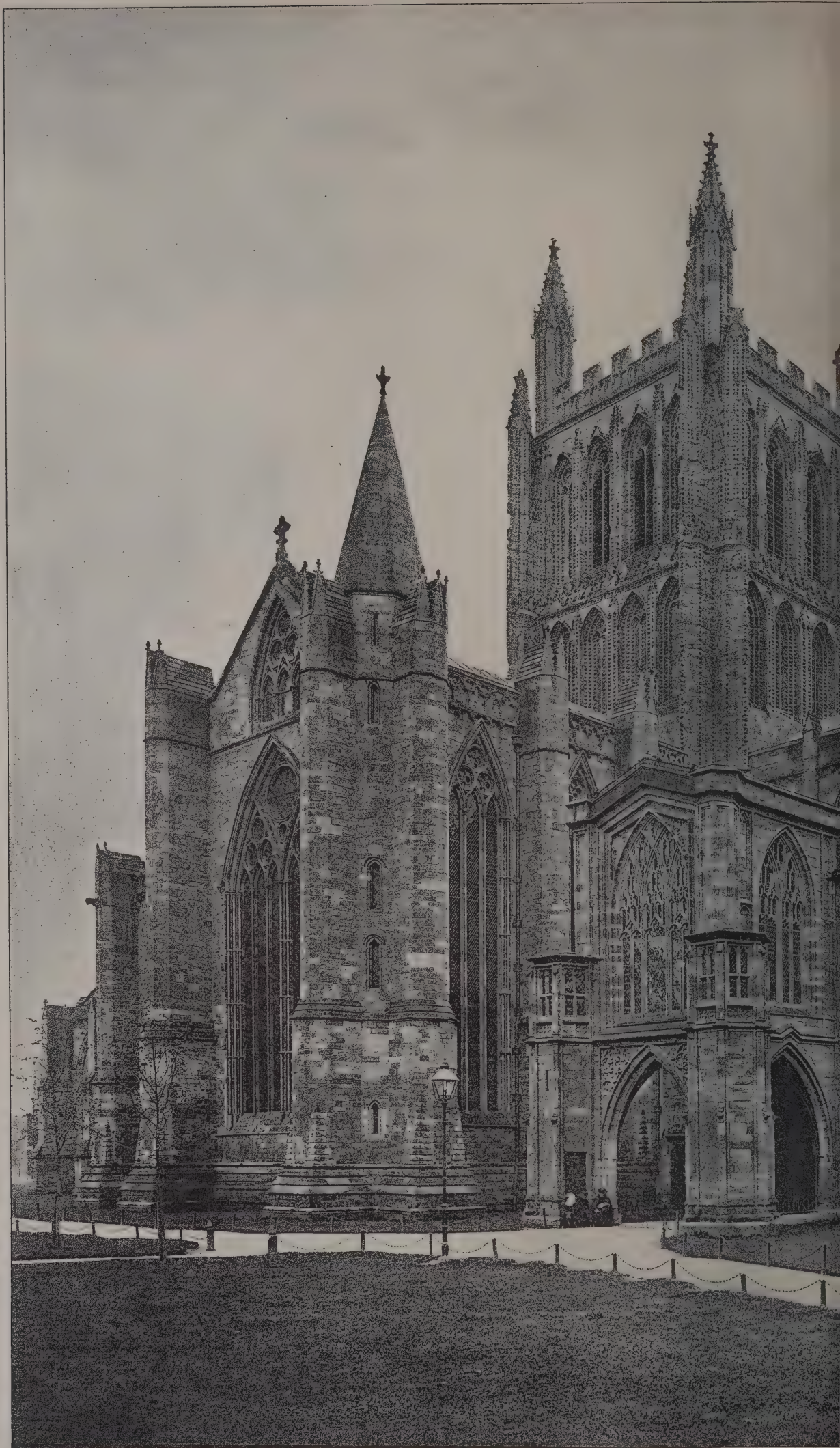
The London County Council have instructed the special committee on new offices to bring up a report at the earliest possible date as to a site for a county hall.

Mr. Thornycroft, R.A., submitted to the committee the sketch-model of the statue of Bishop Creighton for St. Paul's Cathedral. The bishop is in his cope, with his pastoral staff in his left hand, and in the act of giving the blessing. It is to be placed in the choir aisle, between the carved surfaces of the oak screens. On the advice of the sculptor, supported by letters from Mrs. Creighton and the surveyor of St. Paul's Cathedral (Mr. Somers Clarke), the statue will be erected in bronze instead of Carrara marble, as originally intended. Mr. Thornycroft proposes to add a bronze background and affix to the pedestal two panels representing History and Theology. The statue will be finished by about October, 1903.









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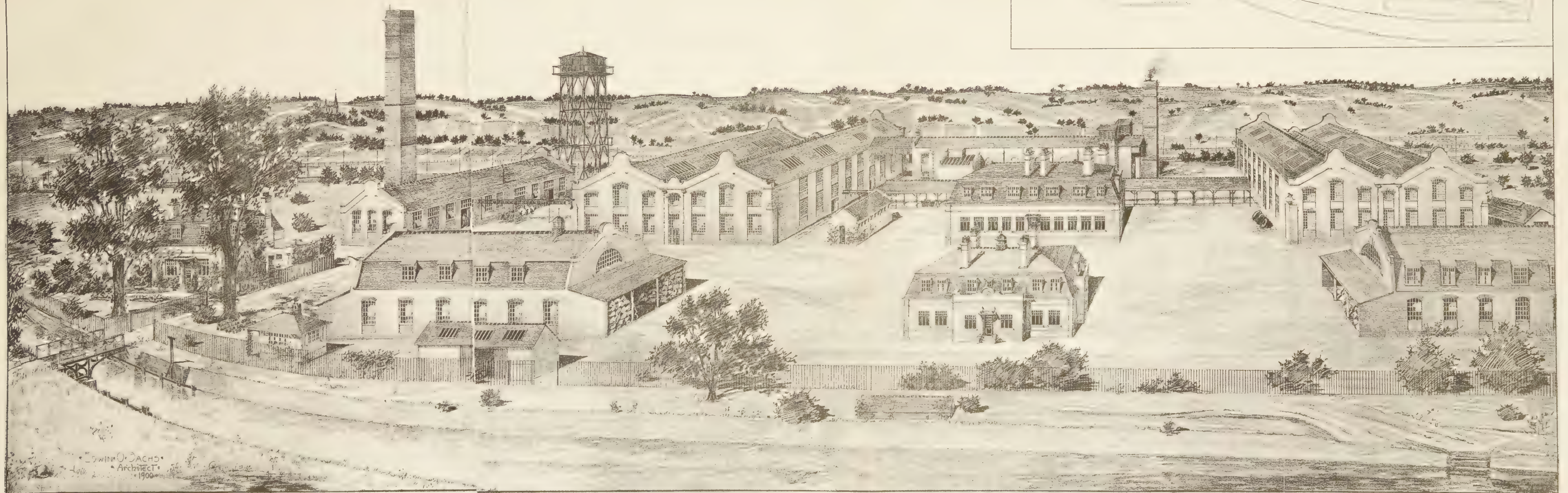
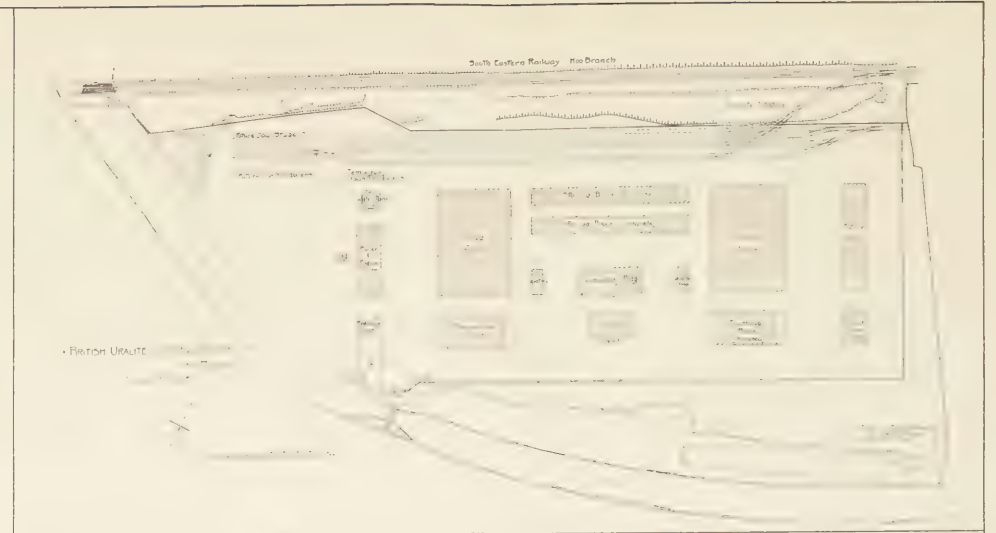




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THE

## Architect and Contract Reporter.

## EDITORIAL NOTICES.

*In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications*

## TENDERS, ETC.

*\*\*\* As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

## COMPETITIONS OPEN.

**AYLESBURY.**—July 19.—Designs and estimates are invited for supplying and erecting a stone monument, 50 feet high, on Coombe Hill, near Aylesbury. Mr. R. J. Thomas, county surveyor, County Hall, Aylesbury.

**BERMONDSEY.**—Sept. 16.—Designs are invited for artisans dwellings to be erected on land at Rotherhithe, within the borough of Bermondsey, and known as the Fulford Street area. Premiums of 100*l.*, 60*l.* and 40*l.* will be awarded. Mr. Fredk. Ryall, town clerk, Town Hall, Spa Road, S.E.

**CLACTON-ON-SEA.**—July 26.—Plans are invited for erection of a new school in Holland Road, Great Clacton, for 500 children, showing enlargement for an extra 300 children. Mr. Charles E. White, clerk, Wellesley Road, Clacton-on-Sea.

**DEPTFORD.**—Aug. 30.—Competitive designs are invited for a town hall and municipal offices. Premiums of 100*l.*, 75*l.* and 50*l.* are offered for the three selected designs. Mr. Vivian Orchard, town clerk, Municipal Offices, 20 Tanner's Hill, Deptford S.E.

**INDIA.**—Nov. 1.—Competitive designs are invited for the erection of a memorial to Her Majesty the late Queen Victoria at Allahabad. A premium of 2,000 rupees will be awarded to the design selected by the committee. Mr. H. Nelson Wright, Indian Civil Service, honorary secretary, Queen Victoria Memorial Fund Committee, Allahabad, India.

**LIVERPOOL.**—Sept. 15.—Designs are invited for new labourers' dwellings to accommodate about 2,500 persons, to be erected on the Hornby Street area. Premiums of 250*l.*, 150*l.* and 100*l.* respectively are offered for the first three selected designs. Particulars will be supplied by the Town Clerk.

**SOUTHEND.**—Sept. 7.—Designs are invited for a church to accommodate 500 persons, a clergy-house, and a parochial hall or parish-room about 50 feet by 30 feet. Mr. C. H. J. Talmage, Kathleen Villa, Southchurch Road, Southend-on-Sea.

**SUNDERLAND.**—Aug. 30.—Designs are invited for proposed police and fire-brigade buildings to be erected in Gill Bridge Avenue and Dun Cow Street. Premiums of 100*l.*, 50*l.* and 25*l.* are offered for first, second and third designs respectively. Mr. Fras. M. Bowey, town clerk, Town Hall, Sunderland.

**TOTTENHAM.**—July 15.—Designs are invited for municipal buildings, fire station, public baths, &c. Premiums of 200*l.*, 100*l.* and 50*l.* are offered for the three best designs in order of merit. Mr. W. H. Prescott, surveyor to the Council, Tottenham.

## CONTRACTS OPEN.

**ALDERSHOT.**—July 23.—For erection of stables, cartsheds and other buildings in connection with the new dépôt. Mr. Nelson F. Dennis, surveyor, Aldershot.

**BALHAM.**—July 15.—For alterations and additions to the tramways dépôt. Architect's Department (General Section), L.C.C., 19 Charing Cross Road, W.C.

**BOSTON.**—July 14.—For erection of municipal buildings. Mr. Jas. Rowell, architect, Borough Offices, Market Place, Boston.

**BARNSELEY.**—July 7.—For erection of offices and foundation, &c., for a corrugated-iron car-shed. The Architect, British Electric Traction Co., Ltd., 1 Adelphi Terrace, W.C.

**BIRKENSHAW.**—July 10.—For erection of Wesleyan Sunday schools at Westgate Hill, Birkenshaw, Yorks. Messrs. Walker & Collinson, architects, Swan Arcade, Bradford.

**BISHOP AUCKLAND.**—July 10.—For erection of 200 workmen's and agents' houses. Mr. I. A. Derwent, 19 Danesbury Terrace, Darlington.

**BRADFORD.**—For erection of seven houses in Toller Lane. Mr. W. H. Oxley, 9 Toller Lane, Manningham, Bradford.

**BRADFORD.**—July 14.—For erection of buildings on a site in Drummond Road, Manningham, Bradford. Messrs. Empsall & Clarkson, architects, 7 Exchange, Bradford.

**CANTERBURY.**—July 14.—For works required at the boys' dormitory of the workhouse. Mr. G. Smith, architect, 34 Station Road, Canterbury.

**CARLISLE.**—Aug. 1.—For erection of grand stands, &c., for the Carlisle Race Stand Company, Ltd. Mr. Joseph Graham, architect, Bank Street, Carlisle.

**CHESHUNT.**—July 9.—For erection of twelve cottages for workmen, in blocks of six, within one mile of Cheshunt railway station. Mr. A. Collingwood Lee, clerk, Manor House, Cheshunt.

**COCKINGTON.**—July 15.—For completion of St Matthew's Church, Cockington. Messrs. Nicholson & Corlette, architects, 2 New Square, Lincoln's Inn.

**COVENTRY.**—July 7.—For erection of porter's bedroom and alterations to form committee-room at the Coventry and Warwickshire hospital. Mr. Herbert W. Chattaway, architect, Trinity Churchyard, Coventry.

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COVENTRY.—July 7.—For re-covering the roof of the market hall with zinc and glass. Mr. J. E. Swindlehurst, city surveyor, St. Mary's Hall, Coventry.

CUBLEY.—July 11.—For erection of a bridge near Bentley Hall, Cubley, Derby. Mr. John Barker, surveyor to the District Council, Cubley.

EXETER.—For erection of a roof, about 60 feet by 48 feet, over a portion of the Old Quay Foundry and Engine Works, Commercial Road. Mr. J. Archibald Lucas, architect, Guildhall Chambers, High Street, Exeter.

FALMOUTH.—July 17.—For erection of a classroom at Wellington Terrace school. Mr. W. Jenkins, clerk to School Board, 39 Church Street, Falmouth.

FOSDYKE.—July 10.—For erection of a pair of cottages in Fosdyke, Lincs. Mr. John Kirkby, Fosdyke, Lincs.

GILLINGHAM.—July 10.—For supply and erection of two corrugated iron buildings on Gillingham pier and wharf, Gillingham, Kent. Mr. F. C. Boucher, clerk to U. D. C., Gardiner Street, New Brompton.

HALIFAX.—July 7.—For plastering the walls and for providing and fixing a wood dado throughout Portland Road school, Halifax. Mr. W. H. Ostler, clerk to School Board, 22 Union Street, Halifax.

HALIFAX.—July 12.—For erection of stabling, &c., in Hope Street. Messrs. Richard Horsfall & Son, architects, 22A Commercial Street, Halifax.

HASTINGS.—July 15.—For erection of a technical school on the Tower Road school site. Mr. A. W. Jeffery, architect, 5 Havelock Road, Hastings.

HIGH HARRINGTON.—July 11.—For erection and completion of a pair of semi-detached dwellings at High Harrington, Cumberland. Mr. Jos. Eden, architect, 38 Pow Street, Workington.

HUDDERSFIELD.—July 9.—For erection of thirteen dwelling-houses in Scar Lane, Milnsbridge. Mr. J. Berry, architect, 3 Market Place, Huddersfield.

HULL.—July 14.—For erection of a municipal school of art in Anlaby Road, Hull. Messrs. Lanchester, Stewart & Rickards, architects, 1 Vernon Place, Bloomsbury Square, W.C.

IPSWICH.—July 9.—For erection of a chimney-shaft and the reconstruction, with additions, of the present boiler-house and other works in connection therewith at the borough asylum. Mr. E. Buckham, borough surveyor, Town Hall, Ipswich.

IRELAND.—July 7.—For erection of labourers' cottages and for additions to and alterations in existing cottages in various electoral divisions of Kilmallock rural district. Mr. J. Ryan, Kilmallock.

IRELAND.—July 7.—For erection of a caretaker's house in connection with the sewerage-disposal works, Armagh. Mr. T. G. Peel, town clerk, Tontine, Armagh.

IRELAND.—July 7.—For erection of hospital buildings at Victoria Road, Larne. Mr. N. Fitzsimmons, architect, 82 Royal Avenue, Belfast.

IRELAND.—July 7.—For erection of two labourers' cottages in the townland of Dromore, Stranorlar. Mr. G. M'Laughlin, clerk, Board-room, Workhouse, Stranorlar.

IRELAND.—July 8.—For additions to the Roseland school, Andersonstown. Messrs. Young & Mackenzie, architects, Scottish Provident Buildings, Belfast.

IRELAND.—July 8.—For alterations, &c., at the Glengall Street, Rumford Street and Springfield Road dispensary stations, Belfast. Messrs. Young & Mackenzie, architects, Scottish Provident Chambers, Belfast.

IRELAND.—July 10.—For erection of three labourers' cottages and out-offices, as follows: one at Hollymount, Julianstown, E.D.; one at Claristown, Julianstown, E.D.; one at Gibblockstown, Stamullen, E.D.; also for repairs to thirty-nine labourers' cottages in the E. divisions of Ardagh, Julianstown and Stamullen, Meath. Mr. Louis Turley, architect, Meath.

IRELAND.—July 10.—For erection of a storeroom at the rear of the engine-house at the lunatic asylum, Armagh. Mr. R. H. Dorman, county surveyor.

LANGHO.—July 7.—For erection of eight dwelling-houses proposed to be erected at Langho, Lancs. Messrs. Simpson & Duckworth, architects, Richmond Chambers, Blackburn.

LEEDS.—July 15.—For erection of premises for the Halton parish institute, at the junction of High Street and Chapel Street, Halton. Messrs. Bedford & Kitson, architects, Greek Street Chambers, Leeds.

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ADDRESSES: DARLINGTON, NEWCASTLE-ON-TYNE, SUNDERLAND, MIDDLESBRO' and NORWICH.



**LEEDS.**—July 16.—For erection of dispensary premises in North Street, Hartley Hill and Back Brunswick Street, Leeds. Messrs. Bedford & Kitson, architects, Greek Street Chambers, Leeds.

**LEICESTER.**—July 21.—For erection of an infirmary at North Evington. Messrs. Giles, Gough & Trollope, architects, 28 Craven Street, Charing Cross, S.W.

**LEWES.**—July 23.—For erection of board-room and offices in West Street, Lewes. Mr. Henry Card, architect, 10 North Street, Lewes.

**LEWISHAM.**—July 7.—For providing and fitting three additional private baths at the public baths, Ladywell. The Borough Surveyor, Town Hall, Catford.

**MIDDLESBROUGH.**—July 14.—For erection of three brick annexes to the hospital wards and works in connection with the main drainage, &c., including manholes, &c. Mr. Frank Baker, borough engineer, Municipal Buildings, Middlesbrough.

**MILLOM.**—July 12.—For erection of premises for the Bank of Liverpool, Ltd, Millom, Cumberland. Mr. John F. Curwen, architect, 26 Highgate, Kendal.

**NEWARK.**—July 22.—For erection of an infant school accommodating 300 children on a site adjoining the Great North Road, Balderton. Messrs. Saunders & Saunders, architects, Arcade Chambers, Newark-on-Trent.

**NEWCASTLE-ON-TYNE.**—July 11.—For alterations at Elswick Grange, adjoining the workhouse. Messrs. Oliver, Leeson & Wood, architects, Mosley Street, Newcastle.

**NEWCASTLE-ON-TYNE.**—July 11.—For alterations at the basement ward of the hospital. Messrs. Newcombe & Newcombe, architects, 89 Pilgrim Street, Newcastle-upon-Tyne.

**OSSETT.**—July 7.—For erection of a villa residence in Ossett, Yorks. Mr. George Patterson, architect, Ossett.

**PAIGNTON.**—July 9.—For erection of a boundary wall, gate piers and gates, Cecil Road, Paignton. The Manager, Gasworks, Paignton.

**PLYMOUTH.**—July 16.—For erection of a dry wall at Knighton and laying pipes at Wembury Ford. Mr. Fred. Wm. Cleverton, 4 Buckland Terrace, Plymouth.

**PRESTON.**—July 8.—For rebuilding (in stone) of Apley (Hundred) bridge, which carries the secondary road leading from Upholland to Chorley over the river Douglas. The Chairman of the Main Roads and Bridges Committee, County Bridgemaster's Office, Preston.

**ST. AUSTELL.**—July 10.—For alterations and additions to premises in Fore Street, St. Austell, Cornwall. Mr. T. H. Andrew, architect, 1 Trevarrick Villas, St. Austell.

**SCOTLAND.**—July 31.—For extension of Glasgow Central Station hotel for the Caledonian Railway Company. Mr. James Miller, architect, 15 Blythswood Square, Glasgow.

**SCOTLAND.**—July 7.—For alterations and repairs to March-head, Mosstowie. Messrs. A. & W. Reid & Wittet, architects, Elgin.

**SCOTLAND.**—July 7.—For erection of a school at Tullibody, Alloa. Messrs. Thomas Frame & Son, architects, 43 Mill Street, Alloa.

**SCOTLAND.**—July 8.—For erection of new infant department of Bainsford public school, Falkirk. Messrs. A. & W. Black, architects, Falkirk.

**SHERBORNE.**—July 18.—For cleaning and repairing the interiors of the following police stations, viz.:—Beaminster, Blandford, Bridport, Cerne, Cranborne, Dorchester, Gillingham, Lyme Regis, Shaftesbury, Sherborne, Sturminster, Wareham, Wimborne, Dorset. Mr. E. A. Fooks, clerk to the Standing Joint Committee, Sherborne.

**SHILLINGSTONE.**—July 15.—For reconstructing the Hayward bridge, Shillingstone, Dorset. Plans and specifications and particulars may be obtained at County Surveyor's Office, Wimborne.

**STROOD.**—July 9.—For alterations in connection with providing additional strong-room accommodation and erection of new lavatory, &c., at the board-room and offices of the workhouse at Strood, Kent. Mr. G. E. Bond, architect, Pier Chambers, High Street, Chatham.

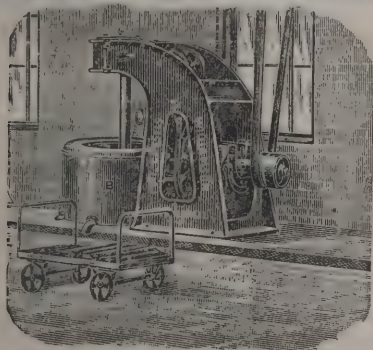
**THORNTON.**—July 16.—For erection of twenty-nine houses, &c., at Thornton, Yorks. Mr. Medley Hall, architect, 29 Northgate, Halifax.

**UTTOXETER.**—July 11.—For erection of two new cells and other additions and alterations at Uttoxeter police-station, Staffs. Mr. Walter H. Cheadle, architect, Stafford.

**WALES.**—July 7.—For erection of sixty workmen's cottages at Gellifaelog, Penydarren. Mr. T. Roderick, architect, Aberdare.

**WALES.**—July 7.—For erection of sixty workmen's cottages at Gellifaelog, Penydarren. Mr. T. Roderick, architect, Merthyr.

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WALES.—July 9.—For erection of two semi-detached houses at Amos Hill, Penygaig. Messrs. Lewis & Morgan, architects, Tonypandy.

WALES.—July 10.—For erection of fourteen cottages at Abercynon. Mr. E. Williams, architect, Andrews' Buildings, Cardiff.

WALES.—July 12.—For additions and improvements to the Tabernacle C.M. chapel, Cardigan. Mr. W. Joseph Thomas, 2 William's Terrace, Cardigan.

WALES.—July 18.—For erection of schools at Bala. Mr. R. Ll. Jones, architect, Station Road, Bala.

WALES.—For erection of two cottages at Aber Bargoed. Mr. Edmund Evans, 17 Hanbury Road, Bargoed.

WALES.—July 24.—For erection of a boiler and engine house at the Joint Counties asylum, Carmarthen. Particulars on application to the Clerk to the Asylum.

WIBSEY.—For erection of four houses at Wibsey, near Bradford, Yorks. Mr. David W. Weatherhead, architect, Low Street, Keighley.

WROUGHTON.—July 8.—For completion of eleven houses in Winifred Terrace, Swindon Road, Wroughton. Mr. W. A. H. Masters, architect, 38 Regent Circus, Swindon.

YORK.—July 16.—For erection of the proposed general offices at York, for the North-Eastern Railway Company. Mr. William Bell, company's architect, York.

THE Shipley District Council have instructed their engineer, Mr. Malcolm Paterson, M.Inst.C.E., of Bradford, to prepare the necessary plans and sections for the extension of their bacterial beds in accordance with the requirement of the Local Government Board. It may be remembered that after receiving the sanction of the Local Government Board in 1896 for the tank precipitation and land filtration scheme, designed by Mr. Paterson, the Shipley Council decided to carry out a bacterial scheme without awaiting further sanction, and it now appears that the scheme carried out is not deemed sufficient by the Local Government Board. The additional works required will include  $1\frac{1}{4}$  acres of bacterial beds and an extension of the land filtration area.

## TENDERS.

### ALLERTON BYWATER.

For erection of seven houses, Allerton Bywater, Yorks. Messrs. GARSIDE & PENNINGTON, architects, Pontefract.  
S. MASON, Castleford (accepted) . . . £1,200 0 0

### ALDERSHOT.

For erection of a church at Badshot Lea, near Aldershot.

W. J. Snuggs	£2,987	0	0
J. Dorey & Co., Ltd.	2,905	0	0
W. Garland	2,826	0	0
W. Watson	2,800	0	0
S. Ellis	2,768	0	0
Maides & Harper	2,654	0	0
Martin, Wells & Co.	2,641	0	0
B. E. Nightingale	2,634	0	0
Goddard & Sons	2,560	0	0
A. G. Mardon	2,545	10	0
Tompsett & Co.	2,480	0	0
G. KEMP, Elm Road, Aldershot (accepted)	2,459	0	0

### BARNESLEY.

For pulling-down existing cottages and fire-escape house in St. Mary's Place and Westgate, and the erection of seven firemen's cottages and outbuildings, also for erection of shop fronts to shops in the Harvey Institute. Mr. J. H. TAYLOR, borough surveyor.

#### Accepted tenders.

G. Mellor, bricksetter, &c.	£960	0	0
J. Smith, joiner	420	0	0
Snowdan & Son, plumber and glazier	112	0	0
C. Dryden, plasterer	106	0	0
Fleming, slater	90	0	0
E. R. Fletcher, painter	23	4	9

### BRADNINCH.

For laying a new 4-inch iron water-main from the reservoir to the Guildhall, Bradninch, Devon. Mr. R. ELLIS, engineer, Gold Street, Tiverton.

M. Howe	£207	0	0
NICKS BROS., Bradninch (accepted)	185	0	0

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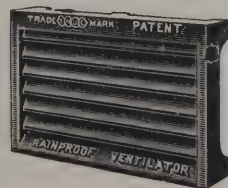
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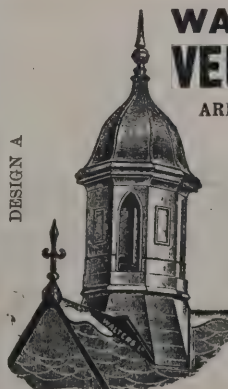
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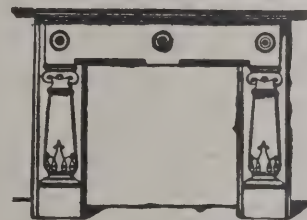
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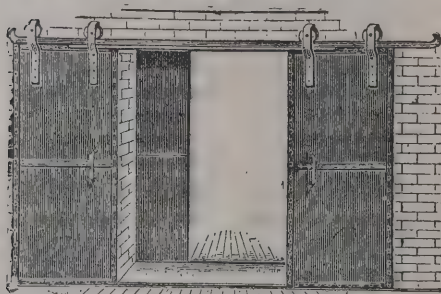
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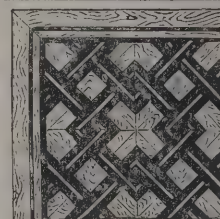
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J. Marsland & Son	665	0	0
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E. Spencer & Co.	670	0	0
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J. T. Robey	640	0	0
D. Gibb & Co.	632	0	0
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Stevens Bros.	144	0	0
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W. Simmons	125	0	0
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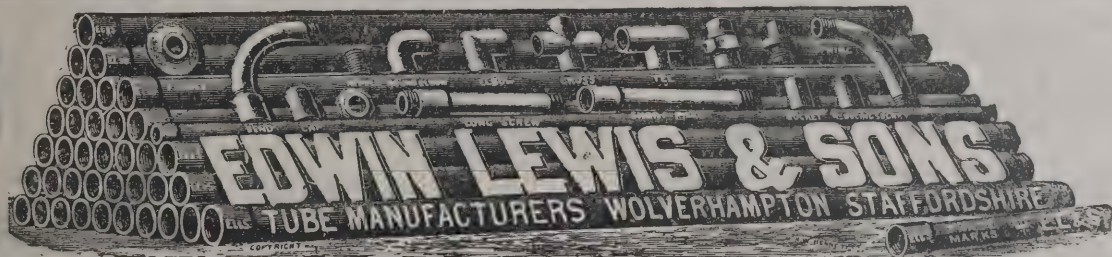
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Turtle & Appleton	4,223	0	0
F. & H. F. Higgs	4,200	0	0
Battley, Sons & Holness	4,129	0	0
G. Smart	4,110	0	0
H. E. Neville	4,072	0	0
F. Gough & Co.	3,979	0	0
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D. Parkins	3,935	10	0

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Turtle & Appleton	707	0	0
F. & H. F. Higgs	700	0	0
B. E. Nightingale	695	0	0
Battley, Sons & Holness	689	0	0
F. Gough & Co.	660	0	0
W. Dunham	670	0	0
D. Parkins	625	0	0

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Turtle & Appleton	335	0	0
F. & H. F. Higgs	326	0	0
C. Miskin & Sons	325	0	0
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Battley, Sons & Holness	310	0	0
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## LYDNEY.

For construction of waterworks. Mr. J. FLETCHER TREW, engineer, County Chambers, Gloucester.

*Contract No. 1.—Engine-house, &c.*

Griffiths	£998	0	0
Reading	957	0	0
Wood	853	0	0
Riley	841	0	0
Meredith	828	0	0
Shardlow	771	0	0
Powell	759	0	0
Byard	680	0	0
King	630	0	0
Perkins	625	0	0
Scull	600	0	0

*Contract No. 2.—Reservoir.*

Griffiths	3,065	0	0
Reading	2,639	0	0
Riley	2,509	0	0
Powell	2,418	0	0
Meredith	2,400	0	0
Wood	2,330	0	0
Byard	1,998	0	0
King	1,970	0	0
Perkins	1,911	0	0
Scull	1,678	0	0
Shardlow	1,647	0	0

*Contract No. 3.—Mains.*

Hancock	9,500	0	0
Wood	8,830	0	0
Shardlow	7,369	0	0
Griffiths	7,332	0	0
Byard	6,886	0	0
Woodward	6,860	0	0
Todhunter	6,588	0	0
Jowett	6,348	0	0
King	6,093	0	0
Beaven	6,084	0	0
Mason	5,852	0	0
Meredith	5,829	0	0
Riley	5,704	0	0
Reading	5,631	0	0
Powell	5,396	0	0
Scull	5,189	0	0
Perkins	5,000	0	0

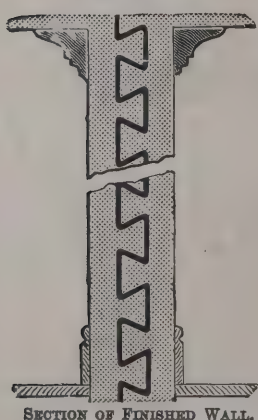
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MANSFIELD.

For alterations to and fitting-up part of the basement of the town hall buildings as public conveniences. Mr. R. FRANK VALLANCE, borough surveyor.

H. F. Houfton . . . . .	£1,090	0	0
Cahill & Leverton . . . . .	1,050	0	0
Vallance & Blythe . . . . .	1,016	0	0
J. Greenwood . . . . .	994	0	0
C. G. Percival . . . . .	972	13	4
S. B. FRISBY, Mansfield ( <i>accepted</i> ) . . . . .	901	10	0

For alterations and additions to public baths. Mr. R. F. VALLANCE, borough surveyor.

Cahill & Leverton . . . . .	£5,500	0	0
J. Greenwood . . . . .	5,200	0	0
Vallance & Blythe . . . . .	5,115	0	0
C. J. Percival . . . . .	4,520	0	0
Twettridge & Moore . . . . .	4,350	0	0
A. F. Houfton . . . . .	4,300	0	0
S. B. FRISBY, Mansfield ( <i>accepted</i> ) . . . . .	4,158	0	0

RUSHDEN.

For erection of drapery, &c., premises, High Street, Rushden, Northants. Messrs. COOPER & WILLIAMS, architects, Rushden.

Buckby . . . . .	£4,065	0	0
R. Marriott . . . . .	3,875	0	0
F. Henson . . . . .	3,850	0	0
T. Willmott, jun. . . . .	3,769	0	0
G. Henson . . . . .	3,745	0	0
H. Sparrow . . . . .	3,720	0	0
Brown & Sons . . . . .	3,716	10	0
Kettering Co-operative Builders . . . . .	3,594	0	0
T. Swindall . . . . .	3,588	0	0
T. & C. Berrill . . . . .	3,483	0	0
Whittington & Tomlin . . . . .	3,477	0	0
C. E. BAYES, Rushden ( <i>accepted</i> ) . . . . .	3,443	0	0

ST. COLUMB MINOR.

For constructing a new road at Porth, St. Columb Minor, Cornwall. Mr. J. ENNOR, jun., surveyor, Newquay.

Henwood & Son . . . . .	£800	0	0
E. Rowse . . . . .	735	0	0
W. S. TIPPETT, Newquay ( <i>accepted</i> ) . . . . .	732	10	0

ST. PANCRAS.

For erection of dwellings for the working class on land in Great College Street. Mr. KEITH D. YOUNG, architect, 17 Southampton Street, Bloomsbury.

Patman & Fotheringham, Ltd. . . . .	£22,015	0	0
H. Willcock & Co. . . . .	21,666	0	0
Martin, Wells & Co. . . . .	19,761	0	0
W. J. Renshaw . . . . .	19,050	0	0
Holloway Bros. . . . .	19,024	0	0
H. Wall & Co. . . . .	18,814	0	0
E. Lawrence & Sons . . . . .	18,445	0	0
C. G. Hill . . . . .	18,204	0	0
J. Appleby . . . . .	18,095	0	0
J. Smith & Sons, Ltd. . . . .	18,055	0	0
Sabey & Son . . . . .	17,901	0	0
L. WHITEHEAD & CO, LTD, Portland Place North, Clapham Road ( <i>accepted</i> ) . . . . .	17,734	0	0

SCOTLAND.

For erection of a dwelling-house at Greenburn Farm, Tyrie; a byre, stable, &c, at Muirstone Farm, Tyrie; a new stable and reroofing, &c., of part of present steading at Newmill Farm, Rathen. Mr. A. G. BROWN, architect, Witchill, Fraserburgh.

Accepted tenders.

Greenburn dwelling-house.

- G. Corbett, Fraserburgh, mason.
- T. Stephen, Fraserburgh, carpenter.
- W. Watt, New Pitsligo, slater.
- A. Craig, New Pitsligo, plasterer.

Stable and men's room, Muirstone.

- J. Rolls, Fraserburgh, mason.
- Brebner & Jenkins, Fraserburgh, carpenter.
- J. Reid, Fraserburgh, slater.

Byre and turnip shed, Muirstone.

- J. Rolls, Fraserburgh, mason.
- T. Stephen, Fraserburgh, carpenter.
- J. Reid, Fraserburgh, slater.

Addition and alterations, Newmill.

- J. Rolls, Fraserburgh, mason.
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- J. Reid, Fraserburgh, slater.

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## SCOTLAND—continued.

For extension of premises in Primrose Place, Alloa. Mr. JAMES MITCHELL, architect, Alloa. Quantities by the architect.

## Accepted tenders.

G. & R. Cousin, Alloa, builder.  
R. Kier, Tillicoultry, joiner.  
J. Davie, King Street, Alloa, plasterer.  
J. Grant, Alloa, slater.  
P. Rintoul, Alloa, ironwork.  
J. Philp, Alloa, plumber.  
Amount of tenders, £4,223 4s 7d.

## SETTLE.

For construction of a covered concrete service reservoir, collecting well, catch-water drains, straining chamber, valve well; excavating trench for and laying and jointing of about 3,064 lineal yards of 4-inch and 3-inch cast-iron mains, fixing valves, hydrants, laying service pipes, &c. Mr. T. A. FOXCROFT, surveyor, Town Hall, Settle.

J. Handby . . . . .	£758	3	5
T. Rowland . . . . .	716	17	8
C. Lord . . . . .	658	15	3
C. M. Slinger . . . . .	650	14	11
C. M. SLINGER, reservoir and collecting well, &c., only (accepted) . . . . .	315	15	6
W. HAYTON, Settle, mains only (accepted) . . . . .	283	10	6

## TAVISTOCK.

For erection of the Gill wing at the Tavistock cottage hospital.

Tozer & Son . . . . .	£3,116	0	0
W. H. Higman . . . . .	2,963	0	0
Trevan & Co. . . . .	2,926	0	0
P. Blowey . . . . .	2,835	0	0
Berry & Son . . . . .	2,777	0	0
Turpin & Co. . . . .	2,762	0	0
Pearn Bros. . . . .	2,750	0	0
A. Andrews . . . . .	2,646	0	0
J. A. Dennis . . . . .	2,618	0	0
T. Kerslake . . . . .	2,593	0	0
J. KELLEY, Horrabridge (accepted) . . . . .	2,350	0	0

## SOUTHWARK.

For erection of tenement houses for artisans, Hayles Street, St. George's Road. Messrs. WARING & NICHOLSON, architects, 38 Parliament Street, Westminster.

Johnson & Co. . . . .	£3,869	0	0
J. Chessum & Sons . . . . .	3,583	0	0
John Ham . . . . .	3,570	0	0
B. E. Nightingale . . . . .	3,489	0	0
J. V. Kiddle & Son . . . . .	3,437	0	0
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H. Burman & Sons . . . . .	3,390	0	0
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C. Dearing & Son . . . . .	3,330	0	0
T. L. Green . . . . .	3,273	0	0
M. Calnan & Son . . . . .	3,271	0	0
J. Marsland & Son . . . . .	3,265	0	0
C. Castle & Son . . . . .	3,228	0	0
H. Kent . . . . .	3,150	0	0
J. Appleby . . . . .	3,124	0	0
J. R. Tomkins . . . . .	3,110	0	0
Wm. Smith & Son . . . . .	2,989	0	0
J. Parsons . . . . .	2,925	0	0

## TEIGNMOUTH.

For erecting stabling and a motor-car house at Holcombe Hall.

G. LEE, Teignmouth (accepted) . . . . . £2,000 0 0

## UXBRIDGE.

For street works in Chester, Hallowell, Murray and Maxwell Roads, Northwood. Mr. J. FREEBAIRN STOW, surveyor.

T. FREE & SONS, Maidenhead (accepted).

## WALES.

For painting the sanatorium, Cardiff. Mr. W. HARPUR, borough engineer.

Williams Bros. . . . .	£119	13	0
D. R. Bradbury . . . . .	97	18	6
W. T. Morgan . . . . .	88	10	0
T. Cram & Son . . . . .	81	7	4
E. Turner & Sons . . . . .	79	12	0
F. G. Robbins . . . . .	70	15	10
GOUGH BROS., Cardiff (accepted) . . . . .	69	7	0
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For supply of a battery of accumulators. Mr. ALEXR. WYLLIE, borough electrical engineer.

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### WALTHAMSTOW.

For erection of a watch-room at the Council's fire station, High Street. Mr. G. W. HOLMES, engineer.

J. A. Reed . . . . . £257 0 0

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J. R. Cordell & Sons . . . . . 199 15 6

C. Castle & Sons . . . . . 190 0 0

Surveyor's estimate . . . . . 190 11 0

### WARSOP.

For erection of business premises at Warsop Vale, Warsop, Notts. Messrs. VALLANCE & WESTWICK, architects, White Hart Chambers, Mansfield.

J. Greenwood . . . . . £4,800 0 0

A. Eastwood . . . . . 4,489 2 6

Vallance & Blythe . . . . . 4,470 0 0

T. Barlow . . . . . 4,382 0 0

Cahill & Leverton . . . . . 4,340 0 0

C. G. Percival . . . . . 4,320 0 0

C. Vallance . . . . . 4,250 0 0

F. Lee . . . . . 3,863 0 0

T. CUTHBERT, Nottingham (*accepted*) . . . . . 3,808 0 0

### WEST BROMWICH.

For erection of schools in Oak Lane and Lodge Road, West Bromwich, to accommodate about 1,150 children. Mr. ALFRED LONG, architect, 21 New Street, West Bromwich

T. HARDY, West Bromwich (*accepted*) . . . . . £12,225 0 0

## BECKENHAM NEW SCHOOL AND INSTITUTE.

THE Bishop of Ripon formally opened on the 24th ult. the commodious block of buildings which have been presented by an anonymous donor to Christ Church, Beckenham, and are designed to afford the much needed accommodation required for the Sunday school. There is also a large hall suitable for meetings and parochial gatherings, whilst the Young Men's Institute will be provided with an excellent meeting-place. The new buildings comprise a school hall 58 feet long with the platform at the south end and a gallery at the north end, in which is a small but beautifully-toned organ. On either side of the hall are five bays for classes, which can be separated by curtains. Immediately adjoining the west porch is the superintendent's room, and at the back of the hall is a kitchen, with cooking appliances for use when refreshments are to be provided. At the south end towards the church are two classrooms for senior scholars, each having a porch, lavatory and independent approach from the road. Storage space is provided below the platform and classrooms for furniture, &c, not in use. The front railing of the platform is made easily removable for lantern lectures, concerts, &c. The site being upon a hill the institute room for young men, which is between the new hall and the old buildings, is approached down a few steps and is 37 feet long, with a fireplace at one end. This room has an independent entrance from the road, and in addition to lavatory accommodation there is a cycle shed for the use of members. The institute communicates by a lobby with the old building, which is newly fitted for use as a gymnasium on week-days and infant school on Sundays. The new buildings have been devised so as to avoid any interference with the light and ventilation of the old school buildings and the obstruction of the view of the church from High Street. The general contract has been carried out by Messrs. Higgs & Hill, of Crown Works, Lambeth. The architect was Mr. Francis Hooper, F.R.I.B.A., of 12 Norfolk Street, Strand, and Beckenham.

MR. HILEY, deputy town clerk of Birmingham, has been appointed town clerk of Leicester at a salary of 1,000*l.* per annum. Mr. Hiley thus succeeds Mr. Bell, who has been appointed town clerk to the City of London, and who formerly held a similar appointment in Birmingham.

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**ELECTRIC NOTES.**

THE navvies employed at the laying of the cables for the electric lighting of Airdrie have struck work for an increase of wages. The strikers number about 200.

At the meeting of the Stourbridge Council the electric powers and gas committees recommended, and it was decided, that the electric-lighting order which the Council had obtained should be retained by the authority, and that powers to carry out the order be transferred to the gas committee.

THE May-Oatway electric fire-alarm, to whose valuable attributes we have on several occasions referred, and of which Sir Eyre Massey has expressed his approval, has been installed at the Poplar workhouse, where on Wednesday afternoon before a number of architects, surveyors and other invited guests, a full demonstration of its remarkable rapidity of action was given to the satisfaction of all present.

THE accounts of the first fifteen months' working of the Stepney electric light undertaking have been published. They show that up to the end of the date under review the loan capital invested in the works was 109,000*l.* On the fifteen months' working there was a loss of 2,743*l.*, while a balance from the next year's working of 2,034*l.* is available towards the extinction of this loss. In the meantime the consumption of the municipal electricity is growing at the rate of 400,000 units per annum, and this, with the extension of the light to Mile End, gives every hope that in a short time the works will be returning a handsome profit to the ratepayers on their investment.

WORKING the points of the crossings is still one of the difficulties on electric tram lines. At Leeds, says the *Leeds Mercury*, pointsmen cost the Corporation about 2,000*l.* a year. To stop this waste a Leeds firm have devised an apparatus that can be worked from a car by either conductor or driver or by both. All that the driver or conductor has to do is to pull one of two strings, according to the direction in which it is desired to travel. The junction frog is so arranged that if the car gets on to the wrong metals it can be run backwards to rectify the error. Even if nothing be done to direct it by conductor or driver the car will keep the metals, and anything like an accident appears out of the question. An ingenious arrangement connected with the same apparatus effects the lighting of the car.

IN connection with the postponement of the Coronation illuminations, in many cases instructions have been received

by the E.L.B. Company to keep the illuminations in position, with the hope that they may be utilised on the recovery of the King. Amongst large public buildings equipped on the E.L.B. system where this has been the case is the Stock Exchange, and the lighting on the Company's system at Westminster Hall of course remains untouched until further notice. It is noteworthy that while the English company was busily engaged with Coronation requirements on this side of the water, the French company was attending to the equipment of several of the visitors to our Naval Review, as, for instance, the French cruiser *Montcalm* and Baron Rothschild's splendid yacht. The French company is now busily occupied with preparations for the Government and Municipal celebrations for July 14, having only recently completed the arrangements for the great fête at Neuilly.

THE first annual report of the West Bromwich electrical undertaking for the year ended March 31, 1902, was issued on Saturday. This states that the supply commenced on May 24, 1901, and up to March 31, 1902, there were 62,894 units measured by the consumers' meters. The total kilowatts installed was 250, exactly the present capacity of the generating plant. With the exception of a little trouble at the beginning, the engines and dynamos had run perfectly since the supply commenced. The maximum load on the station occurred on December 20, 1901, and amounted to 122 kilowatts, equal to 83 per cent. of the total number of lamps. The total cost per unit sold in the ten months' working was 4*48d.* This compares very favourably with the total costs of other stations. The total length of mains laid to date was—feeder, nearly 6 miles, distributor 4½ miles, pilot 2½ miles. The whole of this cable, except the pilot, had stood a pressure test since being laid of 2,000 volts between conductors for one hour. This voltage is eight times the working pressure of the cable. The total number of consumers wired by the department was fifty, representing 3,208 eight candle-power lamps, or 66 per cent. of the total number of lamps connected, and an outlay of 1,650*l.* On the ten months' working there was a deficiency of 1,403*l.*

AT the meeting of the Chichester City Council on Friday the electric-lighting committee reported that the County of Sussex Electrical Power Distribution Company (who have laid down plant at Lewes) were prepared to offer terms for the transfer to them of the Corporation's electric-lighting order; and as the committee were of opinion that the terms were as reasonable as could be got from any company, they

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recommended the Corporation to take such steps as might be necessary, and to transfer the order to the company subject to a satisfactory agreement. The terms included the following:—The company to repay the Corporation the costs incurred by the Corporation in obtaining the order; the Corporation to have the right of purchasing the works from the company by valuation as a going concern at the end of fourteen or twenty-one, or subsequent years in the usual way; as regards public lighting the Corporation were not bound to be customers of the company, but the latter would be prepared to supply energy by meter for public lighting and for all Corporation buildings and public places at the rate of 3d. per unit, or the following fixed rates:—For arc lamps burning up to 11.0 P.M., 15s. each per annum, if fitted with two incandescent lamps to burn from 11.0 P.M. till dawn, an additional 2s. per annum; for incandescent lamps each fitted with two 8 candle-power lights, and lit from sunset to dawn, 6s. per lamp per annum; with regard to the cost of light to private customers the company would adopt the Brighton system of charging, i.e. the charge would be 2½d. per unit for all current used by a consumer over and above a certain quantity in each quarter. Alderman Smith, in moving the confirmation of the committee's report, said as it was not considered desirable for the Corporation to carry out its own scheme for electric lighting the city, the next best thing would be to transfer the order on the most favourable terms, and he did not think it would be possible to obtain better terms than those mentioned above. The motion was seconded, and the Council confirmed the committee's report.

### TRADE NOTE.

THE Cherry Tree Machine Co., Ltd., engineers and iron-founders, Cherry Tree, near Blackburn, have secured the under-mentioned contracts:—For the supply of laundry machinery to the isolation hospital, Pontardawe, and the supply of a drying closet to the St. Andrew's Brine Baths, Droitwich, Worcestershire.

THE Ashwell Rural District Council have resolved to have water and drainage schemes prepared for the parish of Ashwell, Herts, and Mr. J. R. Elliott, A.M.I.C.E., of Nottingham, has been instructed to prepare the necessary plans.

### BUILDING AND BUILDERS.

THE premises of Messrs. Clegg Bros., joiners and builders, off Yorkshire Street, Burnley, caught fire on Sunday night. The roof soon fell in. The damage is estimated at about 1,500l., and is only partly insured.

At the meeting of Glasgow Trades Council last week the bricklayers' delegate reported that the employers had, in response to representations from the men, agreed to raise the wages ¼d. an hour. This is the amount of the reduction which was made about a year ago.

FREDERICK MILWARD, builder, of Whitchurch, Cardiff, who should have appeared at Llandaff police court on Monday, on a charge of having appropriated a quantity of building material belonging to another builder, committed suicide late on Saturday night by hanging himself in Cardiff Goal, where he was incarcerated on remand. When the case was called at the police court on Monday a letter was received from the governor of the gaol intimating that the prisoner had taken his life.

A SERIOUS scaffold accident occurred at Wood Green on Wednesday afternoon. Several workmen were attending to the roof of St. Michael's Church, which is in course of erection, when the scaffold collapsed. The men fell a distance of about 40 feet, and one of them, named Brooks, living at New Southgate, had several ribs broken and sustained some internal injuries. He was removed to hospital, where he lies in a critical condition. The others escaped with a severe shaking.

At a standing joint committee of the County Council of Linlithgow, Colonel Hope submitted a report with relative plans of new cells and constables' accommodation at Bathgate police station. After careful consideration it was agreed to carry out the work as suggested, and it was remitted to the chairman and Captain Steuart to get in offers for the work and to have it proceeded with as soon as possible. It is expected that the work will cost about 1,200l. The additional accommodation will embrace three cells and quarters for married sergeant and accommodation for the constables of Bathgate.

At the last meeting of the Burley-in-Wharfedale Union District Council the engineer for the new waterworks, Mr. M. Paterson, of Bradford, reported that the dam was within 9 feet of top-water level, and that 40,000 cubic yards of earthwork had been completed, leaving less than 10,000 cubic yards to be done. Of this probably more than nine-tenths had come out of the

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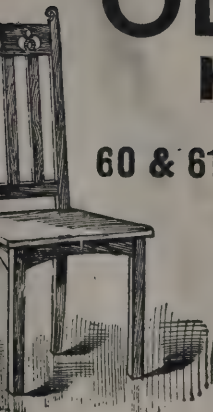
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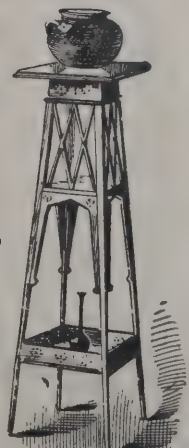
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reservoir site within water-line, in addition to most of the puddle, the rubble pitching and the beaching. The pitching is almost entirely obtained from surface drift boulders of mill-stone grit, naturally the hardest and most durable specimens of that stone. These were split into massive blocks and keyed up with smaller material. It is expected that the whole of the earthwork and puddle will be completed by the end of October, and the works by the end of the year.

### VARIETIES.

MR. ALFRED FIDLER, A.M.I.C.E., has been appointed engineer and surveyor to the Northampton Borough Council.

OVER 200,000*l.* has been received at the Mansion House towards the National Memorial to the late Queen Victoria. The Federated Malay States have sent 5,000*l.* to the fund through the Colonial Office.

HARTLEPOOL is at length in possession of a commodious town hall, the Corporation having purchased the building in Lumley Square known as the Temperance Hall, which has been altered, and is now admirably adapted to its new uses.

MR. JOHN HALLIDAY, late town clerk of Stewarton, N.B., died on the 23rd ult. Mr. Halliday, who was town clerk for upwards of forty years, retired a year or two ago on account of his failing health. He was in his eighty-first year, and is survived by a grown-up family.

THE University College Hospital committee have appointed Mr. George Hornblower, F.R.I.B.A., of No. 2 Devonshire Terrace, Portland Place, W., architect to the hospital, in succession to the late Mr. Henry D. Shepard, who received the appointment upon the resignation of the late Sir A. W. Blomfield, A.R.A.

WE have received from Messrs. Dawbarn & Ward, Ltd., 6 Farringdon Avenue, E.C., a copy of "Outdoor Carpentry," by S. Walter Newcombe, which is No. 1 of a country house series of practical handbooks. The book is carefully written and amateurs should find it of great utility. The series will deal with such subjects as planning a garden and grounds (No. 2 ready in about ten days), water-supply, sanitation, &c.

IT is proposed to restore the ancient keep in York Castle known as Clifford's Tower. Negotiations have been pending for some months between the Yorkshire county committee and the Home Office, and now the Government have made a grant

of 3,500*l.* towards the object. It is intended to make an almost immediate commencement with the work, which will consist of underpinning the tower and restoring the leaning sides to the equilibrium. The work, though not extensive, will be costly, it being intended that it shall be of a thoroughly substantial character.

MR. ANDREW CARNEGIE has offered to give 12,000*l.* for the purpose of providing a new central free library for Leicester, on condition that a site is provided and provision made for adequate maintenance out of the rates. Mr. Carnegie has also offered 15,000*l.* for the erection of two free public library buildings in Paddington, conditionally that the borough council supply the sites and agree to levy the maximum penny rate; and 2,500*l.* for a free public library building for the town of Larnie, provided the Urban Council undertake to collect or otherwise guarantee an endowment fund of 125*l.* per annum.

THE sixth annual exhibition of students' work at the London County Council Central School of Arts and Crafts in Regent Street is open to the public, free, between 10 A.M. and 8 P.M. from July 1 to July 5 inclusive. The work of the students comprises bookbinding, stained glass, silversmiths' work, enamelling, writing and illumination, carving and gilding, cabinetwork and wood-inlaying, architectural design, furniture design, drawing, modelling, &c. Seven hundred individual students have been in attendance during the session, the greater number being journeymen or apprentices engaged in artistic crafts. Saturday morning classes will be arranged next session for apprentices in the various branches of the silversmith's trade.

FOR the winter season 1902-3 it has been determined by the Glasgow museum and galleries committee, with the approval of the Corporation, to bring together a collection of artwork in metal. The exhibition section will embrace works, both ancient and recent, in gold and silver, brass, bronze, steel and iron, pewter and other mixed metals, with illustrations of such ornamental processes as damascening, chasing, engraving and enamelling on metals. In the competition division awards will be made under the following heads:—(1) Repoussé ornamentation on silver, copper, brass, or other metal. The objects sent in competition may be in the form of panels, plaques, salvers, vases, cups, cases, covers, sconces, &c. (2) Engraving and chasing, separately or combined, applied to vessels and domestic articles executed in gold, silver, brass, steel, or other metal. (3) Ornamental wrought-iron in the form of gates, grilles, panels, brackets, lamps, or other useful domestic articles.

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The exhibition will be held in the Glasgow Green Branch Museum (People's Palace). It will be opened about December 19 next, and will continue for a period of not less than three months. Loans will be received and exhibited free of cost to contributors.

ON Saturday afternoon the old Market Cross of Culross, which has been restored and re-erected by Sir James Sivewright, of Tulliallan Castle, was formally unveiled. The old steps, which are said to date back to 1588, the year in which the town was erected into a royal burgh, have been renovated and prepared for the new cross. The new shaft is tapered from 15 inches square at base to 13½ inches at top, and has a large splay off its four corners, and is in one stone 10 feet long let into old base and fixed with a copper dowel, 18 inches by 1 inch. The panelled top is in one stone, 25 inches high, with pilasters at angles, and carved on the four faces as follows:—Front face, arms of Culross; second face, arms of Sir James Sivewright; third face, cypher of King James IV.; fourth face, inscription of donor. The cornice is of one stone, with four curved pediments and seat for unicorn, and the pediments carved in each tympanum as follows:—First, date of creation of burgh, 1588; second, initials of Sir James Sivewright; third, date of restoration, 1902; fourth, initials of Provost Cunninghame. The apex has a unicorn sitting on its haunches, and holding in front of it the collar of the Order of the Thistle and the Royal shield bearing the arms of Scotland. The restoration was carried out under the supervision of Mr. J. W. Small, a well known authority on Scottish market crosses.

THE arrangements of the British Fire-Prevention Committee for July include a test with materials by the British Uralite Company on July 9. Further, a test with the Pearson automatic fire-alarm system and a test with glazing by the Union Plate Glass Company. The issue of publications during July will comprise Publications No. 71, dealing with a floor constructed of Jarrah timber, and Publication No. 72 dealing with a roof test with ordinary slate roofing and a roof covered with vulcanite. In respect to the committee's position regarding the inquest being held on the Queen Victoria Street fire, this investigation is being attended by the committee's counsel, Mr. Allison Russell, under instructions from Messrs. Williamson, Hill & Co. At the opening of the second sitting, Mr. Russell took the opportunity to make the statement that the interests of the committee in this inquest were strictly limited to questions of fire prevention, *i.e.* to matters relating to the planning, construction and equipment of the premises

involved, and that the committee did not intend to deal with the Fire Brigade aspect of this calamity, or to participate in the attack upon the Fire Brigade or individuals. In respect to the recent formation of the new Industrial Section, Alderman Sir W. P. Treloar, J.P., has accepted the first vice-chairmanship.

A NEW workhouse infirmary, erected by the Cheadle Board of Guardians to take the place of the old infirmary, which has become insufficient for the requirements of the union, was opened on the 20th inst. in the presence of a large attendance. The site is on land adjacent to the workhouse, which already belonged to the Guardians, so that no expenditure has been necessary under this head. The total cost, including laundry and machinery, amounts to about 10,000/. The design of the building is of a plain, domestic architectural character, with walls of brick, stone dressings to the windows, and tiled roofs. The basement is raised about 7 feet above the surface of the ground for the prevention of damp. The infirmary is designed for fifty-four beds, and is divided equally for the accommodation of males and females. There is a central block containing entrance, two separation wards, surgery and waiting-room, with nurses' duty-room, scullery and larder. In each side block on the ground floor there are two wards with three beds each. On the upper floor in the central block are two children's wards with three beds each. There are glazed alcoves for convalescents and nurses' duty rooms again here. On the upper floor are four nurses' rooms, sitting-room and bathroom. On the first floor of the side block there is one large ward to hold sixteen beds. The heating is by central stoves, with down-cast flues; these have been supplied by Messrs. Shorland Bros., of Manchester. There are airing yards at the back for patients, and the front grounds, about three-quarters of an acre in extent, will be laid out as gardens and recreation-grounds. The building is fireproof throughout, and in addition to the internal staircase there are two external fire escape stairs. The new buildings include a laundry, with receiving room for linen, sleeping-room, hydro-extractor, boiling and rinsing-troughs, steam mangle, &c. The drainage has been carried out on the most modern principles, and that of the old house has been remodelled and joined up to it. The new building is connected with the present kitchens of the old workhouse by means of a covered way. The contractor's work has been carried out by Mr. Gallimore, of Newcastle, from the designs of Messrs. Chapman & Snape, of Newcastle.

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iron pillars to match. The centre gates are surmounted by a fine elliptical arch, carrying three arc lamps, and bearing the name of the exhibition set in finely hammered art metalwork, the whole being judiciously treated with gold leaf. On either side of the entrance are curved wing pieces of massive railing forming a bay for the gates.



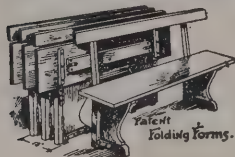
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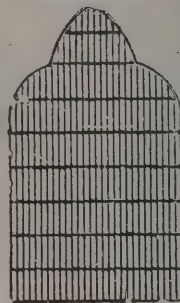
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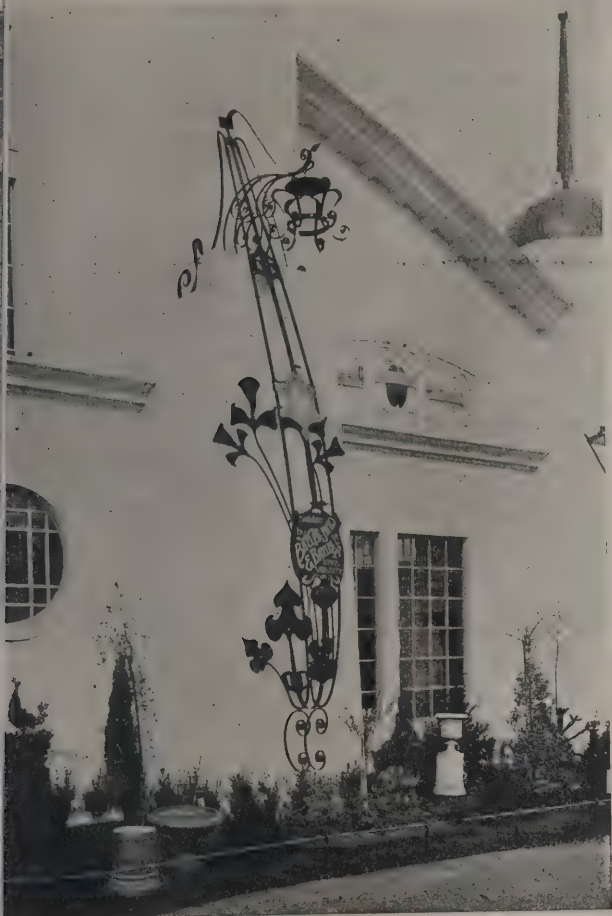
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Two other pairs of gates of similar design and construction are fixed to other entrances.  
In front of the fine machinery hall building, with its centre



ornamental statue of "Industry" over the main doors, are fixed on either side, to give balance and relief to the architectural detail and extent of wall surface, two well-made and very artistic wrought-iron electric lamp brackets, each carrying a lantern head containing seven fifty candle-power lights. These are fine specimens of the smith's craft, each measuring about 23 feet high, relieved with copper and hammered iron shields, the latter bearing the name of the manufacturers. These brackets, with the main entrance-gates and railings and all other gates and railings bounding the exhibition grounds, were manufactured and erected by Messrs. Bayliss, Jones & Bayliss, Ltd., of Victoria Works, Wolverhampton, and Cannon Street, London. We are informed that the whole of this ironwork will be for sale at the close of the exhibition.

#### NEW APE HOUSE AT THE ZOOLOGICAL GARDENS.

A NEW, attractive and commodious dwelling for the anthropoid apes has been erected in the popular gardens at Regent's Park.

This new building, which is quadrangular on plan, each side measuring about 85 feet, occupies a commanding position which it may be said to adorn. It is substantially built and cost about 7,000*l.* It possesses a new feature, and this consists in the complete separation of the part appropriated to the visitors from that in which the animals are confined, by means of a glass screen, which may be compared to a series of shop windows, set end to end without any intervening wall. By this means it will be fairly easy to keep the inmates in a higher temperature than obtains in the part allotted to the spectators, and to prevent their being fed or in any other way harmed by external influences. The apes can be well seen in their new quarters, but the public will miss their cries, for the glass screen shuts out all sound. Immediately within the glass screen run the warming-pipes of the hot-water apparatus, with several up-draughts by which cool fresh air from the outside can be admitted. There are four large cages, each forming a cube, of which the sides are 16 feet. The material is white enamelled brick, with granolithic floors filled in with cement, so that the whole can be easily and thoroughly cleansed.

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The cages are light and airy, but stout enough to hold any anthropoid likely to come into the possession of the Society. They are fitted with barrels for sleeping-places, and stout tree-trunks and swings offer ample opportunity for exercise. A door at each end of the block of cages admits the keepers to the back, where all cleaning and feeding operations are carried on, and between the back of the cages and the hinder wall, near the gull-pond, is a passage for this necessary service, and with doors for shifting the animals or introducing others. The partitions between the cages are furnished with sliding doors, so that the general arrangement may be compared to that of the dens in the lion-house, where all the arrivals are introduced to their new quarters from the back. The house is lighted from above and from the back. The apartments under the house devoted to the animals are large and airy. Some will be occupied as day-rooms by the keeper, others as stores, and one as a hospital, in which sick apes may be kept in small cages, subject to dry or moist heat, as may be thought desirable. The glass screen between the animals and the visitors is quite a new experiment in this country; but according to a recent report of the Council of the Zoological Society, "it has lately been adopted in several ape-houses built in Holland and Germany."

### THE ARCHITECTURAL DEPARTMENT OF THE LONDON COUNTY COUNCIL.

MR. W. WOODWARD has published the following remarks:—Building operations in London have during the last twenty years assumed a magnitude and an importance which have brought them within the category of matters of public interest, and it is a subject of moment to those concerned, and embarking in the business, to see that, whilst the safety and beauty of the Metropolis are properly cared for, no unnecessary obstacle to enterprise is placed in the way, nor avoidable cost imposed by the constituted authorities.

London is governed by several Acts of Parliament, but the two which most concern the building public are the London Building Act of 1894 and the Factory and Workshop Act of 1901, the latter having been prominently brought before the public in connection with the lamentable fire in Queen Victoria Street. Under the latter Act the London County Council furnishes a schedule of its requirements to facilitate escape in case of fire, and from my personal experience

in several cases I assert that whilst the officials are as earnest and as courteous as could be desired, they are quite inexperienced as practical men, with the necessary result that a series of official fads are promulgated which, whilst not securing the object all have in view, entail upon building owners unnecessary cost and delay, secure a mutilation of their premises which most seriously interferes with their profitable occupation and materially reduces their letting value.

The London Building Act of 1894 was hurried through in such a manner that the meaning of many of its provisions is the constant source of doubt amongst lawyers, architects, district surveyors and the London County Council officials. That being so, it is obvious that the administration of that Act should be in the hands of well-experienced practical men, as far as possible removed from bureaucratic notions and from an abnormal love of red tape; but, judging from my own experience, based upon constant mixing with practical building matters during the last thirty-five years, I assert that the architects' department of the London County Council is administered by courteous, well-meaning officials, possessed of very limited experience in actual building operations. The want of real practical knowledge has resulted in requirements which would be amusing if they were not so costly as regards money and time to architects and clients and unnecessary loss to ratepayers. And what does this mean to the public and to the London County Council itself? It means utter contempt for the London County Council by experienced practical architects and a desire on their part to do all they possibly can to avoid going to Spring Gardens at all. It means that they advise their clients to sacrifice all they possibly can to render unnecessary any application whatever to the London County Council. When an architect submits, on behalf of a client, drawings for some constructional work (I am not now alluding to the Factory Act) the duty cast upon the architect's department is to see that all legal requirements are complied with but not to employ, at the expense of the ratepayers, a staff of assistants to make minute calculations of the strength of steel work, &c., when that has already been done by better-qualified men, at the expense of the client, who would be responsible for the making good of future defects should they arise. It is quite obvious that if the London County Council proceeds upon the lines now adopted it will become the bureau for the supply of architectural designs to the public, free of direct charge, and insure forms of construction and strength of materials which will certainly last till the crack of doom.

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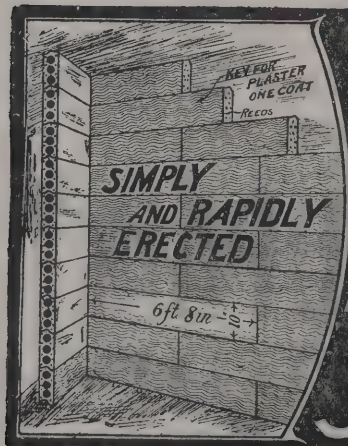
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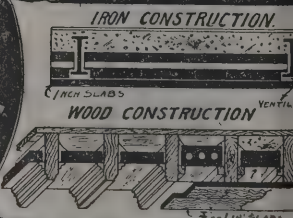
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## DUBLIN MAIN DRAINAGE.

A SPECIAL meeting of the improvements committee has been held to consider the report of the deputation that visited Sir Benjamin Baker, in London, on the 20th inst., with reference to the alleged defects in the deodorisation tanks at the harbour mouth.

The Lord Mayor submitted the following report :—

Gentlemen,—Your deputation, consisting of the Lord Mayor, Councillor Jones, Mr. Chatterton, Mr. Harty and Mr. Hellins, waited on Sir Benjamin Baker on the 20th inst., and laid before him a carefully prepared scheme for dealing with the permanent stability of the main drainage outworks as follows :—

To increase the thickness of the tank floors from a minimum of 12 inches to a uniform thickness of 3 feet 3 inches all over.

Sir Benjamin Baker was asked whether he considered this proposal would effectually provide the permanent stability referred to under the altered conditions which have been found to prevail during the construction of the works.

Sir Benjamin said he was quite satisfied that the proposal was sound and would be effectual, and that he did not consider that a Corporation dealing with public funds could afford to adopt a less costly expedient, although he had no hesitation in stating that if it were a private scheme of his own he would incur the risk, and consider the cost unnecessary. In the case of a public body he thought no risk should be incurred.

The proposals contained in Sir Benjamin's report of the 13th inst. were considered in full again, and were so far modified in favour of the scheme above referred to, and which is based on his views and recommendations.

Sir Benjamin expressed his views that none of the work already done was unnecessary, and further, that all the works executed were of vital importance to the security of the scheme; he also said that had it been possible to have foreseen when the works were designed the conditions we now know to exist, the additional works now recommended must have been included in the original design.

The probable additional expenditure will amount to 17,000l., based on the schedule or contract rates.

Your committee, accompanied by Messrs. Chatterton and Harty, subsequently interviewed Sir Weetman Pearson, the contractor, and discussed the question of the best class of concrete for these works, having special regard to weight and cost. They stipulated that the concrete should not be of a less

weight than that at present in use on the works, and Sir Weetman was informed that a formal order would be given him to execute the additional works in due course.

(Signed) T. C. HARRINGTON, Lord Mayor.  
RICHARD JONES.

The report having been adopted without opposition, the proceedings terminated.

## PORTLAND CEMENT.\*

(Conclusion.)

THE chemical action which takes place in the kiln appears to be as follows. I quote from a paper read by Mr. A. E. Carey, C.E., before the Institute of Civil Engineers, in April, 1892 :—"Chemically, the first effect in burning is to expel the  $\text{CO}_2$  from the  $\text{CaCO}_3$  producing oxide of calcium or caustic lime. This change takes place at 440 degs. C. (824 degs. F.), and the silica and alumina gradually unite to form silicate of lime till a temperature of 700 degs. C. (1,292 degs. F.) is reached, when the alumina comes into action, uniting with the silicate of lime to form a body of complex constitution. The temperature rises to about 1,600 degs. C. (2,912 degs. F.), but this degree of heat should be kept up for a short time only, otherwise a glassy comparatively inert body is formed. The iron, which in contact with the lime fuses at a lower temperature than the other bodies in combination, forms a film upon the clinker of a bluish black colour, and the greenish bloom on a well-burnt clinker is attributed by Dr. Michaelis to the trace of manganese." Any under-burnt portions must be carefully removed when the clinker is drawn from the kiln. Finally, the clinker, which is an inert mass, must be ground so fine that its active setting and hardening properties will fully develop upon the addition of water. It was supposed at one time that only the finer particles of cement (the impalpable powder) were active, and that the coarser particles were inert. Experiments

\* A paper read before the Architectural and Engineering Association of Victoria (Incorporated) by Mr. John Gibson (Manager, Victorian Portland Cement Works, Richmond), and published in the *Building, Engineering and Mining Journal*.

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made a year or two ago by Mr. Butler go to disprove this, and to show that these coarse particles develop a certain tensile strength at later dates, say, from six to twelve months. Although this may, to some extent, be the case, it is certain that these coarser particles must always remain to a large extent inert, hence the necessity for further reduction to increase their utility.

Nearly all cements when freshly made contain a small quantity of uncombined lime, *i.e.* calcium oxide. This lime, if allowed to remain in its active state, would expand upon addition of water, and might thereby cause disturbance of the work in which the cement containing it was used. One object of warehousing is therefore to, what is termed, "mature" the cement, *i.e.* hydrate and possibly thereafter recarbonate by absorption of moisture and  $\text{CO}_2$  from the air any particles of uncombined lime that may be present. It will also readily be seen that fine grinding of the cement clinker greatly assists this operation by causing the particles of cement to be exposed in a state of minute subdivision to the neutralising effects of the atmosphere. "The setting of cement" (I quote from Mr. Butler's book), "according to Le Chatelier, is caused by the formation of a super-saturated solution, which subsequently deposits crystals; the rapidity with which these crystals are formed constitutes the rapidity or slowness of the setting." In other words, the more water is added to cement the more slowly it will set. When water is added to cement, and the mixture is shaken out on a piece of glass or slate, the water rises to the top, and the pat has a shiny appearance. Presently the pat becomes stiff, and loses its glossy skin. It is then said to have "set," and the time that has elapsed between the addition of water to the cement and its disappearance from the surface of the pat is called the time of "initial set." After this has taken place, the pat continues to harden till it will resist the pressure of the thumbnail, or till practically no indentation is made thereon by a Vicat needle, having a flat point 0.1 inch diameter, and loaded with a weight of 3 lbs. The cement is then said to be "hard set." Any disturbance of the cement after the initial set has taken place destroys the formation of the crystals, and has a disastrous effect upon its subsequent hardening. Setting of cement, being a chemical action, is affected by variations in temperature, *i.e.* accelerated by heat and retarded by cold. The fineness of cement has also much to do with the set, *i.e.* the finer it is the more quickly will this action take place. It is consequently apparent that the effect of high temperature, such as we frequently have here in the summer time, upon finely-ground cements may be to

make them so quick-setting as to be quite unusable, and would appear that under certain conditions fine grinding may be overdone.

Cement is tested by chemical analyses for detecting the presence of adulterants. For expansion, by pats made in air and when "hard set," placed in hot and cold water; for tensile strength, by briquettes made with neat cement or cement mixed with standardised sand in certain proportions, and broken at fixed dates, generally 7, 14, 21 and 28 days, 3, 6, 9 and 12 months. These tests, to be of any real value, can only be carried out satisfactorily by a skilled tester, and in a properly appointed laboratory. The ascertained fact that about 25 per cent. of lime in cement separates out in the form of hydrate upon the addition of water has caused investigations to be made, notably by Mr. Michaelis, with a view to, if possible, fixing the hydrate, and thereby adding to the efficiency of the cements, the idea being to incorporate with the cement substances containing soluble silicates which will combine with the liberated hydrate of lime; such substances are santorin, earth, trass and puzzuolana. A legitimate attempt in this direction has been made in the manufacture of what is known as silica Portland or sand cement, which is Portland cement with a greater or less proportion of added quartz sand, the two being intimately mixed, and ground to an extremely fine powder by means of special machinery. Now, the fact remains that quartz sand in its native state contains no appreciable quantity of soluble silica, and, whilst it is claimed that the extremely fine grinding to which the sand is subjected in the process of manufacturing renders it in some degree soluble, very complete and conclusive experiments made by the well-known chemist, Professor Lunge, of Zurich, go to show that up to three months no combination takes place. Such an authority as Mr. Kelway Bamber is, however, of opinion that at later dates chemical combination does to some extent take place. The merit of this material (sand cement) appears to be that the addition of the sand to cement retards the set of the latter sufficiently to permit of its being used with safety, although ground to an impalpable powder. This extremity of fine grinding has the advantages of developing the strength of the cement to the utmost, and by exposing to the neutralising effect of the atmosphere every particle of uncombined lime it may contain renders the cement absolutely free from expansion. There is also the advantage of obtaining denser mortar, owing to the extreme fineness and greater bulk of sand cement, and, further, a prospective increase in strength due to probable com-

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ation at later dates between the finely-ground sand and  
erated hydrate of lime I think there is little doubt that for  
ertain classes of work, notably marine construction, silicated  
ement will be found to be a very suitable material, this view  
ing held by such an eminent authority as Dr Michaelis. In  
s connection I should like to read to you what that authority  
s to say about the action of sea water on concrete :—  
Portland cement, which is not protected by a coat of calcium  
arbonate, and which is not impervious to water, can never  
rmanently withstand the destructive action of sea water in  
nsequence of the action of sulphuric acid salts and even of  
lorides, *eg.*, chloride of magnesium. The sulphuric acid  
its totally destroy the cement through the tendency to 'blow-  
g' caused by the basic calcic sulphate which is formed. The  
loride of magnesium dissolves the lime, chloride of calcium  
ing formed and magnesia separating out." Again :—"Cement  
or in alumina and ferric oxide, but rich in silica, should be  
ed, for aluminate and ferrate of lime are not only decom-  
sed and softened rapidly by sea water, but they also give  
se to the formation of double compounds, which in their turn  
destroy the cohesion of the mass by producing cracks, fissures  
d bulges. The salts contained in sea water, especially the  
lphates, are the most dangerous enemies of hydraulic cements  
he lime is either dissolved and carried off by the salts, and the  
ortar thus loosened, or sulphuric acid forms with it crystalline  
compounds as basic sulphate of lime, which are segregated forcibly  
the mortar, with a large quantity of water of crystallisation,  
and consequent increase in volume results." (Paper No. 2,592,  
Minutes of Proceedings Inst. of C.E., April 1892.) The use of  
silicated cement in marine construction is advocated, (1) be-  
cause its greater bulk is likely to give a dense and, therefore,  
impermeable concrete ; (2) because the lime is reduced to the  
minimum, and there is, therefore, less present to be acted upon  
y the sea water salts ; (3) because the added material is  
early pure silica, which is not acted upon by the sea water  
alts, and which is present in a form probably capable of  
ring the liberated hydrate of lime.

There are, however, other and quite illegitimate additions,  
uch as the practice carried on by some of the smaller Thames  
akers of mixing Kentish rag, a sandy limestone, with Port-  
and cement. Messrs. Stanger and Blount, by experiments  
ndertaken at the instance of the London Chamber of Com-  
merce, have conclusively shown that Kentish rag can only act  
s a diluent, and the best that can be said for it is that beyond  
his, its effect is harmless. This, unfortunately, cannot be said

of another form of adulteration, viz. the addition to cement of  
blast furnace slag. Ordinary slag contains at least 1 per cent.  
of sulphur in the form of calcium sulphide, which, slowly  
oxidising, would be likely to expand in the mass of set cement,  
with injurious results. A cement examined by the writer some  
time ago gave the following analyses :—

Insoluble in HCl	13.8	per cent.
Silica alumina and ferric oxide	27.11	"
Lime	48.90	"
Sulphuric acid	2.06	"
Loss at red heat	6	"

Upon addition of HCl, an unusually large quantity of sul-  
phuretted hydrogen was given off, and the mass had a ten-  
dency to blacken, showing that the adulterant was in this case  
slag. The cement gave low tensile results, some 169 lbs., at  
seven days, and was altogether a most inferior article. The  
danger to the user was that the cement, which was of European  
manufacture, was labelled and sold as a *bona fide* Portland  
cement. Instances such as this emphasise the desirability of  
establishing a public laboratory where users can have materials  
tested and examined for a moderate fee. I think it very possible  
that in course of time an institution of this description would  
derive sufficient revenue from this source to become prac-  
tically self-supporting.

Lastly, the application of Portland cement. The enormous  
increase which has taken place in latter years in the manufac-  
ture of this article indicates the extent to which it is now used.  
England, at one time the home of cement-making, has been  
outstripped in this branch of manufacturing chemistry, as in  
others, by Germany. Cement is largely manufactured in nearly  
every European country, in India, Australia, New Zealand,  
China and Japan. In the United States of America during the  
last few years many cement factories, some of them of great  
size, have been erected, and to-day the output of these is com-  
puted upon a low estimate at some 10,000,000 casks per annum.  
Cement is essentially an engineering and constructional  
material, and it is, I think, a matter for regret that it is so  
largely used for decorative purposes, to the exclusion of the  
warm-coloured brick and sandstone. Cement fronts are far too  
common in Melbourne ; they do not accord well with our  
bright skies and sunshine.

Notwithstanding the universal use of cement, there is,  
unfortunately, a great deal of ignorance amongst users as to its  
nature, behaviour and treatment. It seems an anomaly that a  
comparatively delicate chemical compound, prepared with

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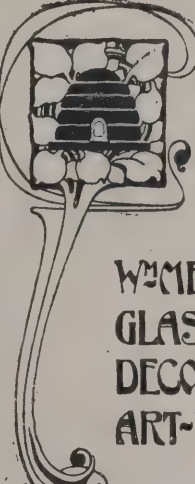


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great care, and by means of expensive machinery, a compound the peculiarities and behaviour of which have been, and are constantly being, investigated at the expenditure of much time, thought and labour by many eminent chemists and engineers, should in too many cases be handed over to the tender mercies of a most ignorant class of labour. I regret I am also bound to say that many engineers, architects and clerks of works are lamentably ignorant of the nature of this material. I have many times seen perfectly sound cement condemned because work carried out with it had failed, the failure being shown upon investigation to be due to the ignorance and carelessness displayed in its application. This, I think, indicates the desirability of more widespread technical knowledge respecting the behaviour and nature of constructional materials. Before closing this paper, I will detain you a few minutes whilst I read in an epitomised form a few directions to users of cement. Take great care that all materials to be used with the cement, such as sand, bluestone screenings, bluestone metal, or other suitable substances are free from earth or clay. Use clean, sharp sand only. Avoid using fine loamy sands. Use clean water only. Mix the cement with the other materials in a dry state, after which add sufficient water to work the whole into a stiff mass. When thoroughly mixed, get concrete into required position as quickly as possible, then ram until water appears on top. Note that it is safer to err upon the side of an excess of than too little water. I wish to especially direct your attention to this point, because upon it there appears to be some conflict of opinion. Some authorities appear to take a view contrary to the one I have expressed; for instance, Professor C. D. Jameson, an American writer, in his book, "Portland Cement; its Manufacture and Use," says (page 112):—"The one thing to be guarded against in the use of cement is the superfluous use of water. There is very little danger in using too little." Now, it is unquestionably the case that the maximum strength is only to be obtained by using exactly the necessary amount of water; also, that any excess certainly tends to weaken the concrete, at least at early dates. I think, however, the two opinions, although apparently equal and opposite, are sound, both in principle and practice, and that they are intended as guides to operators working under different conditions, or, rather, as rules to be observed first in the laboratory, second, on the works. The object of testing cement in the laboratory being to ascertain the greatest strength as well as the defects, if any, of the sample under examination, it is necessary, when gauging briquettes, to guard

against using any more water than is absolutely required, and this for the reason already given, viz. that any excess tends to weaken. But the tester also knows the infinitely greater danger of using too little water, and should the sample under manipulation evidence signs of having been insufficiently moistened, he will at once set it aside and begin anew with a fresh batch. Now, in the laboratory conditions are, one might say, ideal. The manipulator is experienced and skilled, the atmospheric temperature can be regulated, the quantity of cement being handled is small in bulk, and, when gauged there is no delay in getting it into the moulds. Moreover, the briquettes when gauged are kept in a moist atmosphere for twenty-four hours, and are thereafter placed in water.

Now, I need hardly say that on the works such conditions are never obtainable. Delays may take place, allowing the cement to begin to set before the concrete has been got into position. The aggregate, such as broken brick, may be porous, and absorption of water may go on to a dangerous extent after the concrete has been laid. This, added to inevitable evaporation in hot weather, and the subsequent hardening of the cement will be interfered with. Further such work is always carried out by unskilled and unobservant labour. It is the case of two evils—choose the lesser. Unquestionably it is better to have a rather weaker but sound concrete than run the risk of getting an absolutely useless and rotten one. Do not use salt water for mixing concrete or mortar to be used in house construction, also see that sand employed for this purpose is free from salt. The presence of salt in mortar joints or plasterwork causes damp walls. Note that salt retards setting of cement. Do not at any time make up more concrete or mortar than is required for immediate use. On no account attempt to use any concrete or mortar that has been allowed to stand till set. Note that cement sets more rapidly in hot weather. Avoid doing any cementwork, especially rendering, on hot wind days. Keep freshly-made cement work well protected from heat or frost till hard set, in the former case by covering with well-wetted, and in the latter with dry bags. When cementing outside, rake out mortar joints and wet walls thoroughly before applying first coat. Score first coat well and thoroughly wet it before putting on finishing coat. On the day following that upon which the cement plastering has been floated down, and for six days thereafter, drench the work as frequently as possible with clean water. Too much attention cannot be paid to this, particularly in hot weather.

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# The Architect.

## THE WEEK.

A MEETING of the executive committee of the Liverpool Cathedral was held on Monday. It was reported that—  
(a) In answer to the advertisement inviting architects to submit drawings or other illustrations of their works for examination with a view to the selection of the architects to compete in the final competition, 102 portfolios had been received. Of these seventeen are from foreign countries and eighty-five from Great Britain. Of the latter one is from Ireland, eight are from Scotland and seventy-six from England, the latter including eight works of Liverpool architects. (b) That by the courtesy of the Liverpool Library committee the designs are being hung in the vacant rooms of the autumn exhibition, and the selections from those sent in will cover the walls of no fewer than three large rooms. The committee consider that it is undesirable to admit the general public to view the drawings at the present stage, and that it would be fairer to all concerned if the advisers were allowed first to view the designs and drawings with an open and unbiassed mind. These advisers (Mr. G. F. BODLEY and Mr. R. NORMAN SHAW) have arranged to begin their examination next week, and will submit a report to the committee.

OVER half a century has elapsed since the publication of the Ancient Laws and Institutes of Ireland was commenced under Government authority. An extraordinary opportunity presented itself, and to the surprise of many was turned to account. Ireland then had two really great archæologists in JOHN O'DONOVAN and EUGENE CURRY, who were willing to devote the benefit of their lore for less wages than were paid to journeymen. There were other archæologists prepared to participate in the work, but they took care to avoid all the drudgery which was necessary. Ireland was possessed of a body of laws which had been expounded by the judges or brehons. Many of the decisions may have been given prior to the Christian era. Everything was regulated by them; the allotment of pasture, the respective ranks of the members of a tribe, the treatment of strangers, the punishment of crimes, &c. Erics or fines were universal, and were imposed by strict rules. For instance, if a man cut the trunk of an oak, ash or fir tree, he had to surrender five cows; if he injured any of the branches, one that was two years old was sufficient. But for cutting the trunk of an elm, birch or hawthorn the fine was only one cow. Murder on the highway was punished by a fine of twenty-one cows. The definitions of various things suggest the strength of authority. A fence in a field was to consist of a trench, 2 feet in width at bottom, 3 feet in depth, and 3 feet in width at top, with a ditch raised on one side, of these dimensions and materials, viz. twelve hands of stonework 3 feet thick, twelve hands of sod over that, then wooden stakes 2 feet asunder driven firmly into the sod, laced with wattles, and rising three hands over all. To break any part of such a fence was a serious crime, and the penalty was in proportion to the number of stakes removed. The language in which the laws and regulations was expressed is to a great extent obsolete, and the difficulties of translation were immeasurable. This great archæological work has been at length completed, the fifth and sixth volumes having appeared, and the commissioners have a right to say that they have placed in the hands of Celtic philologists and philosophical jurists at home and abroad an important body of materials which must throw the most valuable light on the legal institutions and social system of ancient Ireland.

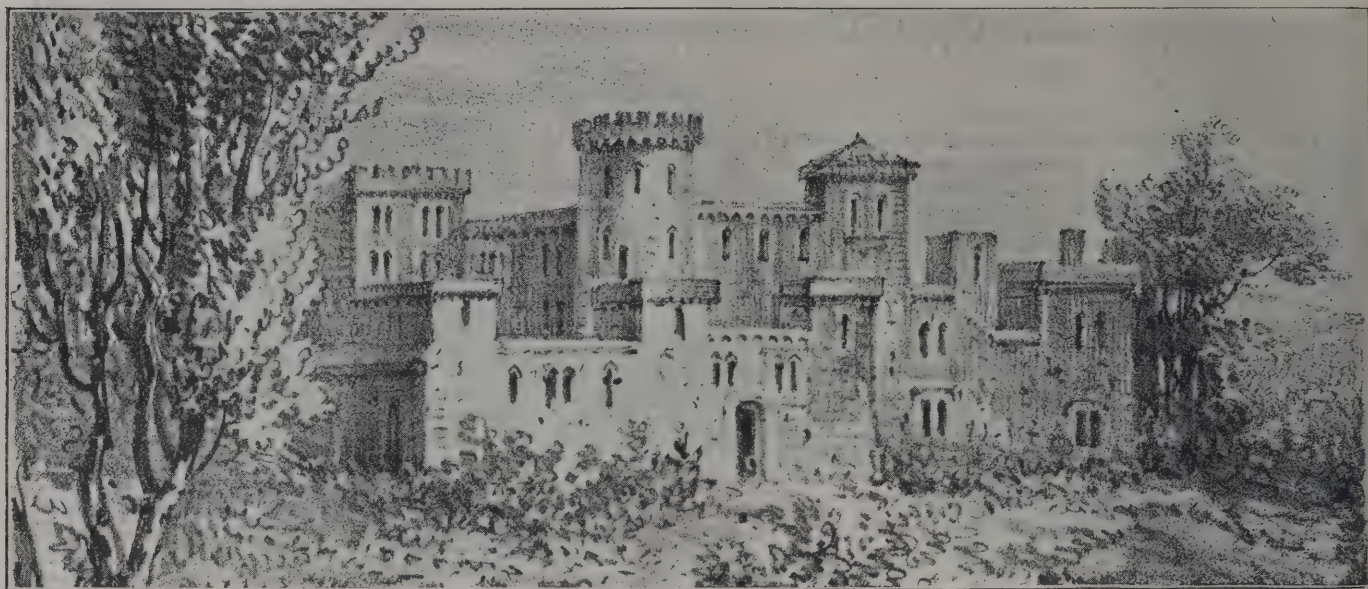
ONE effect of the Workmen's Compensation Act is to make people in general conclude that contractors or undertakers are alone to be held responsible for accidents, and that contributory negligence by other parties is of little or no account. This has been exemplified in the case of GILES v. the Aldershot Urban District Council, which was tried in the Hampshire Assizes. The plaintiff was a work-

ing painter who was engaged by a contractor to paint street lamps. While standing on a ladder at work the lamp revolved, the ladder was moved and the plaintiff fell to the ground, injuring his spine in such a way that he is not likely to recover for several years. If an action of the kind were taken prior to 1897 there is little doubt the plaintiff would have succeeded, for it was the duty of the Council to have ensured that whoever was employed on the work had a safe article to work upon. It was not disputed that the painter was seriously injured. The whole question was on whom the liability should fall, and it was contended by counsel for the defendants that the action should have been brought against the contractor. Is it the duty of a contractor who will only receive a very small sum for painting a lamp to test the possibility of the lamp turning round, or in any other way becoming a source of danger? The manufacturer of the lamps said he did not fix them, and, as the screws and bolts might become rusty, there was a likelihood that motion would follow. The Council by their officers would alone be acquainted with these circumstances. It was maintained for the Council that they were not liable for latent defects, and that the plaintiff used a single ladder instead of a double one. But there were no instructions to use a double ladder. A verdict was, however, returned for the defendants, and it remains to be seen whether, if there should be an action against the contractor, he will be as fortunate as the Council.

"WHAT'S in a name?" is a question which has often given rise to discussion. Every one who has had to arrange the disposal of property will say that the name it bears has much to do with its success as a marketable commodity. A more convincing example of an unsuitable title could hardly be found than the property belonging to the late Sir RICHARD WALLACE in the Bois de Boulogne. The road between Sèvres and Neuilly bounds it on one side; it is near the racecourse of Longchamps, and the Seine is in the vicinity. Yet since the death of the most generous philanthropist Bagatelle has been lying unoccupied because no purchaser can be attracted. The only reason which can be offered is, we imagine, the name. To call beautiful and valuable ground a bagatelle is to suggest there is something trifling about it as a property, or that it was occupied by people who treated everything as bagatelles. The earliest mention of it is as a residence belonging to a daughter of the third Prince de CONDÉ. Then it passed into the possession of the Comte d'ARTOIS, a brother of LOUIS XVI. He made a bet with MARIE ANTOINETTE that he would construct a new château in a month, and he won, but he paid 600,000 francs to the builders. Then came the Revolution, and the "folly" was turned into a restaurant. On the Restoration CHARLES X. obtained the property, which cost him so much. He bestowed it on the unfortunate Duc de BURY, and finally it was acquired by the Marquis of HERTFORD. The château which BELANGER designed has been subjected to some alterations, but it still retains much of the genuine charm of the eighteenth century. The decorations are admirable, and, indeed, its last possessor could not live there unless much that was beautiful met his eye everywhere. Why it remains unoccupied is not easily decided, and the most plausible explanation is that the title is not well adapted to characterise the residence of a millionaire.

A SPECIAL thanksgiving service for the completion of the restoration of the west front of Peterborough Cathedral will be held on July 27. The work of reparation on the west front has been successfully completed, and all scaffolding connected with it was removed some weeks ago. The effort for rendering the west front permanently safe, involving also the strengthening of the foundations of the great transepts, has been carried out at a large cost. But whilst the expense incurred on the west front has been practically met, there still remains a sum of about 1,700*l.* to be raised and spent on finishing the work on the transepts by removing the strong timber supports, by making good all fractures, and generally by perfecting in detail what has been so well begun.





PAINTERS' ARCHITECTURE: JULIO ROMANO.

## THE FIVE ORDERS.\*

**A**MONG the gifts with which antiquity has enriched us we must consider the Five Orders as of especial importance. Not merely have they furnished us with ready-made columns, of which one variety or all may be used at discretion in the same building. Columns were not confined to Greece, and examples could be copied or altered from ancient originals in other lands. But the great advantage of the Five Orders, as we have inherited them from Greece and Rome, is that they provide us with a standard of proportion and of treatment which has been accepted during many centuries by architects. It is true their claim as paragons has been continually disputed, and our own time exemplifies revolt against them. We can see around us columns which do not correspond with any time-honoured examples. In some instances the shafts are drawn out to a remarkable height, as if tenuity were the foremost virtue in a column. All things go by opposites, and stumpy columns are also introduced, and are taken to be evidence of vigorous treatment. Originality, in fact, is by some designers believed to consist in departure from precedents. Whether the change brings an increase of beauty with it which excels what is found in the Classic example is not reckoned. The courage which is shown in the revolt is thought to be sufficient and more characteristic of talent than respect for the forms and proportions which for so many ages gave pleasure to cultivated men.

The old influence is not yet, however, at an end. All the efforts to devise a sixth order have failed. It may seem unworthy in the eyes of reformers that we should still be enthralled to forms which were created at so remote a period, but until something better can be evolved it is no more than common sense to make the best of our inheritance. The circumstance that in our time, when license is encouraged to the utmost, four editions of a volume containing details of the orders have been called for should be enough to persuade the most sceptical to acknowledge that the sway of Classic orders continues to be still powerful over the minds of men.

The reason for this, as we have said, is not merely that we have a supply of pleasing patterns, but that we have also an embodiment of practice that we can prize as a standard. In the orders it has been said the whole genius of the art has been displayed. It is possible that the Greek and Roman architects would be amazed at so much reverence being bestowed on a series of columns which

may not be the best of their respective classes. But in those days there was a pervading opinion which was equal to any formulated standard. What REYNOLDS remarked of academies of art is applicable to the life led by artists in several Greek cities and in a lesser degree in Rome. "Every seminary of learning," the President declared, "may be said to be surrounded with an atmosphere of floating knowledge, where every mind may imbibe somewhat congenial to its own original conceptions. Knowledge thus obtained has always something more popular and useful than that which is forced upon the mind by private precepts or solitary meditation." The variations which we find in examples of the orders testify that the repetition of stereotyped forms was not in favour, especially with the Greek artists, but beyond all other races they contrived to be subservient to opposite qualities, and the limits of the variations denote a respect for authority. What their standard was we can never discover, for the Greeks who wrote books did not at any time condescend to explain the theories of architects, or, indeed, to express much admiration for a building.

Whatever might be the original theory of architectural art, there is no doubt that the Five Orders have served for a sufficiently long period to be established as exemplifying a theory of art. Indeed, without their influence chaos could hardly have failed to have come again. It is only necessary to look at the condition of contemporary painting and sculpture in order to realise how much we owe to VITRUVIUS. Painters and sculptors have nature before them, and they always are willing to acknowledge an admiration for her productions. But countless are the ways in which natural forms are shown. Not to go through the history of art, let us confine ourselves to the most modern period. Between pre-Raphaelitism at one pole and Impressionism at the other pole, there is such a surprising number of interpretations, we can hardly believe that two men see nature under a like aspect or are sufficiently courageous to agree in accepting phenomena in common. It is enough to bring failure to an artist when it is asserted that he views things like one of his brethren. In the representation of commonest scenes individuality is expected to manifest itself, or, in other words, there must be no agreement in the manner of presenting nature to our eyes. In sculpture the variations are no less pronounced, and the recent glorification in England of M. RODIN arose from his daring departures from the styles of all preceding sculptors. Owing to the difficulty of finding a standard of art, it would be hazardous to say that M. RODIN is in error, but if his ways are correct then the Greeks and Renaissance masters, with all their modern successors, must have failed to understand the province of their art.

\* *The Orders of Architecture, Greek, Roman, and Italian. A Selection of Examples from Normand's "Parallel" and other Authorities, with Notes.* By R. Phené Spiers, F.S.A. Fourth edition, revised and enlarged. (London: B. T. Batsford.)



For architecture, nature has supplied no model. Unlike the painters and the sculptors, there is no High Court of Appeal to be found in created things. The ancient Indians and the Egyptians have been thought to express their impressions of nature in colossal and mysterious temples, but that is a subject which it would be hard to determine. The followers of the new art in France and Germany may have some desire to utter thoughts which are beyond the powers of their minds to fathom, but it is only to the initiated that their buildings can have any meaning. From the confusion something clear in course of time may be elicited, and architects have as much right as poets, painters or sculptors to hope that one day they may be enabled "to snatch a grace beyond the reach of art." Meanwhile it seems to be necessary to go through a long period of license exceeding all varieties of rococo.

Without flattering ourselves, it must be allowed that in the present age we are more entitled to hope for a new style of architecture than the majority of our predecessors. We have, at least, analysed all styles, and have drawn or photographed the details of what may be called the provincial idioms of the art. We can take a building in pieces and put the parts together in a new arrangement. Our new combination or combinations, although they might not be accepted generally in England or elsewhere, would, at least, be preferable to those of WILLEY REVELEY or BATTY LANGLEY in the eighteenth century. Theirs were not the only freaks, but the old Five Orders were sufficient to condemn them when they were contrasted, and in all other cases the power of the same arbiters could not be resisted.

Once it was believed that the proportions were settled absolutely and for ever, but it should never be forgotten that in the orders we have much more than a series of proportions. They form as it were an epitome of decorative composition. The fluting suggests what can be done by means of right lines placed at regular distances. As has been well said by REID, regularity expresses design and art, for nothing regular was ever the work of chance. There is also the comparison between vertical and horizontal lines, between planes and curved surfaces. The ornament affords a most marked contrast to the right lines of the mouldings which enclose it. The problems connected with the proportions of the columns are endless, and, indeed, it may be said that the orders alone have been able to engross the attention of the mathematician and of the æsthetician. The interest displayed in the orders during so many centuries could not have been sustained if it were not for the multitude of speculations which a careful study of the forms will inspire. Many have seen in them indications of racial characteristics, and the anatomist as well as the evolutionist have found materials for contemplation in the details. Latterly the development of the orders has been investigated. Yet with all the attention which has been devoted to them it cannot be said that their interest is exhausted.

The architect has to deal with the orders with a view to their application. He may not have the time or skill required for the understanding of the differences between details. It is, however, of importance that he should know there are differences which have been sanctioned by adoption in famous Classic buildings. In that way the adherence to one type of each order which was common in England during the eighteenth and nineteenth centuries will not be regarded as praiseworthy. The extent of parallelism between several types has been exhibited by CHARLES PIERRE NORMAND, the French architect, in a work published in Paris in 1819, which forms the basis of the selection by Mr. R. PHENÉ SPIERS, and which has now established itself in England as a necessity for students. The plates do not need much commentary, for by adopting the system of modules the relation between the parts becomes evident to the eye as well as to the understanding. In the latest edition notes have been added on the origin and development of the orders. Their true history is apparently beyond research. The titles of the three principal orders—Doric, Ionic and Corinthian—may for all we know be incorrect as indications of origin. But it has been ascertained from remains that early Doric bore more resemblance to timber construction than is seen in the columns of the Parthenon. In describing some of the characteristics of the Temple of

Corinth and the Temple of Heræ at Olympia, Mr. PHENÉ SPIERS says:—

The two structures just considered show (A) that the walls of the earlier temples were built in rubble stonework laid in clay mortar or in crude brick raised on a base of stone in two or more courses, and that the outside of the latter was masked or protected by vertical slabs of stone on the outside. (B) That the columns of the earliest peristyle known were in wood, raised on a base of stone rising about 2 inches above the stone paving, and that their wide intercolumniation proved the superstructure to be in the same material. *Note.*—When the wood columns were replaced by those in stone we may assume that their bases were worked off as being no longer required. Mr. Thacker Clarke found a stone Doric column at Assos with its base still existing, and he contends that the base was afterwards merged into the stylobate, viz. the upper step of the Greek platform. (C) The closer intercolumniation of the angle columns would seem to have been suggested by the necessity of having a triglyph at the angle and all the metopes nearly the same size, and indirectly it implies that already at this early period the entablature consisted of architrave, frieze with triglyphs and metopes and a cornice. (D) The antæ and responds were originally in wood, either to protect the front of the antæ, or to assist with the columns in carrying the architrave beam of the portico. (E) The door-posts and lintels were also in wood, and to lessen the bearing of the lintel the door-posts probably inclined inwards, the ends of the lintel projecting beyond either side. The features which we have noted in these two early structures all seem to be based on constructive requirements. We have now to point out briefly how the forms thus created would seem afterwards to have been imitated as decorative features. A explains why in nearly all the Greek temples (those in Sicily are an exception) the outer walls of the cella have a dado of vertical slabs 3 to 4 feet high. The note added to B accounts for the disappearance of the base of a column originally in wood. C became the invariable rule in all Greek temples. *Note.*—There are exceptions to this which prove the rule. In the Temple of Corinth the metope nearest the angle was wider than the others, the angle columns not having been brought sufficiently close together. In the Temple of Ceres at Præstum the intercolumniation of the columns was the same throughout, and a metope found three or four years ago was oblong, being 11 inches wider than the other metopes. D accounts for the stone antæ and responds found in nearly all the Greek temples. E suggests the derivation of the architraves of the Greek doorway, the diminution of the width of the opening of the upper part of the doorway and the shoulder, as it is called, of the lintel.

The Ionic is described as having "two distinct types, one constructional, which had probably a wooden prototype, and the other decorative, with a metallic origin." A primitive example found at Naukratis, and now in the British Museum, was, when first seen, crowned with a volute, which unfortunately has disappeared. As regards the Corinthian, it is suggested that the name was derived from the use of Corinthian bronze for the capitals. The whole of the plates have been reproduced anew from the original engravings and drawings, and there is consequently no sign of the weakness which is observed in plates which are several times reprinted. The volume has gained so much repute it can dispense with further commendation, for it is certain to meet the requirements of more than one generation of students.

#### MODERN MURAL DECORATION.\*

IN dealing with art in its manifold forms sufficient allowance is not always made for that love of change which is inherent in human nature, or at least in modern men and women. Just as epicures become wearied of "toujours perdrix," there are excellent works of art which in course of time fail to please those who have grown familiar with them. A thing of beauty may be a joy for ever, but in most cases it attains that end through a succession of new admirers. To see boredom in its most pronounced form, it is only necessary to go into foreign galleries containing masterpieces and observe the faces of the guardians, especially whenever enthusiastic visitors arrive. This weariness has had divers consequences, and it is the cause of many of the experiments in the restoration of buildings, and especially of churches, which

\* *Modern Mural Decoration.* By A. Lys Baldry. (London: George Newnes, Ltd.)



have aroused so much indignation. There is a marvellous difference between the effect made by forms and colours on people who only see them occasionally, and it may be at long intervals, and on those who are compelled to gaze on them daily or weekly. This fact can be readily tested. Let a man who is familiar with art in public galleries and exhibitions go to some village for a holiday. When he first enters the old church he may be pleased by the change afforded from scenes with which he is acquainted. The attempts at illumination around the walls, the banners and embroidery, the ornament of the local house-painter, will at first gratify him by the desire to express reverence however imperfectly. But on the second or third visit everything will appear to have altered its character, and then the demerits become a distraction. The critic will probably acknowledge to himself that he would not have the strength to endure the spectacle for a year. If he be liberal and can judge others as he judges himself, he must pity the congregation who are compelled year after year to accept such adornment. The same cause may be pleaded in extenuation of the apathy to the works of old masters in Italian churches.

The authorities of foreign galleries, knowing the weakness of human nature, endeavour by rearranging pictures and statues to overcome the weariness and to produce a little novelty. There may be grumbling from those who care only for a few special works, and turn to familiar spots as if by instinct. But the majority of visitors are pleased. There would be an outcry from French amateurs if DA VINCI'S *Mona Lisa* were placed on some other wall in the Salon Carré of the Louvre. The crowds of people who only pay two or three visits to the galleries in a year would imagine they saw new beauties in the portrait if it were hung elsewhere.

The same peculiarity is to be observed in the fluctuations which arise in the value of pictures. MEISSONIER, whose works a few years ago were purchased at the rate of several pounds per square inch, there being an inverse ratio between the area and the price, seems to be now fast declining. Indeed, there is no better test of the variations in public favour than the records of auction rooms. With a cabinet or other easel picture, which cost a large sum of money, and in consequence was allotted the most prominent position in a man's collection, it is possible when there is a change of fashion or of taste to place the work in a more retired space, and in that way it need not be always manifested how unwise was the speculation, how defective the choice.

The facts we have stated should have their influence on the production as well as on the selection of mural decoration. Is there anyone living who is not thankful that the project for the decoration of St. Paul's Cathedral by REYNOLDS and the early Academicians was never realised? Bishop TERRICK was reputed to be an ultra-bigot because he refused to allow the cathedral to be painted in the grand style of Britain, but he is now looked upon as a prelate who was more advanced than his contemporaries. There never was a time when so much enthusiasm about art prevailed as in the days when the decoration of the Houses of Parliament was proposed. How many now regret the ruined condition of the frescoes, or would raise a finger to preserve them? Mr. BALDRY says:—

The artistic conventions which were then affected by the members of the British schools lent themselves but indifferently to the development of the decorative style appropriate to the medium, and the experience which the artists had of the methods essential for fresco was insufficient to enable them to overcome its mechanical difficulties. The paintings began soon after they were finished to show that they were incapable of resisting the climatic and chemical influences to which they were necessarily exposed in such a building, and many of them have since been going through a steady process of degeneration. In a few further instances experiments have been made by other British artists, but generally with little enthusiasm and with scanty encouragement from the public.

It should be remembered that the indifference to the fate of the Parliamentary frescoes does not altogether arise from the failure of the process. It is more owing to the composition and treatment of the pictures. If they were easel pictures or portable they would be hung in offices or committee-rooms, where far better works may be traced,

but as they are painted on the walls they must be tolerated so long as the fresco endures. Why should people be compelled to have decorations which they regard as inferior perpetuated for an indefinite period in spite of their defects? The answer to the question will suggest what is desirable in mural work.

When there is reference to this variety of art it is overlooked that before oil-painting was discovered wall-painting seemed to be the most efficient way of producing pictures. There were undoubtedly panels on wood and on metal at an early time, but on a small scale the effects of the dull colours was not impressive. CIMABUE was the disciple of a Greek mosaicist, and his works show that his experience was derived from employing tesserae rather than brush strokes. Wall-paintings were also desirable as substitutes for books, and long after Greece had fallen the Greek tradition apparently operated, by which it was considered unworthy for a private person to claim entire possession of a work of art. From the positions in which pictures were found—that is, on church walls—and the subjects they represented, the artists were obliged to be reverential or to assume that quality. The works were consequently the best that were obtainable. They could claim to have a close relationship with the buildings, for painting and architecture were assumed to be connected.

In our time there is less gravity of purpose. Decoration can assume a great variety of forms. But the doubts arise more strongly than ever whether it is wise or becoming to confer endurance on a class of forms which would be no less efficient if produced in a transient material. If we take some simpler kinds of wall decoration executed in our time it cannot be denied that they are less beautiful than wall-papering. In the majority of cases few would care to preserve wall-papers after the colours have faded or longer than the agreements in leases prescribe. Is it, then, right to endeavour to impart more durability to what is not so pleasing in appearance? Wall-papers are now subject to the laws of fashion, and it seems inequitable that painted decorations which may be ugly compared with them should be allowed to have no term set to their existence.

The rules should be equally applicable in other varieties of decoration, such as sgraffito, gesso or whatever method is employed for the repetition of forms. The Moors have, perhaps, given us the best lessons about the treatment of geometrical patterns in decoration. No kind of lace appears to be more intricate or puzzling to analyse than some of the plaster and tilework of the Alhambra. An invalid, especially if he is an artist, can hardly refrain from counting the number of forms which are repeated on the walls of his room, and of contrasting the differences between the elements which constitute the patterns. That is impossible with fine Moorish work. We may have read OWEN JONES, and by his aid discovered the simplicity which inspires so much prodigality. But to pursue the unity amidst the marvellous variety seems a task to which no mere spectator is equal. The sgraffito of Signor FORMILI and the gesso panels which recall "argosies with portly sail, like signiors and rich burghers on the flood, or, as it were, the pageants of the sea," by Mr. H. C. BREWER, alone among the illustrations of modern work in Mr. BALDRY'S volume have the exuberance which is desirable in what may be called secondary decoration. Very simple forms are hardly worth the trouble of reproducing in a permanent manner. If stencilling has to be used, it should not be poverty-stricken, but suggest compounds like those of the Japanese, which are inspired by a similar spirit as the Moorish plaster decoration.

Figurework in decoration should more especially be of a class which can combat, if not overcome, that desire for change which is a part of our being. The most remarkable productions of the kind in modern times were those by the late PUVIS DE CHAVANNES. The first illustration of a painting by him which appeared in a journal was one in *The Architect*, for at the time he was not appreciated in France, and none of the French editors would undergo the risk approving of his style. It was not then recognised by his countrymen that decoration ought to be subservient to architecture, and that forms or colours should be used which would make the walls, columns or panels near them become more effective. In most examples of French decoration, as in those by English



artists, the aim is to give prominence to the painting and the architecture is sacrificed without mercy. PUVIS DE CHAVANNES acted on another principle and, in a word, followed Greek tradition. His early decoration was therefore admirable. In course of time there was a change; simplicity ceased to be spontaneous. His figures affected to be unaffected. They were posed in a manner which no men or women would voluntarily adopt, and indeed the figures seemed to have been first modelled for the painter's use by a sculptor. The contrast between the painter of some of the panels in the Panthéon and the painter of the big pictures of the Sorbonne exceeds anything known in the history of art. We have no wish to condemn the artist's later works. He could have made them the elements of a different style of decoration, but the pity of it was he was afraid to abandon his earlier principles, and thus evolved compositions which are neither Classical nor Mediæval, neither Greek nor French, and more sculpturesque than natural.

PUVIS DE CHAVANNES was only one amidst many French decorators. The series from the Paris Hôtel de Ville and the various Mairies we have published will demonstrate the diversity of styles that was encouraged by the municipality. In the majority of cases the selection was by competition, and the number of artists who are capable of excellent work is wonderful. In England the failure of the experiment in the Houses of Parliament obscured decoration for a long time. Prejudice is overcome with difficulty in this country, and it was impossible for anyone to see so many wrecks at Westminster without concluding that decorative art is not suited to our climate or materials. The delay, however, has not been without its compensations. To supply the deficiency of fresco, mosaics, terra-cotta, plaster, gesso, tiles, faience and other ceramics, sculpture in relief, have all received attention, and we are now enabled to adorn walls without any alarm about decay. It should, however, be admitted that some of the painted work is freakish, and not of the kind which a spectator acquainted with art would wish to see standing for ever. Decorative painting is still thought to be a simple, expeditious class of work, and it is not to be expected that a man of business who can easily secure a large sum for an easel picture will be willing to go through the long process of thinking and experiment which is essential for decoration, and perform the work for an insignificant price. Mr. BALDRY'S volume will enable the public to realise that a high class of decoration is obtainable; that class is alone worth execution, and it depends mainly on lovers of art whether the work deserves to survive or should appear in a form that is suited to the season, and which will not be regretted when superseded.

### EXPLORATIONS AT KERMANSHAH.

IN an article in the *Morning Post*, Mr. H. J. Wregham, describing his Persian experiences, says:—On the tenth day from Bagdad I came at noon to the crowded bazaars of Kermanshah. We were joined two days later by M. Pierre de Jecquier and M. Watelin, who were making a cross-country journey from Susa to Paris, where an exhibition of Persian antiquities was to be held. These gentlemen had been particularly fortunate at Susa in finding a large black marble column covered from head to foot with cuneiform inscriptions, which should throw much light on the history of that ancient capital, and they have this advantage over the German explorers at Babylon, that they can take to France everything that they find at Susa. Originally the concession permitted them only to share equally with the Persian Government, but they were molested and attacked by the natives at Susa, and by way of compensation they obtained the right to take everything they require from Susa, though in other parts of Persia the Shah may claim his share. Generally they work four or five months at Susa, and then, before the winter in Susiana gets unbearable, they migrate to the northern parts of the country, where there are ample fields for the explorer. In this way they gradually unfold the history of past ages, and at the same time add considerably to our present incomplete knowledge of Persian geography.

Kermanshah itself is not without its historical remains. There are no more interesting relics in Persia than the rock sculptures of the Shapurs at Tak-i-Bostan, just four miles from the city, and those of Darius at Bisitun, about twenty-five miles out on the road to Hamadan. The first are easily visited in an

afternoon's walk or ride; the second stand right over the caravan route, and are wrought on the face of the great precipice which terminates abruptly the ridge of high mountains facing Kermanshah. In both places a stream of fresh water gushes out from the rock as if the staff of Moses had been employed, from which one might infer that even in the early days of the Achæmenian kings the spontaneous bursting forth of a large volume of water was worthy of the notice of the sovereign in a thirsty land like Persia, if he did not indeed take the entire credit for the phenomenon. Next year a number of French archæologists are to visit Bisitun and treat the work of Darius to a thorough overhauling. Till then the admirable summary of Lord Curzon supplies all the available information on the subject of the Kermanshah rock sculptures.

In other respects the place outside the hospitable walls of the Custom House has but few attractions. There are, indeed, here as elsewhere in Persia, a few striking examples of the wretched improvidence of the people and their rulers. There is the Imadieh, on the banks of the Kara Su River, half-way between the town and Tak-i-Bostan, once a beautiful summer residence, with a lovely garden and well-appointed anderum (women's quarters), built by the Imad-ed-dowleh not forty years ago, and occupied by the late Shah when he made his pilgrimage to Kerbelâ. The story goes that when the famous Governor of Kermanshah offered the palace as a present to his Sovereign, the Shah asked how much it had cost, and, on being told 100,000 tomans, was graciously pleased to restore the gift to its donor and to accept the money value instead. However that may be, the Imadieh is now a complete ruin, where the villagers go to collect bricks, and not a solitary tree is left standing in the once lovely garden.

### CANADIAN SOLDIERS' MEMORIAL FUND.

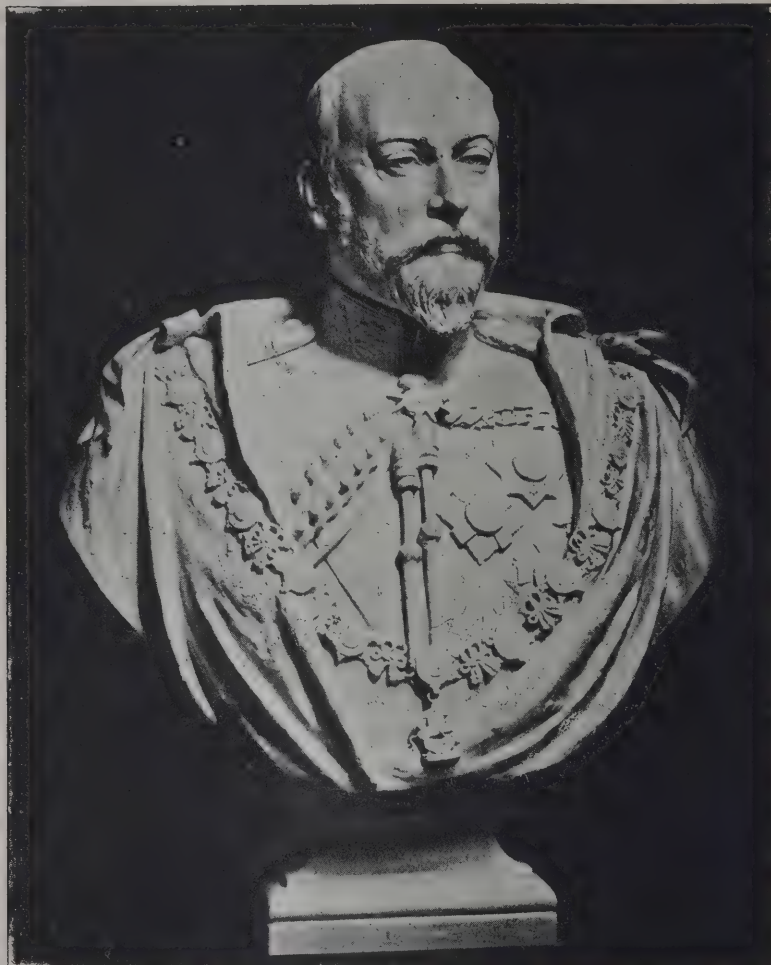
IT is proposed to erect a monument in Montreal in honour of the Canadian soldiers who fought in South Africa, and to commemorate Lord Strathcona's patriotic act in equipping a regiment of mounted troops. The committee invite designs for the monument. These must reach Mr. Davidson, hon. secretary, London and Lancashire Chambers, Montreal, by November 1. The designs must be identified by a motto only and be accompanied by a sealed envelope enclosing the name and address, with the motto only on the outside. An expert will be appointed to aid the committee in their selection. The cost of erection, exclusive of foundations up to the ground level, must be within the money at the disposal of the committee, namely, from 5,000*l.* to 6,000*l.* Competitors may forward a model instead of, or in addition to, drawings, but in case a model is not sent the drawings must include a perspective view, clearly showing the design in every respect. Two prizes of 50*l.* and 25*l.* are offered.

### THE SOCIETY OF ARTS.

THE Council have awarded the Society's silver medal for the following papers read before the Society during the session 1901-2:—At the ordinary meetings—To J. Gordon Parker, Ph.D., for his paper on "Leather for Bookbinding"; to Herbert Stone, for his paper on "The Identification of Wood and its Application to Scientific and Commercial Purposes"; to Professor George Forbes, F.R.S., for his paper on "Range Finders"; to Professor Roberts Beaumont, for his paper on "Recent Inventions in Weaving Machinery"; to E. Price-Edwards, for his paper on "Sound Signals"; to J. Clifton Robinson, A.I.C.E., for his paper on "Electric Traction: London's Tubes, Trams and Trains"; to Major-General Sir John F. Crease, K.C.B., for his paper on "Cuba and Gibraltar"; to Edward T. Scarnmell, for his paper on "The Timber Resources of the Australian Commonwealth"; to H. Warington Smyth, for his paper on "Boats and Boat Building in the Malay Peninsula." In the Indian section—To Professor Wyndham R. Dunstan, F.R.S., for his paper on "The Coal Resources of India"; to Thomas William Holder, C.S.I., for his paper on "The Indian Famine of 1899 and the Measures taken to meet it"; to Thomas Jewell Bennett, for his paper on "The Past and Present Connection of England with the Persian Gulf." In the colonial section—To Commander B. Whitehouse, R.N., for his paper "To the Victoria Nyanza by the Uganda Railway"; to W. T. Preston, for his paper on "The French Canadian Relationship to the Crown." In the applied art section—To S. Alsey Ricardo, for his paper on "The Architect's Use of Enamelled Tiles"; to the Rev. Henry Thurston, S.J., for his paper on "The History of the Rosary in all Countries."

A Commission, consisting of legislators, men of science, hygienists, and nine members of the Seine General Council, will meet to-day to frame sanitary regulations for Paris as regards houses, streets, sewers, water and epidemics.





HIS MAJESTY KING EDWARD VII.

BY WALTER MERRETT.

*From the Bust presented to the Corporation of London by Mr. T. V. Bowater, C.C.*

A MORE opportune time than the present could not be found for the presentation of a bust of the KING to the City of London. HIS MAJESTY'S condition and the courage with which he has borne his illness have endeared him, if it were possible, more than ever to his subjects. Mr. T. V. BOWATER'S gift could not therefore fail of acceptance by the City Lands Committee of the Corporation. The bust has, moreover, qualities which recommend it as a

likeness and as a work of art. The plaster model in the Royal Academy is admitted to be one of the most successful in the Central Hall. It has marvellous plasticity, and is therefore well adapted to the expression on the royal countenance. It will be observed that a national character is imparted to it, for the KING wears the Orders of St. Patrick, the Thistle and the Bath, in addition to the chain of the Sovereign of the Order of the Garter.

#### THE LATE M. BENJAMIN-CONSTANT.

THE Paris correspondent of the *Times* writes:—

May I be permitted to speak once more of M. Benjamin-Constant, whom cruel death forced to lay down his brush at the very moment when the artist shone in all his brilliancy and when for many long years he might have been able to add to his work and to his glory? M. Benjamin-Constant was conscious of his approaching death, and when he was certain that the end was near he said, "I desire that after my death all that remains of my work may be taken to England, to that country which I have learned to love with all my heart, and which has become my second artistic country." Immediately after his death the gracious English Sovereign Queen Alexandra, with that instinctive feeling which distinguishes the minds of those

women who occupy lofty positions, sent to his widow a telegram in the course of which she said, "Your illustrious husband, so loved and esteemed everywhere, and especially in England." Her Majesty thus confirmed the dying words of the artist.

What M. Benjamin-Constant desired should be done is soon to be accomplished. On the 19th and 21st of this month there will be held in one of the London auction rooms a sale of 130 or 140 large paintings left by the eminent French artist and of 60 or 80 smaller works, landscapes, sketched by him in the different countries he visited. I went the day before yesterday to the large studio at Neuilly, where he worked during his latter years. This studio in the Boulevard du Château was formerly used by Puvion de Chavannes, and I believe it was there that the distinguished artist Munkacsy finished some of



his paintings. A great many persons know Benjamin-Constant only as a superior portrait painter. His success in this branch of art has made them rather unfairly forget his admirable collection of Oriental pictures—"Mahomet II.," "Les Chérifas," "La Justice du Chérif," just placed in the Luxembourg, "Les Funérailles de l'Émir," and many others. On my visit to Neuilly I was able to admire some of these pictures, which will now be offered to the public. Prominent among them is a variation of the "Mahomet II.," a real pearl, which may rank among his finest works. Pictures mostly executed in Morocco, and preserving the charm of things really seen and felt, include "Les Favorites," "Les Femmes du Caid," an exquisite canvas full of mystery, "Les Prisonniers Marocains," "Le Roi du Désert," "Une Danse d'Almée," an Arab court with a warm ray of sunshine overlooked by terraces with balconies and sumptuous draperies, "Le Tigre Favori," obviously inspired by a passage in Victor Hugo's "Orientales," Arab interiors, seraglio views, and a number of other sketches. There are also the sketches for large decorative works, such as the entry of Pope Urban II. into Toulouse Cathedral, the resurrection of Lazarus, and the entombment of Christ.

As for the small landscapes, but few people are aware of this phase of Benjamin-Constant's talent. Wherever this great traveller went he made sketches, which he jealously preserved, and these will now be a revelation. There is Venice, red and white, New York, immense London, which he liked so much and the atmosphere of which he has so well grasped, Rome, above all the sea—the waves which he painted as few have done, the sea at night, at dawn, by day, always new, always grand, on which you feel that he allowed his dream to float.

I feel bound, as a duty to readers who worship art, to announce this sale, so that Englishmen may render a last homage to a man whose art seemed always enriched by some new aspect through those frequent visits to England which he said always made his heart throb and rendered his brain active.

## TESSERÆ.

### Composition in Gardening.

GARDENING admits of the application of the principles of composition as regards the ground itself, whether plain or undulating, and of the artistic disposition of objects, whether trees, rocks, plantations, buildings, or beds of flowers. These operations constitute also the elements that are rendered available in compositions of this kind. And the disposal and arrangement of these several forms are capable of infinite variety, alike with regard to shape and colour, and light and shade. The parks and pleasure-grounds of our nobility afford excellent examples of composition in this art. Occasionally, when the character of the country admits of this being done, distant objects and points of view, and even openings for landscape scenery, may be availed of, and, as it were, introduced and embodied in the composition, whether this be effected by cutting down trees, removing buildings, or lowering part of a hill. A distant sea view or the summit of a mountain, when these are conspicuous from the garden or grounds, contributes as essentially to the general effect of the composition as does a tree or a building, or a piece of water standing within its confines. The principles of gardening may, moreover, be applied not only to the laying out of grounds which are expressly ornamental, but to the general improvement of landscape scenery, especially as regards the correction of deformities and the removal of unsightly objects which mar its natural beauties. By the addition of a few trees either to form an object in a particular locality or to introduce new tints in the foliage, by a slight alteration in the course of a rivulet, or by the construction of a cascade in a suitable spot, the whole character and composition of the scenery may be advantageously varied, and nature will be not so much changed as corrected, or rather restored.

### Saracenic Mosaic.

In Egypt Saracenic mosaic is a combination of the tessellated method with the larger proportions of sectile mosaic, but it does not exactly coincide with any of the usual European processes. In its most familiar application, as a dado about 4 feet high, running along the wall of the sanctuary of a mosque or round a principal room in a palace, it consists of upright slabs of marble of different colours and different widths, so arranged as to form a series of rectangular panels, divided and framed by narrower bands. Thus the tomb of El-Ghōry, built in 1503, has a niche inlaid with the yellow and red marbles in zigzag stripes, while the double dado on either side of it, running the whole width of the south-east wall in two lines, one high up, the other low, is of red, yellow and black marbles, arranged in square or oblong panels, the black forming the pattern and the red and yellow the centres and borders of the design. The niche of Kalaūn has black, red and yellow

mosaic, pricked out with little spots of blue tile. It is not uncommon to find fragments of tiles thus used in combination with marble or earthenware. A more usual mode of varying the monotony of the tall slabs of marble and their narrower margins is by introducing between them a border of tessellated work made of small cubes of marbles of various colours, mixed with red pottery or blue enamel, and frequently with mother-of-pearl. The contrasts between the different colours of marble, pottery and glass, and the iridescence of the mother-of-pearl, give this peculiar class of mosaic a beauty of its own which will bear comparison with any other kind of inlay.

### Statuary in Greek Temples.

Dramatic effect in their worship was ever sought by the Greeks, and it was only at special times that their divinities were unveiled at all to the general people. On such occasions every means was taken to work upon the senses. Coloured curtains tinted the light, ceremony lent its impression, and music and the chant their charm. Censers filled the air with their ambrosial vapour, and sacrificial clouds waved before the divinity, like those of his own imaginary heaven, from behind which to the entranced votary well might the mystic god almost or quite seem to breathe, frown or smile. This was a "consummation devoutly to be wished" by the priests, for then the fame of their god increased, and offerings flowed into their treasury. To effect impressions like these doubtless was it that these great statues were painted up to a key of divine life which assuredly could not have been reached by the mere natural tints of ivory and gold. It was to accomplish this that the powers of such as Phidias were thus coerced, and it was under all these devices that these magnificent idols were manufactured in those old days as the agents of polytheism and superstition. Whenever, also, the statue of the god himself in the penetralia of his own marble house was thus treated with the hues of life, doubtless its own immediate subordinates around, especially within the building, had in some degree to wear his livery. Also, when polychromy spread in addition over the exterior architecture, harmony dictated that some variation of colour should be connected also with the outside sculpture, as especially in the backgrounds of the tympana, metopes and friezes. As regards, however, the statues themselves in these situations, the variety of tint was probably confined to that obtained by difference of material, as in shields, swords, helmets and bridles of metal, and not by added surface colour, requiring constant and extensive repairs not capable of being done in secret, as was the case with the interior figures.

### Jerusalem.

No city in the world has been the theatre of such wonderful events. No city ever endured such terrible catastrophes. The first capture of Jerusalem we read of is that by Joshua, about the year of the world 2484; the second that by the people of Jebus, after the death of Joshua; the third that by David; the fourth that by Lesac, king of Egypt, who sacked the city in the reign of Rheboam, 3064 A.M.; the fifth that by Joas, king of Israel, 3210 A.M.; the sixth that by the Assyrians, in the time of Manasses, about 3261 A.M.; the seventh that by Nabuchodonosar of Babylon, in 3436 A.M.; the eighth that again by Nabuchodonosar, in 3446 A.M., when the walls were demolished, the temple, palaces and principal edifices committed to the flames; the ninth that by Antiochus Epiphanes, in 3886 A.M., when the restored city, under Zorobabel and Esdras, was again sacked; the tenth that by Judas Maccabeus, shortly after the former; the eleventh catastrophe when Pompey let loose his army on its inhabitants, in the year of Rome 690; the twelfth similar calamity when Herod of Ascalon took possession of it, but subsequently restored much of its ancient magnificence; the thirteenth that by Titus, when the Divine vengeance made the Romans the ministers of its consuming wrath, in the year of our Lord 70, and all the scourges of war, carnage and captivity, preceded by famine and pestilence, fell on the devoted city; the fourteenth signal calamity that which fell on the remnant of the Jewish people abiding in the ruins of Jerusalem, when revolting against the Romans under Barchochebas, the Jews were put to the sword by the Emperor Adrian, in the year 132, when all of their nation were interdicted the entry into the city of Elia, which Adrian had commenced rebuilding on the site of the ancient Jerusalem; the fifteenth capture was that by Chosroes II., king of Persia, in 614 A.D.; the sixteenth that by the Saracens, under the Caliph Omar, in 647 A.D.; the eighteenth that by the Greek Emperor Zim'es, some years prior to 970; the nineteenth that by the Fatimite Khalifes of Egypt, in 976; the twentieth that by the Soldjuk Turks, in 1071; the twenty-first that by the Fatimites, under Khalif al Moustali, in 1096; the twenty-second capture by the Crusaders, in 1099 A.D., when Godfrey of Boulogne was elected king of Jerusalem; the twenty-third that by the Saracens, in 1187 A.D.; the twenty-fourth by the Turks, in 1244; the twenty-fifth that by the Egyptians in our own times.



### NOTES AND COMMENTS.

WE have from time to time given information about the hardwoods of Western Australia. A pamphlet has just been issued from the Western Australian Agency, under the instructions of the Hon. H. BRUCE LEFROY, which contains the results of employing the woods by various municipalities in this country. In the long list, which ranges from Aberdeen to York, there is a surprising consensus of opinion. Occasionally it is said that a longer trial is desirable; but only in one instance is it mentioned that the paving is not quite satisfactory, and then the explanation is given that the road was in a bad condition, and that a tramway company who were bound to repair it had allowed water to enter under the new paving. In another case the reason is the use of soft woods. In the majority of cases the paving is said to be satisfactory, and sometimes it is announced that an extended use will be made of the wood. The statement has been prepared by Mr. E. T. SCAMMELL, and the object contemplated by the publication is said to be "to assist the trend of opinion in favour of wood paving for city and suburban thoroughfares, and to show the advantages of Western Australian hardwoods for engineering and other purposes, in order to promote the development of an important industry of the State of Western Australia."

THE hot weather in Paris has a surprising effect in making people discover grievances. Usually Frenchmen are indifferent to the fate of their deputies, for if by some catastrophe they were all removed, there would not be the least difficulty in appointing successors. This summer the Chamber becomes a pretext for complaining rather than the members who occupy it. It has been ascertained that there are only 467 square metres in the legislative hall, while there are 581 deputies. The space allotted to each is therefore less than what is exacted in the primary schools for children. It is a very rare spectacle to find all the representatives of the people gathered together, but the hall is condemned because it does not provide for them in the manner which is demanded by sultry weather. It is also asserted that the ventilation is most irregular. The currents of cold air are declared to be intolerable, and if a deputy should seek a refuge in any other part of the legislative palace he runs the risk of suffocation. Yet if theories could accomplish ventilation, there are enough produced every year to make French buildings habitable during all seasons of the year.

It was announced at the meeting of the London County Council on Tuesday that the arbitration with respect to the works ordered to be executed at the Lyceum Theatre had been closed. In October last the theatres committee had served notice in which forty requirements were set forth. The company of proprietors objected and the demands were investigated by Sir WILLIAM EMERSON as arbitrator. With some slight modifications, they have been all confirmed by him, and the works will therefore have to be carried out. It was also announced that upon the recommendation of the theatres committee plans were passed for a new music-hall which it is proposed to erect at the corner of King's Road and Sydney Street, Chelsea. This addition will suggest the change which is taking place with regard to theatres and other places of amusement in the Metropolis. A few years ago a proposal to erect a music-hall in that position would have been looked upon as an absurdity. The Court Theatre, which is the only one in the district, was tolerated because it adjoined a railway station; but people now demand amusements in all parts of the metropolitan area and the suburbs. It is time to put an end to the tedious journeys which were once incumbent on playgoers in London.

At the meeting of the Commons and Footpaths Preservation Society the following resolution was adopted:—"That this meeting, approving of the action taken by the Commons and Footpaths Preservation Society and kindred associations in relation to the enclosure of Stonehenge and the subsequent obstruction of the ancient ways leading thereto, expresses its conviction that no means should be spared to preserve the free access of the public to Stonehenge and the permanent preservation of the monument to

the nation." Mr. SHAW LEFEVRE, who presided, said that the Society contended that the fencing which had been erected was absolutely illegal and ought not to be permitted. The spot had been annually resorted to by large numbers of tourists and others, who had approached the monument on foot or in carriages by several clearly defined and deeply marked ways which started from and terminated in public roads, and the Society held that these were public ways and that the fence was an illegal encroachment and stoppage upon them. The question would shortly be under the consideration of the county council, and the Society were determined to fight it out. If a conclusion can be drawn from the recent inquiry, it seems to be evident that the county council have no desire to contest the rights of the owner of the property, and it is not apparent how the Commons and Footpaths Preservation Society will be allowed the privilege of becoming a combatant in place of the county authorities. It is, of course, to be regretted that the ground around the ruins is not public property and that the stones are not brought under public control, but so long as the law of property remains unaltered Stonehenge will have to be surrounded by barbed wire and approached by the route which the proprietor assigns for the use of visitors.

THE full-size model, which is larger than life, of the statue of the late Empress FRIEDRICH, the British Princess Royal, has been completed by Herr FRITZ GEHRT in Rome. The figure will be executed in marble, and, if possible, is to be completed by October 1903. The site it is to occupy is one of the most important in Berlin, for it will be in front of the Brandenburg Gate. The Empress is represented standing; she wears an Imperial robe and a crown. One hand rests on the band of the mantle crossing the breast, and the other appears to be holding the mantle back by the border. From the expression of the face the Empress might be speaking to a friend, and there is an entire absence of the haughtiness, coldness and severity usually found in such figures. By introducing the rose, shamrock and thistle for the ornamentation of the border the Empress's origin and early life are suggested. Herr GEHRT's model has given much satisfaction to the Roman sculptors who have seen it.

Too many builders take a wrong view of the importance of a tender. They do not realise that when one is accepted by the building owner or his representative, the architect, a contract is entered into which is as binding as any formal document drawn up by lawyers for the purpose. That is the view taken in the English Courts, but a judgment just given in the Scottish Courts is in the same direction. A builder in Hamilton, N.B., tendered to erect a lodging-house for a limited company for the sum of £1,333 7/6, and the offer was accepted. When the work was practically complete he discovered that in transcribing the document one item was made 152% less than it should have been. In the agreement something was said about measurement, and the builder imagined he would be paid at schedule rates. But the company took the view that if the amount had been increased by 152% plaintiff's tender would not have been the lowest, and therefore would not have been accepted. They refused to pay more than the total amount mentioned in the tender. In the Sheriffs' Court judgment was given for the plaintiff, who was held to be entitled to receive payment for the deficiency as extra work at specified rates. In the higher court before Lord Justice-Clerk, Lords YOUNG and TRAYNER, the decision of the Sheriffs' substitute was reversed, and it was held that the contract was for a lump sum, and plaintiff was not entitled to claim detailed prices. The case should therefore serve as a warning, for tenders are sometimes drawn out without realising the responsibilities which are involved in them.

### ILLUSTRATIONS.

PROPOSED TOWN HALL, BOROUGH OF HARROGATE.

CATHEDRAL SERIES.—HEREFORD: VIEW FROM SOUTH-EAST.

RHINEFIELD, HANTS: VIEW FROM THE TERRACE.



## HEREFORD CATHEDRAL.

IN 1877 there was a meeting of the Royal Archæological Institute at Hereford, when the late Sir Gilbert Scott, R.A., read a paper on the history of the building and acted as cicerone. He spoke as follows:—

In giving the history of a great building, it was sometimes the case that the difficulty arose from too great an abundance of information—an *embarras de richesse* of historical facts, and such he dared say was the case when that prince among those who undertook such tasks, Professor Willis, compiled his unrivalled architectural history of Canterbury Cathedral, for in that case the most important parts of its history were so fully and accurately chronicled that Professor Willis must have found difficulty in condensing the materials, rather than in searching them out. At Hereford the case was very different, for here they found almost a nullity of historical information in regard to the building, except what was indirect and uncertain. He had to search, therefore, in every conceivable direction for such mere "waifs and strays" of history as might suggest guesses or theories, or furnish excuses for them, which it was impossible to prove or test. In writing on Hereford Cathedral, in 1841, Professor Willis said:—"It is much to be regretted that the period of no one part of this cathedral has been recorded with the exception of its front foundation." How then could he (Sir Gilbert), who was no investigator of antiquarian documents, venture to give the history of a structure the builders of which, and those who were eye-witnesses of its erection, had neglected to record what they did and what they saw? But having accepted the task he begged their consideration of the difficulty he had met with, for the very paucity of information had increased the labour of seeking it, and poor as was the result, he should be ashamed to tell them the time and labour he had devoted to the task. Their sister society, the Archæological Association, had been before them on this ground, and a paper had appeared in the Journal of that Association, written by Mr. Gordon Hills, which appeared to have so nearly exhausted the documentary information within reach, that he should, with the writer's permission, make free use of it, adding such information as he might have picked out elsewhere.

The see which now took the name of Hereford dated from very early times, and it was likely enough that there was a church of some importance there so early as Offa, the great King of Mercia, who treacherously murdered his son-in-law—or intended son-in-law—Ethelbert, King of East Anglia, somewhere thereabouts, in the year 793, for the purpose of adding his kingdom to his own. Hereford was then known by the name of Fernleigh, and the body of King Ethelbert was brought there for reinterment by a pious noble named Brithfrid. About 830 the church was rebuilt in stone by Milfrid, ruler of Mercia, in honour of the now sainted Ethelbert, and about two centuries later it was rebuilt by Bishop Athelstan, in the time of Edward the Confessor. Athelstan's cathedral was, however, but short-lived, as it was burnt in 1056 by Griffin, the Welsh king, or Bruce, who slew Leofgan, the bishop, and many of his clergy. Leofgan was succeeded by two natives of Lorraine. The first was Walter, nominated by the Confessor, and the second was Robert, appointed by the Conqueror. Robert of Lorraine, commonly called Lozinga, a corruption of Lotharingus, was consecrated in 1079, and he held the see sixteen years. He undertook the reconstruction of the cathedral, which had lain waste since the invasion by King Griffin, and he was said by William of Malmesbury to have built it of a circular form in imitation of the basilica of Aix-la-Chapelle. Now, they knew something of the church he chose for his model. It was a round or polygonal plan, imitated, as it was said, from the church of San Vitale at Ravenna, which had about the year 550 been erected by Justinian possibly in imitation of the Temple of Minerva Medica at Rome, and, more probably still, of the church of the Holy Sepulchre at Jerusalem. All those imitations were, however, but rough ones, and consisted mainly in the adoption of a round or polygonal plan. Charlemagne's church at Aix-la-Chapelle probably still existed, and was in idea very similar to those built afterwards by the Templars in rough imitation of the church of the Holy Sepulchre, which he probably had in his eye quite as much as that at Ravenna. But, however it was, the unfortunate fact remained that they had not in the Norman cathedral here at Hereford a trace or a suggestion of any of those buildings, and if Robert of Lorraine did really imitate Charles the Great's sepulchral basilica, his successors—and probably Bishop Reynelm—must have utterly obliterated his work.

Reynelm held the see from 1107 to 1115. His reputed effigy bore what might be a model of a church, and his *obit* styled him as "*fundator Ecclesie Sancti Ethelberti*," which was altered in a later hand, and he thought erroneously, to "*Hospice*." Writers on the cathedral seemed disposed either to deprive him (Reynelm) of all claim as a builder of the cathedral, or to attribute to him the completion of the work begun by Lorraine. Neither of these suppositions seemed to him (Sir Gilbert) agreeable to common sense. If Robert

of Lorraine completed his design, or if Reynelm completed it, how was it that there was no vestige of anything agreeing with William of Malmesbury's description? Instead of that they had a church in a very straightforward Norman type—apsidal, it was true, but less pronouncedly so than usual, and bearing no resemblance whatever to that at Aix-la-Chapelle. Again, the architecture was not of the earlier Norman type, but that of a more advanced period. Nor did Reynelm complete the cathedral, for they found that this was not finished until 30 years after. He (Sir Gilbert) therefore inclined to the belief that Robert of Lorraine only began the church, and that, being a German, he was proud to do honour to the Imperial basilica of his fatherland; while Reynelm, who was probably a Norman, reverted to the manner of his own country. One could not but regret that Robert's church did not still exist, as it would have been quite unique among English cathedrals. Robert was a learned man in all the wisdom of his age. He was a poet, a mathematician, and learned in the stars and their influence on human affairs, and though intimate with Remigius, the builder of Lincoln Minster, with Walstan, who built that at Worcester, and probably with the builders of Gloucester, Tewkesbury, and other vast churches then rising, he perhaps scorned to follow in their wake, and gloried in imitating the basilica which overshadowed the great hero of his own race. Unhappily, what he had said was all they knew of the building of the Norman cathedral, excepting that it was not finished by Reynelm but by his third successor Robert Bethune or Betun, who held the see from 1131 to 1148, and who having suffered, and his cathedral likewise, during the wars of King Stephen's days, lived to recover and repair the injuries incurred.

The cathedral, then, throwing Lorraine out of the calculation, took forty years in building in its Norman form. The scheme of its design was that its nave had eight bays of not unusual Norman type, supported by massive round pillars to which double shafts were attached both to the north and south. The triforium was of moderate height and good design; the clerestory was somewhat lofty. The choir—or rather the precentory, for the choir proper was beneath the central tower—was of three bays, supported by piers, which were masses of wall rather than columns, and, judging from the great plastering upon their inner faces, he agreed with Mr. Gordon Hills that it must have been vaulted, which was very unusual at that time in churches of so great a span. It terminated eastward in an apse, not formed, as was so frequent, by the swinging round of arcade, triforium, clerestory and aisles upon the altar as a centre, and uniting themselves together in semicircular continuity; but a separate and narrow structure, opening into the presbytery by an arch of moderate dimensions, over which the eastern wall returned in a square form. Each aisle also terminated in a smaller apse, and each of the three apses had its own separate roof. The transepts, of which one only remained, were of an ordinary type, without—at least the remaining one was—the apsidal chapels, which are so usual. He had elsewhere shown that three not distant monastic churches of Gloucester, Tewkesbury and Pershore followed a scheme peculiar to themselves, and displayed great originality of invention. There was no trace of that scheme at Hereford. He was not sure, however, whether the nave here was not more beautiful than that of its more original neighbours. The less lofty columns, surmounted by a well-proportioned triforium and lofty clerestory, formed a more elegant composition than the exaggerated lofty columns of Gloucester and Tewkesbury, which unduly stunted the upper storeys of the nave, though it was possible that the two ranges of aisles in the choirs of those churches, running unbroken round the apse, and the continuous aisle, with its apsidal chapels, may have produced a more pleasing effect than the non-continuous arrangement at Hereford. It mattered little, however, which looked the best. They displayed two quite different systems, each being good and nobly carried out. They saw them now but in imagination, for all those churches had been so altered that the true effect was visible in none.

He had said that the architecture of the cathedral was not early but advanced Norman. Its details in all the principal parts were decidedly rich in ornamental character, and very different from those of Remigius's work at Lincoln, at the consecration of which Lorraine would have been present had the stars been propitious; but no concurrence of stars could have rendered such details as those at Hereford possibly contemporaneous with those of the work of Remigius. He did not believe that a single stone of Robert of Lorraine's cathedral remained in its place. The great glory of the Norman cathedral at Hereford was its west front. It was probably the work of Robert de Bethune, and was consequently very late in style. He mentioned that what little Norman vaulting remained was without diagonal ribs. Possibly Bethune's work was otherwise, as that feature had become frequent in his day. At some time during the Norman period the great timber hall of the Bishop's palace and the curious double chapel of St. Margaret were erected, and St. Catherine's



which adjoined. Bethune's successor was the famous Gilbert Foliot, but though he ruled fourteen years, nothing was heard of him respecting the cathedral.

Sir Gilbert Scott then referred to the great transition in Mediaeval architecture during the time of the three successors of Bethune, and said that the next work done in the cathedral was the alteration of the east end by, probably, his fourth successor, William de Vere. De Vere reigned from 1186 to 1199, just the time of the two greatest Transitional works in the west of Britain, those of Glastonbury and St. David's, so that he was more likely to have been the promoter of the work referred to, as it displayed some marked resemblances to both the splendid structures just mentioned. The older abbey at Glastonbury had been burnt in 1186, the very year of De Vere's accession at Hereford, and the next few years were devoted to the exquisite chapel of St. Mary, now known as that of St. Joseph of Arimathea, while the last decade of the twelfth century saw the rise of the unequalled abbey church itself. The chapel was more Romanesque in its character than the church, though both alike display a refinement of detail and workmanship, and an artistic sentiment which it was impossible to excel. They were the right glorious contemporaries of De Vere's work at Hereford. The work was a very fine Transitional character, with a large supply of that rich semi-Norman decoration which characterised the two great works alluded to; yet with other beauties derived from France, and with evidence, such as the great projection of the foliage of the capital, that it was not quite so early in its style. The great alteration Sir Gilbert Scott alluded to was the entire removal of the three apses and the substitution of an eastern aisle, supplying the deficiency in the first scheme of a continuous aisle or ambulatory round the apse, and the adding to that aisle eastward a range of chapels. The point most open to objection in De Vere's alterations was the blocking-up of the fine eastern arch of the presbytery, by which the interior was deprived of its culminating feature without the substitution of anything in its stead, and the beauty of the choir was most seriously damaged. The reopening of the arch was a work of our own age, and had done much to remedy the radical defect.

They now arrived at the opening of the great thirteenth century, and here they had to start afresh with, if possible, still less direct information than they had hitherto found, though the church was rich in noble work of every part of the century, but every part was left to tell its own tale almost without even the suggestion of a date. He would pass over the mere guess that the first bishop in that century—Egidius de Bruce—built the central tower, the predecessor of that which now existed. It certainly was not the western tower as some had supposed, for no such structure existed before the fourteenth century. First of all came the noble lady chapel. This was wholly undated and unappropriated by any founder. He had come to the conclusion that the lady chapel was somewhat early in its style, because the general details were not Transitional but developed Early English, and that a marked interval must have elapsed between the closing of De Vere's work and the beginning of the lady chapel. It was true that at Lincoln and St. Albans they found developed Early English work at the very beginning of the thirteenth century, but where they had Transitional work of a very pronounced character up to the very end of the twelfth century they could hardly believe that the style at the same places suddenly changed without an interval. He would not, however, venture to assign it to any particular bishop. The bowing down of the vaulting upon the side walls, which necessitated the arcading over the windows, had an Early appearance, but not so as to class it with Transitional work. He should call it a fine design of the earlier period of Early English, though the details of the crypt seemed too late even for that. The next work was the clerestory of the presbytery. It was a specimen of very advanced Early English. The windows had what Professor Willis termed "plate tracery." It was not improbable that the original clerestory and vaulting had become damaged by the unsettling and sinking of the tower, for he could hardly otherwise account for their having gone to the expense and inconvenience of reconstructing so important a part of the building. The style and details of the clerestory were particularly elegant.

They now arrived at a yet more marked era in the architecture of the cathedral. The pointed style made its *début* in the transitional work of De Vere, and they came to the second transition—that from Early English to Decorative—or from first to middle pointed. The windows in the lady chapel were strictly lancet-shaped. Those of the north transept, to which they now came, had bar tracery—that was to say tracery pierced in all its little spandrels and corners so as not to look like a flat surface, but like the bending about of the mullions. This invention was the Magna Charta of Gothic architecture, setting it free from all the trammels of its earlier years. The history of the see about the period when this work was introduced was remarkable, and threw more perplexity than light upon the origin of the great work. It was held from 1240 to 1268 by Peter de Aquabianca, a turbulent foreigner, who came

over in the train of William, half-brother to Henry III. Aquabianca was a favourite of the king, but hated by the clergy, and he was absent from England from 1259 to 1268 in the Holy Land. In 1264 the king, passing through Hereford, found there neither bishop nor clergy, and the church in a ruinous state. He was enraged and reprimanded the bishop, and threatened that if he did not quickly return and mend his manners, he would take the temporalities into his own hands. Aquabianca returned, but only to be taken prisoner and robbed of his wealth by the insurgent barons. He was imprisoned at Ordelay, and he died in 1268. If Aquabianca built the beautiful transept it was difficult to imagine how he came to have the will or the time to do so. Yet that he had a hand in it was certain. His exquisite tomb, which they might be sure nobody would have erected but himself, bears so close a resemblance to the architecture which overshadowed it as to leave no doubt that they were by the same hand. Sir Gilbert then proceeded to point out that the tower was not all built at the same time. He concluded that the work of the lower part of the transept was carried out by the Dean and Chapter in Aquabianca's time, and that it was completed by the two succeeding episcopates, somewhere about 1288. The great faults of the design were the straight-sided form of the arches and the thinness of the details of the triforium, but with those exceptions it was an exquisite architectural design. Sir Gilbert next referred to the shrine of St. Thomas de Cantilupe, and its translation from the lady chapel to the chapel of St. John the Baptist in the aisle of the new north transept, which was partly, he dared say, built by himself, but not until then completed, remarking that they might rest satisfied that it was the *bonâ fide* shrine of St. Thomas of Hereford.

After service in the cathedral, Sir Gilbert Scott gave an historical and architectural description of the fabric. After pointing out the various parts and their features which he had referred to in his paper, which served as an illustration of his remarks, he passed on to other parts of interest in the cathedral. He pointed out as leading from the north porch into the nave a doorway of remarkable design, especially as to the crossing of its arch. It contains all the foliage of the Early English period, and the crisp natural foliage of the Early Decorated, which with other matters he thought showed its age to be about the same as the shrine of Cantilupe. It would follow, therefore, that the porch and the whole north aisle of the nave were built by Bishop Swinfield about 1288. The south aisle, though less ornate, he pointed out to be of the same age or thereabouts, and that consequently Swinfield must have built both the aisles and the nave. He described the style of the nave aisles as "Early Swinfield," and that of the presbytery aisles and the north-east transept as "Late Swinfield." In the north-east transept is the monument which he thought Swinfield in his later days erected to himself. These series of recessed monuments and effigies by which so many of his predecessors were commemorated in the walls of the presbytery aisles were probably owing to him. His death took place in 1315, and the question arose whether he had a hand in the rebuilding of the central tower, which Professor Willis seemed to have thought. He pointed out that two years after the accession of Adam de Orleton, in the year 1319, a remarkable circumstance took place in the history of the cathedral. The Dean and Chapter, supported by the Bishop of Salisbury, petitioned the Pope to sanction the appropriation by the Church of the tithes of the parishes of Shrinfield and Swallowfield, in Berkshire, on the ground that they, the Dean and Chapter, wishing in past times to restore the fabric of the church of Hereford upon an ancient foundation, which the architects and builders of the time thought firm and solid, but which architects and builders in the time of the petitioners deemed to be weak and unsafe. Consequently all the money they had expended on sumptuous work to the honour of the House of God, twenty thousand marks in all, had been to no purpose; for they were now threatened with ruin so severely that there was no remedy to be had, according to the architects and builders, unless the old fabric of the church were totally removed, and on account of that and the expense caused in connection with the canonisation of Thomas de Cantilupe, they were oppressed with various burdens of debt. The Pope replied in the following year—1320—granting them their request, and accompanied it with an assurance of his special devotion to the "blessed Thomas," whose canonisation he had so tardily granted thirty-eight years after his decease. This led them to ask what the buildings were that were constructed on the old foundations, and what on the new? He could only conceive that they were the tower and north transept; and the question suggested itself, what had they done with the money? Sir Gilbert then entered upon a series of speculations as to when and by whom the second tower was built, citing different theories. He said it was of singularly beautiful design throughout, and drew attention to the extremely light work in the upper part, which was necessitated by the great weight of the former tower sinking and crushing all the other work beneath it. Passing on to the more interesting parts of the cathedral, he remarked that the



transformation of the south-eastern chapel into a transept was probably late in the fourteenth century, when the style had much deteriorated. Not long after the beautiful chapter-house and its vestibule were erected with a great revival of artistic taste. It was believed to be 1375. The series of monuments about that time was interesting as showing the gradual passing from the Decorated to the Perpendicular style. Towards 1474 Bishop Stanbury erected his beautiful chapel adjoining the north presbytery aisle. The monuments and effigies of the various bishops were examined, and the beautiful addition made by Bishop Booth, in 1520, to the north porch was pointed out. The futile attempts at remedying the central tower were also examined. Towards the close of the last century the western tower showed such symptoms of impending failure that several architects were consulted and the worst advice accepted, and on Easter Monday, 1768, it fell. James Wyatt was called in, and to him they owed the present western façade, which Sir Gilbert Scott described as about the dulllest piece of work in any cathedral. He also pointed out the latest repairs by Mr. Cottingham since 1840. All the present arrangements of the cathedral which had been made by Sir Gilbert Scott to suit modern requirements were also pointed out by him, and in one or two instances he expressed a doubt whether he would have made such arrangements had he to do the work over again. The cloisters, which contain numerous Norman fragments of stonework, were examined, and the company, which had by this time dwindled down to only a few in number, lastly descended the crypt, and on reascending separated.

### ARCHITECTURE AND THE UNIVERSITY SYSTEM.

THE following evidence was given by Sir Thomas Drew, president of the Royal Hibernian Academy, before the Royal Commission on University Education in Ireland:—

Mr. Justice Madden: Sir Thomas Drew, you are President of the Royal Hibernian Academy?—Yes.

You are a Fellow of the Royal Institute of British Architects?—I am.

As you are aware, we are considering, at the present sittings, the question of university education with special reference to what is called technical education, and you may accept that phrase in its widest sense?—Yes.

Some evidence has been brought before us with regard to the position of the profession of architecture, and to the desirability and possibility of associating the teaching for that profession with a university course of education. We should be glad if you would give us your views on that subject.—I may say that for many years past it is a subject which has been before my mind, and I have had frequent conversations with the late Professor FitzGerald, of Trinity College, who was interested in that subject very much as to the means of the establishment of such a thing in connection with Trinity College. It has been a growing question. No such want existed when I went to serve my time, about fifty years ago, as an apprentice or pupil. The whole scope of the profession has enlarged and developed into something infinitely greater than it was then. It had no literature then, or practically none, you may say; photography had not been invented; travelling had not increased. It is the growth of all these things, and especially the growth of architectural literature, which has caused the demand for education to spring up. The weight of this demand is daily increasing, and it is a very serious question. From my point of view it is absolutely necessary that the architect of the future should have the liberal education which has now become essential for members of the profession.

You speak of "serving your time." Was the usual mode of introduction to the profession that of apprenticeship?—Yes, apprenticeship in the old crafts form, under indentures, and it still is the formal avenue to the profession, for the most part.

What evidence had the public, or have the public now, of the fact that a man who professes to be an architect has received any education, even in the sense of professional education?—There is none, except what has grown up by the necessities of the case, and has been established by the voluntary efforts of the Royal Institute of British Architects, who, there being no other means of doing it, have themselves established a series of voluntary examinations.

Perhaps you would explain to us the constitution of that body. In the first place, how long has it been in existence?—The first association of architects for any common purpose dates from 1837. In that year a charter was granted to the Royal Institute of British Architects, and two years later a charter was granted to a small body of architects in Ireland—the Institute of Architects of Ireland—which, however, did not do very much work. Indeed, for many years during my period these bodies had not been very keen to recognise the necessity for architectural education. It has been a thing of com-

paratively recent growth; but latterly it has become so pressing that the Royal Institute of British Architects during the last ten years have been exceedingly active in establishing a course of education which is entirely voluntary.

Do they give a diploma?—They do.

Is that the result of an examination?—It is the result of an examination or of an architect's known works that he has executed. For instance, I am of such an age and standing that I hold a diploma from the reputation of the works which I have executed. Of course, they would not expect an architect of known and recognised standing to undergo an examination.

Is it a teaching body?—It is not directly a teaching body but it is supplemented by a very powerful organisation in London—the Architectural Association.

What are the functions of that body?—It is a self-educating body of upwards of 1,500 of the younger members of the profession. It is encouraged and subsidised to some extent by the Royal Institute of British Architects, and it is most successful. During the last thirty years it has done a great deal in keeping classes going in subjects outside ordinary office-work. It is very largely and earnestly availed of by young men, and it is exceedingly active and useful in supplementing architectural education.

Are there lectures delivered in connection with the Association?—Yes; there are lectures delivered by outside professors and papers read on different subjects by the members, and there are demonstrations, teaching of water-colours, mineralogy, geology and such like subjects. One of the functions of the Association is practising young men in designing, which perhaps would not fall in with the routine of their ordinary office-work.

Is it your suggestion that the university should take up the work of educating men for this profession and hall-mark their attainments by a special degree or diploma?—I think it is most important that the university should take in hand the literary education of the perfect architect—not the *technique*.

Would you develop that proposition? Do you think that the technical education of an architect should be conducted in an institution apart from the university?—I think the first technical principles and the main technical part of the architect's education must always be acquired by the old crafts system, by serving an apprenticeship. Nothing will give the sense of responsibility, the practical knowledge and instinct, but actual work and actual construction. Theoretical instruction will never impress that upon students.

You would not abolish the apprenticeship system?—No.

You would supplement it?—I think the general feeling of the heads of the profession is that it should be supplemented, and, if possible, strengthened and made obligatory.

Would you develop your scheme of supplementing the apprenticeship system by the adoption of a system of university teaching?—It has been brought to my mind very much. I have had experience of a great many pupils and apprentices of my own, and this education is a crying want. In nine cases out of ten even a decent proper general education is lacking. It is peculiar, I think, to young men intended for the profession of architecture. Their parents or guardians totally misconceive the qualities and the education required. The young men have usually undergone a very ill-advised special education, which does them more harm than good, to the neglect of their general education, which is so exceedingly important to an architect.

Your idea apparently is that, concurrently with the special education acquired by apprenticeship, there should be a course of university instruction?—Yes, certainly.

What inducements would you hold out to students to devote themselves to university studies?—Well, we have already inducements with regard to these voluntary examinations of the Royal Institute of British Architects. The probationary, and some of the minor examinations, are dispensed with altogether in the case of graduates of a university. In fact, their functions as regards those probationary and minor examinations is largely a matter of necessity in dealing with the liberal education of these probationers, and is, I think, outside the proper rôle of the Institute. They have been obliged to apply tests and institute examination, and in general education, and even in ordinary, writing, spelling and so on; and it would be better if they had the assurance that the students had received a good education in some other way.

Do you think the university should give degrees or diplomas in architecture?—I think it should give some testimonium, or some minor degree. I do not think it should be confined to architects only; it might be a degree taken by other intelligent scholars in cognate subjects.

Under a curriculum which should embrace architecture in its highest sense?—Yes; architecture in its history and literature, and so forth.

In that way the practical knowledge acquired by apprenticeship in the master's studio might be supplemented by higher teaching in subjects immediately connected with architec-



ture?—Yes, subjects, for instance, that would give him a greater stimulus and interest in his profession. That is a general want.

Dr. Starkie: What would you call this degree? Would it be a degree in the fine arts?—I think it might be called a degree in architecture.

Mr. Justice Madden: To what extent do you think the candidates for such a degree should take up the ordinary arts course? Do you think they should graduate in arts?—I think they should graduate in arts, certainly.

Would there not be a difficulty then; would not that impose rather a heavy burden upon a pupil in an architect's office, if he were not only to take up the course in architecture in the university, but also concurrently the ordinary arts course?—Well, I have had instances of it. Some few of the best of my pupils took their university degree and went through the course *pari passu* with their apprenticeship.

Dr. Starkie: Did they attend a residential university?—They attended Trinity College.

Did they attend lectures?—They attended lectures sufficiently to graduate and take their degrees.

Mr. Justice Madden: There is another course which might be suggested, and that is that a candidate for a degree in architecture should follow the arts course up to a certain point?—Precisely so.

Possibly after a year of the arts course he should be allowed to specialise?—Yes.

And then his education, so far as the university is concerned, should culminate in a degree in architecture?—Yes; the degree, or certificate, or testimonial, whatever it may be called, would carry weight.

I presume your idea is that in the course of time the public would come to recognise that if they wanted architects of the highest class they should seek them amongst the holders of those degrees?—Yes, I feel very confident of that, because already, under the system of the Royal Institute of British Architects, their diploma is being looked for by the public.

We know there are a great many architects, or persons calling themselves architects, in Ireland, and some eminent and excellent architects. What proportion of the practising architects in Ireland hold the diploma of the Institute?—Well, there are comparatively very few in Ireland. There are fewer than in Manchester or Liverpool or some of those great centres. In Ireland they are a comparatively small body, but I should say that out of the twelve or fifteen architects there may be in Dublin, probably six or eight hold the diploma.

It is very hard, is it not, to say exactly what constitutes an architect?—Yes, precisely so; but during the last half-century the definition has been growing very decidedly.

You apparently would not regard as a member of the profession of architects any person who had not served an apprenticeship to a recognised architect?—No; that is our view—except under very exceptional circumstances.

The expression "qualified architect" has been used. What meaning does that convey to your mind?—It conveys to my mind a man who has served an apprenticeship, and has a certain amount of experience—a good deal of experience, in fact—of practical work, who has executed some works which proved his knowledge.

It has been suggested that a system of registration of architects should be established. For that purpose legislation would be necessary. Does that suggestion commend itself to your mind?—The question of registration has not been before us up to the present time. There have been a small minority of architects who have been for some years trying, in successive Parliaments, to promote a Bill for the registration of architects.

The great difficulty in establishing a system of registration is, that you must start with existing facts. It would be very difficult to exclude from your first register any man, no matter what his qualifications might be, who was in practice as a matter of fact, and then the public would not have the same means of distinguishing between really qualified architects and mere pretenders, as they would have if there were the hall-mark of a degree attached to a complete education in architecture?—Precisely so. There would be the hall-mark of a sufficient liberal education conveyed by that degree—a thing which no registration could convey. Registration could only touch the fringe of technical knowledge.

It must be founded on what exists as a matter of fact, and not on what ought to be?—That is so. It might be of interest to the Commission if I mentioned what I thought might be the subjects embraced by a chair of architecture.

It would be extremely useful.—I hold a very strong opinion indeed that it should keep itself clear of a technical school within the walls of the university, and that the subjects taught should be those of a general education in architecture, such as the history and literature of architecture of the world, the work of all nations, which is now a part of necessary knowledge. I think it is an exceedingly important thing that it should include in addition

a course of modern languages. A crying want of uneducated architects at the present time is a want of knowledge of French or German. It shuts them out of the literature of those countries, and is a great obstacle to learning by foreign travel. That is almost universally a very serious deficiency in young men I have had to deal with. There should also be a certain amount of theoretical teaching in architecture and jurisprudence as connected with architecture. I think it is desirable that a young lad should get some ideas into his head of the law of contracts, the common law relating to building and of the course of decisions in law, of arbitrations and many other things, which I am sure your lordship will understand touch the fringe of the architect's practice. A young man does not acquire a knowledge of these things during his apprenticeship; he must pick up that knowledge for himself by experience. Again, I think the chair might deal very well with the new or modern relations of architecture to public health and sanitation. There are many kinds of knowledge that an architect should possess in that direction. For instance, in regard to modern medical requirements for hospitals, asylums for the insane and that class of institutions, as to which he should have a general knowledge, which, as a young man, he usually has not. Then there is the problem of the housing of the poor; a man might acquire ideas upon that social question before he came to practical building. Then, of course, as we know, one of the great things necessary, and which we should try to get for the young architect, is the power of graphic expression, both by writing and drawing. I think a chair of architecture might do much to develop the literary ability and descriptive power which is not done in practice in the office of a master. I think, too, that the student's interest should be aroused in the fine arts and crafts of all countries, which are ancillary to architecture. He is usually deficient, too, in such things as elementary statics and dynamics, and he has no opportunity of acquiring the knowledge afterwards. Then such subjects as elementary geology and mineralogy he requires some information about, which information he does not obtain in his master's office. That observation applies also to chemistry. In such subjects as these, which he has not the opportunity of learning in his practical apprenticeship, it would be most desirable if his interest were aroused, and knowledge imparted by lectures in a course in architecture.

Most Rev. Dr. Healy: I am not qualified to go into detail in regard to some of these matters, but perhaps you will allow me to ask you one or two questions upon points of general and historical interest. Is there any such thing as an Irish Institute of Architects as distinguished from the Royal Institute of British Architects?—That requires two answers. There is an old institution, of which I have been president for fifteen years—the Royal Institute of Architects—which has been chartered since 1839.

Does that exist still?—Yes, and it is in an exceedingly healthy state, and a system of instruction has been established in alliance with the Royal Institute of British Architects. Some eight or ten great centres have become allied societies, practically blending them in their public acts.

You are aware that during the period of the Irish Romanesque, before the Anglo-Norman invasion, we had a very distinctive school of Irish architecture, had we not?—Yes; a most interesting school.

And that school left some beautiful work behind it, did it not?—Yes.

Of which we have traces in evidence still. That did not come across the Channel from England or Scotland, did it?—No. That is one of the very interesting subjects which might be taken up by the chair of architecture, from the historical and ethnological view.

From that view, of course, that would be most interesting; but what I want to ascertain from you is, do you perceive at present any tendency to the development of a national school of architecture as distinguished from British architecture in Ireland?—I am afraid not; I am afraid the reverse.

Do you think that your suggestions here, if they were adopted—and I hope they will be—would tend in any way to the development of a national school of Irish architecture?—Oh, I think so, enormously; they would get it out of the groove it is in. I have a strong opinion that architecture in Ireland is in a groove, and not a progressive one.

Mr. Justice Madden: By being in a groove, I suppose you mean that it is mere imitation?—Mere imitation at present. I think in Ireland that is rather a weak point. It cannot be said that it is a fault, because it has arisen from the want of means for education.

Most Rev. Dr. Healy: But if we had this scientific and artistic education to which you refer, do you think it would tend to the creation of a national school of Irish architecture?—Certainly.

And one might hope possibly would lead in the future to more beautiful work being executed?—No doubt. And I should say that our establishment of voluntary societies for



self-education has already effected a great deal by unaided effort.

Professor Lorrain Smith: How far would these subjects which you have suggested as forming subjects of study for the degree in architecture require new departments in a university or university college?—I do not exactly know what would be the departments that would be called for. There would be a professor of architecture, I suppose.

Geology, for example, would not require a new department, or chemistry, or dynamics, or modern languages?—No; you would need no additional provision for those.

Then as to the subject of jurisprudence: how would you suggest that provision should be made for that?—Well, that might be done by occasional lectures. Perhaps a member of the Bar might be got to come in and give them.

It might be tacked on to the faculty of law?—Yes.

Then as to public health?—That might be supplied by the medical faculty.

Then with regard to the housing of the poor, that might be dealt with by the chair of economics, I suppose?—By the professor himself, or by some one well versed in the subject—probably an architect.

Then as to the literature of architecture. That might be in connection with the chair of English and modern literature?—Well, I meant to convey more the literature of architecture.

Then you referred to the subject of lucid expression in English?—That would come, in a great measure, under his general education, as a graduate in arts.

Then "fine arts and crafts": I think, probably, that would be a new department?—It would; perhaps an occasional outsider would be brought in to lecture in that.

Could that be united with the architecture of the world?—Yes, it would be part of that.

Those would come under the same department?—Yes.

So that practically you ask for the establishment of one new department and the rearrangement of certain others?—Yes. I think it would be desirable, too, that there should be encouragement, at all events, to take up in the architectural course drawing, not technical drawing, but as a fine art, to get a certificate from the school of art; not architectural drawing—drawing from the life or from the round.

How far would this examination correspond with the present examination for the membership of the Institute?—It would correspond identically, I think. I can hand in to the Commission a synopsis of their examination.\*

I mean, would the Institute allow a substantial part of that examination as a qualification for membership? They do already; I have it with me in print.

That would be an inducement?—It is an inducement. They welcome a graduate in arts from the university, and omit the probationer's examination.

Another point is this: Would the period of apprenticeship be curtailed if a student had passed this examination?—Well, speaking for myself, and perhaps some others, I think that that does not arise in this way; we are of opinion that the apprenticeship has been already far too much curtailed.

Mr. Justice Madden: What is the existing term of apprenticeship?—Sometimes only three years, sometimes four years. In my opinion four years should be the minimum, and it would be much better for a man that he should serve five years.

Professor Lorrain Smith: Is there any objection among architects, such as merchants and manufacturers have, to letting men attend courses at a university at the same time as they are serving their apprenticeship?—No, I think not. I know I have never offered any opposition. Of course attendance at lectures takes a man a little from his work, but I have not found it to be serious. I have always encouraged it.

Do you think that that course would be adopted by the profession?—I think so.

Because there seems to be a very strong opinion amongst manufacturers, for example, against allowing anyone, while serving his apprenticeship, to be at the same time attending lectures?—Well, there are objections certainly, and there are some inconveniences, but my own feeling is that they are outweighed by the advantages.

You would advocate day teaching?—Yes, to such an extent as can be allowed.

A compromise is arranged very often by the technical students going to evening classes?—Yes, that course would be very desirable. Evening classes should be established and used so as to draw a man as little as possible from his daily pursuits.

I want your opinion on that point. One can hardly regard evening classes as of the same standard as day classes, and in arranging to give a degree which involves a liberal education one would be inclined to arrange for day study if possible?—Well, my feeling would be that, suppose I had an apprentice,

he would be withdrawn for a portion of the day once or twice a week to attend lectures, and then, when the time came for his examination for the degree, he should have sufficient time allowed him in the day to sit for the examination. But endeavour should be made to avoid interfering with the daily routine of business as much as possible.

You do not think there would be any advantage to deduct some time from his apprenticeship?—I do not think that would be an advantage. It is seriously felt already that his practical work is too limited. As a rule, it is necessary to raise the enthusiasm and interest of the student in the great profession he has adopted, but I think he should occasionally go into the outer air from his office and hear lectures on the broader view of his profession—that would do him good.

Do you think your opinion would be adopted by the other heads of the profession?—Well, I know the Royal Institute of British Architects will go on with their final examination and diploma, and probably get it legalised.

And probably get it legalised?—And probably get it legalised in time, and it will be the body to confer the complete diploma of master of architecture.

Dr. Starkie: In your summary you hold out the hope that this untechnical course in architecture might be shared by students in other faculties as a subject of educative interest and usefulness. Is it your idea that those students who do not intend to take up the profession should also qualify for a degree in architecture?—I think that would be a question for the university, whether they thought that students who were not graduating in architecture should be excluded from these lectures.

What I was thinking was, that if the history of architecture is to be made an element of general education it ought to be combined with the study of the history of cognate subjects like sculpture and painting.—Those should be part of the architectural course.

Why in that case call it a course in architecture, and not "fine arts"? In Cambridge there is a professor of the fine arts, and so also there is at Oxford?—Architecture I regard as the mother of all arts, and the most inclusive.

Architecture in the time of the Greeks was a term much broader in its significance than at present?—You need not go back to the time of the Greeks, or of the Georges, because architecture has grown to a position it never held in those days.

But at present is not architecture looked upon as having a very definite significance—as excluding, you might say, the study of painting?—He would be a very ill-educated architect now who was not acquainted with the history of painting and of sculpture too.

No doubt; but would you have any objection to the degree being called a degree in the fine arts, for which students whose only aim was general culture should compete?—Yes, I would. I look at it exclusively from the architectural point of view, and to be a thing of value to the students, it should be a diploma or testimonium, or whatever it may be called, in architecture from the university.

I see from your synopsis that you look forward to a final diploma which would be given to persons qualified to be called "Masters in Architecture"?—Yes; that is as well as I could express it.

You have already provided for the technical training of the architect in his apprenticeship?—Yes.

Do you not think that a degree in the fine arts would be of equal value to the architect, if it were known that the course in fine arts included the history of the architecture of the world, in addition to the history of sculpture and painting?—Well, it is of the public I am thinking—its effect upon the public and the knowledge it conveys to the public. The name, I think, is important. A diploma in the fine arts from the university would not convey to the public that which I think we want to have conveyed.

Would there not be a danger, if there was a degree in architecture, of that degree being considered as of more importance than your diploma, which, of course, implies a good deal more?—There should be the greatest care taken that it did not convey that, or anything approaching it.

Usually in Germany and in England a diploma is not considered as valuable as a degree?—It would be simply this, that whatever certificate the man brought from the university would be accepted by the public as a guarantee that he was an educated man outside the technical part of his craft. It would be very important that it should convey no more than that.

Would you be in favour, say, of similar degrees being given in sculpture and painting?—No, I look upon the history of sculpture and painting, as taught by an architectural chair, as quite a kind of by-issue—that the men should have some knowledge of those subjects as forming part of the arts ancillary to architecture. He should not be ignorant of the sculpture and painting of past days.

In some part of your evidence you stated that a great part of the narrowness of the education of architects at present was

\* "The Kalendar of the Royal Institute of British Architects, 1901-2," p. 254.



due to their ignorance of foreign languages, and to the fact that they had not travelled sufficiently. Would you be in favour of the university founding travelling scholarships in architecture?—It would be an admirable thing. We have already done it to a large extent ourselves. We have a number of travelling scholarships to be competed for annually.

Professor Dickey: Would you consider it essential or advisable that an architect should have some knowledge of engineering?—He should, to a certain extent. I can speak with confidence as to that, because I was apprenticed to a civil engineer myself, and in early life had some experience of civil engineering. In my opinion he ought to have a certain amount of knowledge of that subject.

How much should he know—do you mean simply the principles of engineering?—Well, it is a more technical matter; he should learn that in a technical way. He should understand, in common with engineering, iron construction, the calculation of strains on iron, and many of those questions in statics and dynamics which are more essentially connected with engineering.

That might be learnt in the university, I suppose?—I do not think that is very important. It is a subject which he could to a great extent learn from books.

It would not be part of his technical education?—No; I do not think it is worth dwelling on. If he has any use of it in his profession he will be able to master it.

You would not think it necessary to include it in that university course?—No; I would keep it distinctly apart. The two professions have such different aims that to combine them would be only mischievous.

I suppose that practical and theoretical education ought to go hand in hand?—They ought, but in some subjects mere theoretical instruction is, I think, mischievous, and worse than useless.

Take a university consisting of a federation of colleges. Take Belfast, for instance. A young man studying for the profession of an architect in Belfast should have the facilities offered him in Belfast for obtaining the university education necessary?—Yes, it is very desirable that that should be so.

That would mean a chair of architecture, not for the university only, but for each individual college?—I think it would be very desirable indeed, so long as it was always understood that the student was not in any way qualifying as a practical architect, but merely hall-marking his education in a general way.

Are you familiar with the course of study required of students by the Intermediate Education Board?—No, I cannot say that I am. I have taken a general interest in the intermediate education question, but have not studied the details very much.

But you have a general idea of the course?—I have a general idea of the course.

Would it not be possible for a student who had gone through all the stages of the Intermediate Education Board to enter a university, and immediately without any further course in arts, specialise for architecture?—Do you mean with respect to his taking a degree in arts?

With a view to taking a degree in architecture. Would it not be possible for him to specialise directly, without being asked to pursue any further course in arts?—That does not touch my point exactly. Our anxiety is that the future architect should, if possible, get a degree as the hall-mark of his education, wherever it is obtained.

As well as in architecture?—Architecture is looked upon as an additional and special subject. But the deficiency that is met with, and is every day met with more and more, is the want of a good general education outside the technical education. The degree in arts would raise the status of the architect in the community.

Mr. Justice Madden: You contemplate your students, in order to be fully equipped, taking a degree in arts. If a new degree were instituted—a degree in architecture—either of two courses might be adopted:—A student might take that degree along with a degree in arts; that is to say, go in for two courses. But we cannot shut our eyes to the fact that that would be rather a heavy burden, particularly if, at the same time, he were going through a course of practical training in an architect's office. But supposing the degree in arts could be obtained by taking up as one of the subjects the course in architecture which you suggest, would that meet your views?—I think it would be for the wisdom of the university to fix that. I think it would.

What you desire is this. You want to attain a high-standard education embracing an arts course and also a certain degree of specialisation in the department of fine arts connected with architecture?—I think that would be very desirable.

You would regard it rather as a matter for the university to determine how that should be brought about, but it might be brought about by allowing arts students to specialise towards the end of their course in architecture and cognate subjects, taking those subjects up as a constituent portion of the curri-

culum for the arts degree?—That is what I have in my mind. You have put it in a better way, but that is really what has been floating before my mind.

### MANCHESTER ROYAL INFIRMARY.

A SPECIAL general meeting of the trustees of the Manchester Royal Infirmary will be held in the Memorial Hall, Albert Square, on Tuesday, July 22, at eleven o'clock, to receive, consider, and if approved to adopt the report of the Board of Management recommending that the Royal Infirmary be rebuilt upon the present site in accordance with plans submitted, and to authorise the Board to proceed with the work of reconstruction in conformity with the terms of such resolutions as may be passed.

In the report of the Board of Management to the trustees upon the question of rebuilding the Infirmary, it is stated that the committee appointed by the Board have devoted much time and given a great deal of consideration to obtaining suitable plans and estimates for a new building. Particulars of the accommodation required were prepared, in concert with the honorary medical staff, and instructions given to Messrs. John W. Simpson & E. J. Milner Allen, architects, of London—the successful competitors upon the last occasion—to prepare fresh plans for an infirmary to contain 450 beds, without any restriction as to the form of construction, but with the proviso that they were to show how the requisite accommodation could be best provided without seriously reducing (except for temporary buildings during reconstruction) the present extent of vacant land. The Board are now glad to report that the architects have submitted plans, upon the pavilion principle, for a new Infirmary to contain 452 beds without materially encroaching upon the land now vacant. The area of land within the railings which is uncovered by buildings amounts to 13,440 square yards; the proposed new buildings will diminish this existing open space by 846 square yards, or about 6 per cent. only. Accommodation is provided for 179 medical and 273 surgical patients (including, if required, twenty beds for Jewish patients), or a total of 452, as compared with 292 beds now available (viz. 121 for medical and 171 for surgical cases), and for 230 officers, nurses and servants, an increase of 101 on the present staff. Provision has also been made for a splendid out-patients' department, five operating theatres, clinical and bacteriological laboratories, and for an accident department. The materials for the exterior are red brick and stone facings with green-slatted roofs.

The architects estimate that the cost will be approximately 200,000. This sum includes the expense of providing temporary accommodation during the process of reconstruction, but is exclusive of the cost of furniture and fittings, and they state that the time occupied in reconstruction will extend over a period of about six years.

The following is the architects' general description of the buildings:—In this new design the area occupied by buildings is practically the same as that of the selected plans submitted by us in the competition of 1896, though the scheme has been entirely recast; but it may be well to point out that, while the area to be built on is only slightly in excess of that occupied by the Infirmary, the proposed new buildings are so planned that some part of the space at present vacant will be occupied. Against this, however, there remains the compensatory space contained within the open courtyard, which would be readily apparent to anyone viewing the structure from Piccadilly. There is a net difference of 150 yards super additional of building, but since the pathological block containing 261 yards super is now kept nearly level with the ground line, there is practically a gain of 111 yards super of open space. The actual figures are given for comparison:—

1. Total area of site, as given on the block plan issued by the committee, 19,580 yards superficial. Area of existing buildings, as indicated by hatched lines on the said block plan, including porticoes, 6,140 yards superficial. Open space, 13,440 yards superficial.

2. Area of buildings shown on the selected competition design, 6,836 yards superficial.

3. Area of buildings shown on revised design, 6,725 yards. Add pathological block, 261 yards—6,986 yards superficial.

The actual vacant ground is thus 12,594 yards in the revised design, as against 12,744 in that submitted in competition and 13,440 yards now existing. The frontage to Piccadilly has, however, been greatly reduced, thus bringing the vacant ground into the same relative position to the buildings as it now occupies. The actual frontage occupied by new buildings is 103 yards, consisting of a central block of 58 yards with wing blocks of 22½ yards each, separated from the central building by open spaces of 12 yards each; whereas the total frontage of the plan previously approved was 184 yards, and that of the existing Infirmary front is 79 yards. It is hardly necessary to point out the great advantage gained by having three blocks instead of one long continuous line of building. In the revised



design provision is made for 452 patients, an addition of twenty-four to the selected plan. Schedules are furnished showing how the patients are warded and classified.

The following schedule shows the distribution of patients on various floors of the new building :—

	Ground Floor.		1st Floor.		2nd Floor.		3rd Floor.		4th Floor.		
	Rect.	Cir.	Rect.	Cir.	Rect.	Cir.	Rect.	Cir.	Rect.	Cir.	
Surgical—Men	8	20	6	20	2	20	2	20	58	20	176
Do. Women	3	20	12	20	2	20	—	20	—	—	97
	Total										273
Medical—Men	9	—	28	—	28	—	28	—	2	20	115
Do. Women	4	—	4	—	28	—	28	—	—	—	64
	Total										179

A second schedule shows the warding of surgical and medical cases respectively, and a third schedule gives the accommodation in the present Infirmary—102 beds for men and 72 for women in the surgical department, and 60 beds for men and 58 for women on the medical side; total surgical 174, total medical 118; grand total 292.

Accommodation is now provided for 162 nurses and servants, as against 133 in the plan first selected. Although the frontage to Piccadilly unbuilt upon has thus been shortened and the accommodation increased, a further study of the design has enabled us to materially reduce the heights of the main buildings from that first designed. Thus the wall height of the rectangular ward blocks, though containing the same number of storeys (five) as in the competition design, have been reduced from 82 feet, the original height from ground to top of balustrade, to 66 feet. The circular pavilions, which were originally of four storeys only, have now five storeys, without additional (indeed, with slightly diminished) height. This result has been achieved by designing a new type of ward for the top floors. The general section is that of a barred vaulted roof with continuous top light, but with sufficient windows to afford outlook for patients and do away with the impression of confinement which a windowless apartment is apt to convey. The lighting of these wards will, of course, be unexceptionable from a medical point of view. Indeed, the new Victoria Infirmary at Belfast is planned for solely top-lighted wards.

The lessening of the heights has materially helped us in considering the question of adjoining buildings overlooking the site. For detailed descriptions of the various departments we refer you to the printed description which accompanied the selected plans. These remain much as therein described, save for their altered positions in the new design. The operating theatres are, however, now increased to five in number, one being placed in connection with each group of wards, with its proper annexes for anaesthetics, &c. A clinical laboratory, with X-ray and photographic rooms, has also been added to the accommodation, also two rooms for bacteriological research. The lecture theatre has been increased in size, and now accommodates 250 students. A separate department has been arranged for the reception of Hebrew patients, if such should be required. The accident department has been entirely replanned from the competition scheme and is now greatly improved. It forms an entirely distinct group, but is yet in immediate touch with the hospital wards, the medical and surgical officers' apartments and the entrance.

The elevations, to which in the competition design we had been unable to devote the study we should have desired owing to shortness of time, have now been entirely redesigned with a view to more adequately adorning so splendid a site. The materials proposed for the exterior are red brick for the facings with stone dressings and green-slatted roofs.

The intention is to rebuild in sections, so as to interfere as little as possible with the work of the institution during reconstruction. It is proposed by the first contract, which will occupy fifteen months, to pull down the present nurses' house and erect new east and west circular pavilions, out-patients' department and pathological block. The 174 surgical patients (men and women) will then be transferred to the new buildings (the men occupying the west wing and top floor of the east wing and the women the other floors of the east wing), thus emptying the following wards :—Byrom, Gibson, Alexandra, Jenny Lind, Alice, Hall, Humphrey Nichols, Dauntsey-Hulme, Peel, Treasurer's, Derby, Hatton, Mosley, Albert and Thomas Rose. The medical patients (men and women) will be accommodated in the following vacant wards :—Men (64) in Jenny Lind, Alexandra, Alice, Dauntsey-Hulme, and Peel. Women (58) in Byrom, Gibson, Hall, Humphrey Nichols, Albert and Thomas Rose, the last named being extended to hold nineteen beds as the present Mosley ward and the Gibson ward enlarged to the same size as the Jenny Lind, thus giving 122 beds in place of the present 118. In addition, the Louise ward of three beds is retained for isolation cases. (The Gibson ward loses two beds.) Accommodation for the nurses will be provided in temporary buildings in the grounds until the completion of the last contract. The Treasurer's ward will be

temporarily divided into six rooms of similar size to those in present east wing for resident medical officers' bedroom and sitting-room, two house physicians' bedrooms and two house surgeons' bedrooms. The Derby ward will be similarly converted into six rooms for women servants (five bedrooms) and housekeeper's bedroom. The general superintendent will be accommodated in the Hatton ward, and the Mosley ward will be fitted up as five bedrooms for women servants and seamstress's room. The library will be transferred temporarily to the physician's room, the present house surgeon's bedroom, No. 19, being extended by taking in the corridor adjoining, and utilised as resident officers' dining-room, with waitress's pantry and service next it. The displaced house surgeon will be transferred to the treasurer's room, and the collection of models placed in the unused central entrance corridor opposite. The billiard-room will be vacated and used as servants' dining and day-room, and the housekeeper's office removed to the present linen store. The sisters' room between Treasurer's and Derby wards will be converted into a linen store, the kitchen next Hatton ward into a deceased patients' clothes store, and the Hall ward into a mattress and bed store. The foregoing changes clear the east wing of the old building, which may now be pulled down. The reason for first attacking the east wing is that the accident department is thereby left intact for the present. All rooms not specifically mentioned are retained for their present uses. The small (two-bed) wards on top floor of each block in new building to be used as temporary operating-rooms. Temporary connections from the old buildings to the new will be formed on the ground floor, with elevators adjoining the staircases. These elevators will be re-erected in their permanent positions at end of the second contract.

The second contract, which is expected to occupy 24 months, will include pulling-down the present out-patients' department, laundry, mortuary and P.M., and east wing of main building, and building the new east rectangular ward block and the administrative block. The medical patients (men and women) will be transferred to the new east pavilion, the women occupying the first and second floors, and the men the third and fourth floors, thus freeing the old building entirely of patients. The Turkish bath, foreman and carpenter's shop, and general box-room in the basement will be divided into cubicles to form temporary apartments for the porters. The women's dayroom will be used as a temporary chapel. The staff now take up their proper quarters in the new administrative building.

The third contract will, it is expected, be completed in 30 months. Under it will be taken down the present kitchen block and the front portion of the main building, and the casualty department and the approaches from the east side will be built. The casualty department will then remove to its new quarters. The rest of the old buildings will be taken down and the new west rectangular block and nurses' home will be built, thus completing the new infirmary.

The principle of the foregoing scheme, the architects explain, is the transference of the patients to the new buildings at the earliest possible date, and the use of the old buildings for administrative purposes till the moment of their demolition. The working of the hospital will be undisturbed during rebuilding.

The estimate of cost is based on a computation of the cubical contents of the buildings, and is therefore necessarily approximate only. It has, however, been very carefully calculated, and we believe represents within a reasonably small percentage the amounts for which tenders by responsible contractors can be obtained for the several contracts, based on current prices. Some provision, however, must be allowed for the cost of temporary connections, drainage and alterations to the existing buildings during the erection of the new infirmary. It is not possible to ascertain this amount definitely at present, but it would, in our opinion, be prudent to allocate a sum of 8,000*l.* for the purpose, spread over the three contracts.

We estimate the cost as follows :—First contract : Pulling-down present nurses' home and erecting new east and west circular pavilions, out-patients' department, septic wards and temporary nurses' homes, 46,319*l.* Second contract : Pulling-down present out-patients' laundry, mortuary, pathological department and east wing of main building, and erecting east rectangular ward block and administrative block, 71,364*l.* Third contract : Pulling-down remainder of old buildings and completing the new infirmary, 61,139*l.* Total, 178,822*l.* Add provisional sum as above mentioned, 8,000*l.*; grand total, 186,822*l.* The cost of pulling-down is set against the value of the materials obtained thereby. The estimate is exclusive of furniture or fittings.

The Site of the circus in the Champs-Élysées is likely to be utilised for the erection of a large concert hall, which will be designed by M. Umbdenstock.



### NEWCASTLE SOCIETY OF ANTIQUARIES.

A PARTY of members of the Society of Antiquaries of Newcastle-upon-Tyne paid a two days' visit to Falkirk and district last week. Under the guidance of Mr. J. R. MacLukie, F.S.A. (Scot.), they inspected the many places of historic and antiquarian interest in the vicinity. On the Tuesday the party visited Falkirk parish church and churchyard, where the different interesting monuments were pointed out to them, subsequently driving to Callendar House, where, by permission of Mr. Forbes of Callendar, they were shown over the fine country seat by the factor, Mr. Wallace, and also taken through the pretty grounds surrounding. Many objects of antiquarian interest were seen in the house. There was pointed out to them in the grounds by Mr. MacLukie a deep fosse of the Roman wall and of the kame which runs through the policies. A visit was also paid to South Bantaskine, where the site of the Battle of Falkirk of 1746 was viewed. The following day the party were conveyed to the "broch" of Tappock, situated on the summit of the Torwood, about 5 miles north-west of Falkirk, the ancient haven of refuge being described to the party by Mr. Thomas Ross, architect, F.S.A. (Scot.), Edinburgh. The old castle of Torwoodhead, built in 1566 by the descendants of the Baillies of Castlecary, was then inspected. The hills of Dunipace also received attention, and the party had the privilege of visiting Dunipace House, the residence of Mr. Harvey Brown, the well-known authority on natural history. The company then drove to the Roman fort at Castlecary, where excavations are at present being made by the Society of Antiquaries of Scotland. Here the English visitors were joined by a party of antiquarians from Edinburgh, composed of Bishop Dowden, Colonel M'Hardy, C.B., the Hon. John Abercrombie, Dr. Watson, Mr. Ross and Mr. Cunningham, C.E., F.S.A. (Scot.), secretary to the Society of Antiquaries. A description of the interesting Roman remains was given by Mr. Cunningham. The romantic old castle in the vicinity owned by the Earl of Zetland also received a passing visit, after which the party drove by the "via militaris" along the Antonine wall to Rough Castle, where the part of the Roman wall in that vicinity was carefully inspected, as well as the ancient fort itself. Wallside and Tay a Valla were taken on the homeward journey, the party being entertained by Mr. Orr of Kinnaird. Falkirk was reached in the evening, and after dinner in the Crown hotel the party left for Newcastle.

### BRISTOL AND GLOUCESTERSHIRE ARCHÆOLOGICAL SOCIETY.

THE annual summer meeting of the members of this Society was opened at Tewkesbury on Tuesday. At noon the mayor (Councillor T. W. Moore), the Corporation and officials gave the Society a formal reception at the town hall. The Mayor, on behalf of the Corporation and inhabitants, cordially welcomed the Society to the royal and ancient borough of Tewkesbury. The Society had performed, and was still performing, a duty most interesting and important to students of archæology in the country. In the course of his address of welcome the Mayor referred to the ancient abbey with its massive grandeur, which the Corporation of Tewkesbury preserved from destruction by purchasing from King Henry VIII. in the year 1540. He also spoke of the town's possession of examples of Mediæval domestic architecture. The old bridge across the river Avon, known as King John's Bridge—the original of which, built by King John, had no doubt gone in the course of age—was of great antiquity. Queen Margaret's Camp could be seen and the memorable meadow where the decisive battle of Tewkesbury was fought and where fell the flower of the Lancastrian party. A recent discovery had been made in a small house of what was supposed to be the ruins of a portion of the crypt of the Church of St. Mary, which was 200 years older than the abbey, and this would be open to the inspection of the Society. The Mayor, having referred to other features of archæological interest in the town and neighbourhood, ventured to say that the old borough of Tewkesbury afforded more abundant interests for illustration and disquisition than almost any other place in the kingdom.

The general meeting of the Society was then proceeded with, Sir Brook Kay, Bart., being in the chair until the Earl of Gainsborough arrived. The report of the council was read by Canon Bazeley; it stated that the membership numbered 501, and there was a balance in hand of 254*l.* 5*s.* 10*d.*, besides 221*l.* 14*s.* 4*d.* in the bank on deposit account and 632*l.* 3*s.* 8*d.* invested in Consols.

The Earl of Gainsborough, in taking the chair, congratulated the Society upon the number of members present. In responding to a vote of thanks for his services as President during the past year, and for his hospitality on the visit of the Society to Chipping Campden, he spoke of the natural beauty of the Cotswold country, its picturesque scenery, historical associations and beautiful buildings.

The Rev. E. R. Dowdeswell thanked the Society for honouring him with the position of president.

After lunch the Society made a tour of the abbey, and afterwards took tea in the grounds of the vicarage, by the invitation of the vicar and Mrs. Wardell Yerburch. The site of Holme Castle and the old houses were inspected under the guidance of local gentlemen, and at a conversazione held at the town hall in the evening, by the invitation of the Mayor and Mayoress, the Rev. E. R. Dowdeswell gave his presidential address upon the history of Tewkesbury Abbey.

### GENERAL.

The Council of the University College of South Wales and Monmouthshire have appointed a building committee to obtain plans of college buildings to be erected on a site given by the Cardiff Corporation in Cathays Park.

The Artistic Society of French Amateurs will make an excursion to Bruges for the purpose of viewing the exhibition of pictures which is being held in that city. The visit will extend from July 20 to July 30.

The Oxford City Council have had under discussion the judgment recently given by the Recorder, the Hon. A. Lyttelton, in regard to the rating appeals by the University of ten of the colleges and the Clarendon Press. It was ultimately resolved to ask the Recorder to state a case for the High Court.

The French Government have purchased *The Justice of Christ*, which is one of the most remarkable of the late M. Benjamin-Constant's works.

An Exhibition of the arts as applied to industry is to be held next year in St. Petersburg. French work will be largely represented in it.

The Tramway Lines in Berlin are now worked by electric power without exception. There is not one on which horse traction is employed.

The Lord Chancellor has come to the conclusion that no useful purpose will be served by an independent inquiry into the working in London during the past four years of the system of registration of title to land under the Land Transfer Act, 1897.

An Appeal has been made for 20,000*l.* in order to build a new cathedral for Pretoria.

The Receipts from visitors to the Salon have amounted this year to 328,000 francs, being the largest sum received for admissions since 1888. The rival society has also obtained an increase of 15,000 francs over last year's receipts. Neither exhibition attained average merit in its works.

The Norfolk County Council used 22,322 tons of granite on its roads last year, and most of it was derived from Belgium owing to the low cost of carriage, which enabled it to compete successfully with English. The average cost of the foreign granite delivered at the various places required was 11*s.* 1*d.* per ton.

An Exhibition of examples from the French national pottery at Sèvres will shortly be open in the Grand Palais of the Champs Elysées.

Mr. Donald A. MacAlister, F.G.S., has been appointed geologist to His Majesty's Government, to undertake special investigation in the mining districts of Cornwall.

Mr. W. F. Faviell, M.I.C.E., who died on Thursday in last week, was the contractor who, in conjunction with his partner, Mr. Fowler, constructed the first railway in India, from Bombay up the Ghauts towards Poona. He also carried out the line between Colombo and Kandy. His last contract was in South Africa in 1877, where he undertook to extend the Port Elizabeth railway into the interior in the direction of Cradock and of Graaf Reinet.

On Wednesday last the only daughter of Mr. Thos. Dinwiddy, F.R.I.B.A., F.S.I., of Blackheath and Walmer, was married at Greenwich to Mr. Stanton Freeland Card, R.N., B.A. The Bishop of Southwark, with the vicar and other clergy, officiated. A reception was afterwards held at the Manor House, Blackheath, and attended by 250 guests. The presents were numerous and costly, numbering over 180.

Mr. Ernest Day, F.R.I.B.A., architect and surveyor, of 5 Foregate Street, Worcester, is removing to more convenient offices at 6 Sansome Place, Worcester.

M. G. Dubufe, painter, will prepare the report on the works of contemporary artists at the Paris Universal Exposition of 1900 under the direction of M. Gérôme.

A Memorial Statue of Mr. E. Onslow Ford, R.A., provided by public subscription, is to be placed at the junction of Grove End Road and Abbey Road, St. John's Wood. An influential committee have the project in hand, and the care and maintenance of the memorial after completion will be entrusted to the Marylebone Borough Council.

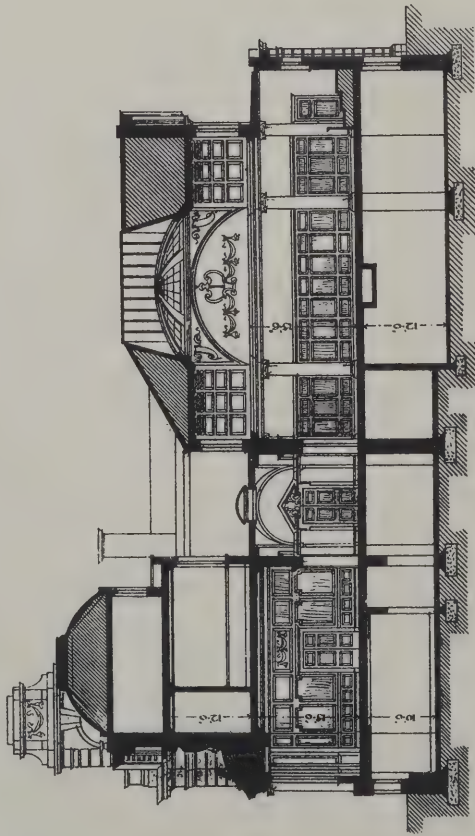


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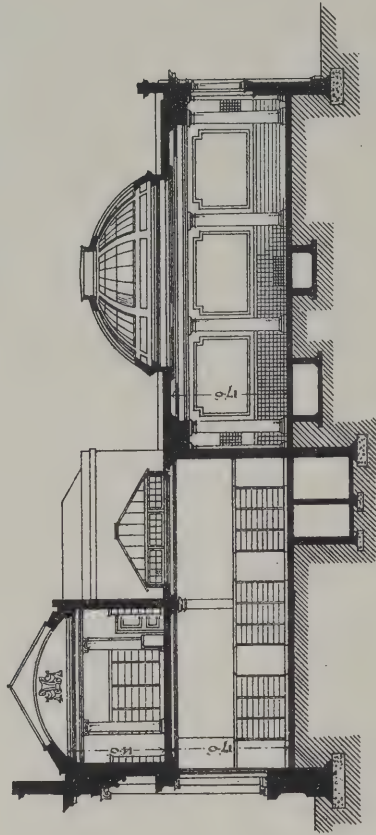


BOROUGH OF HARROGATE:  
PROPOSED TOWN HALL:

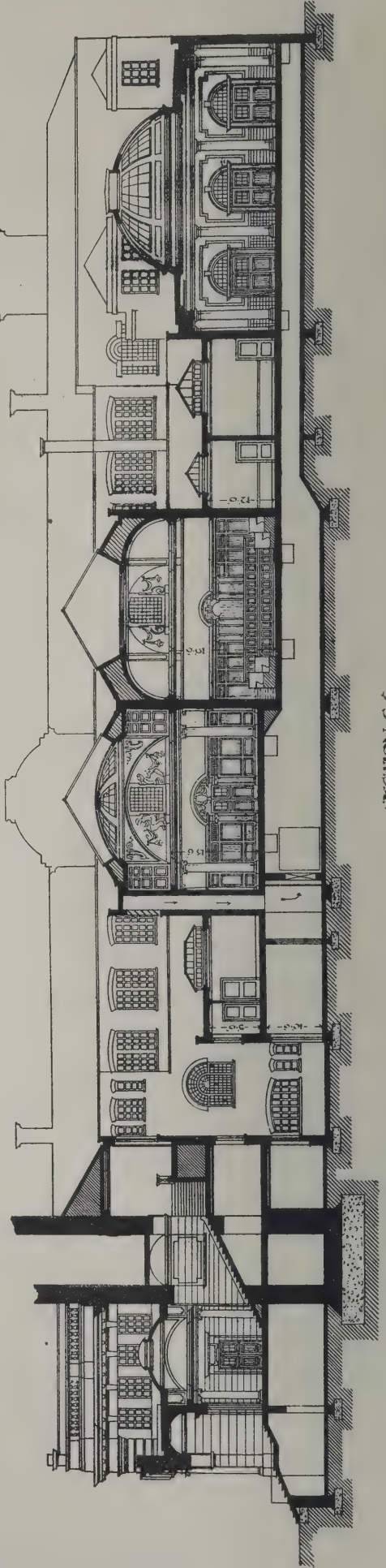
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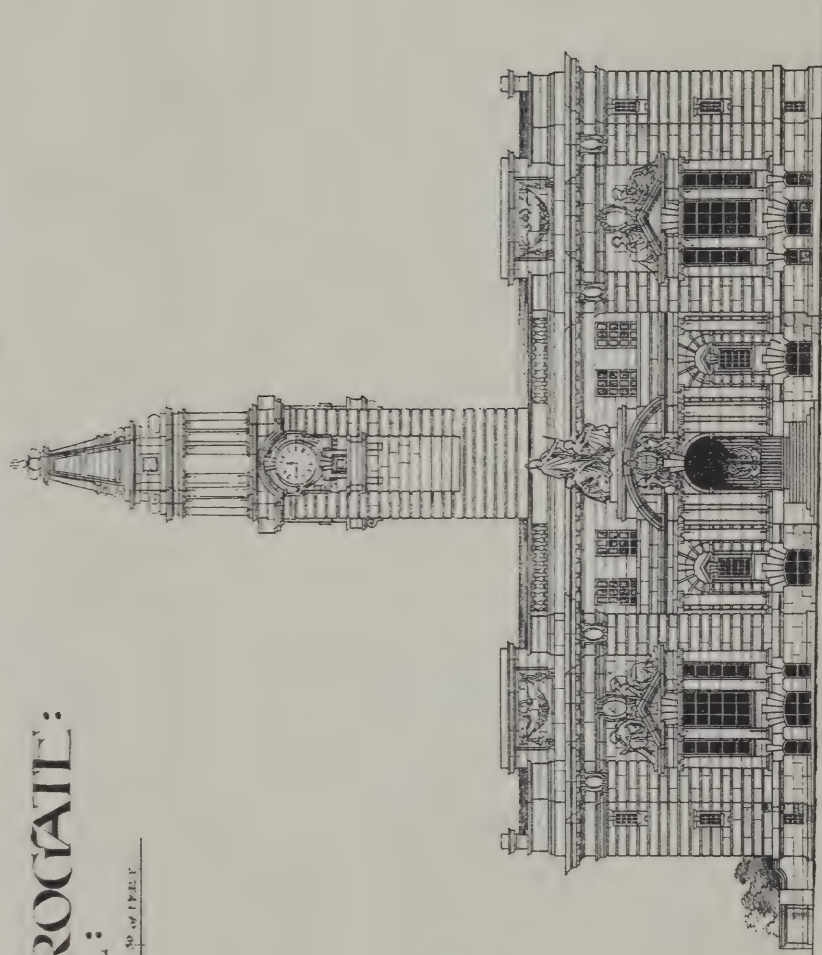
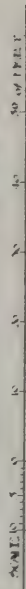
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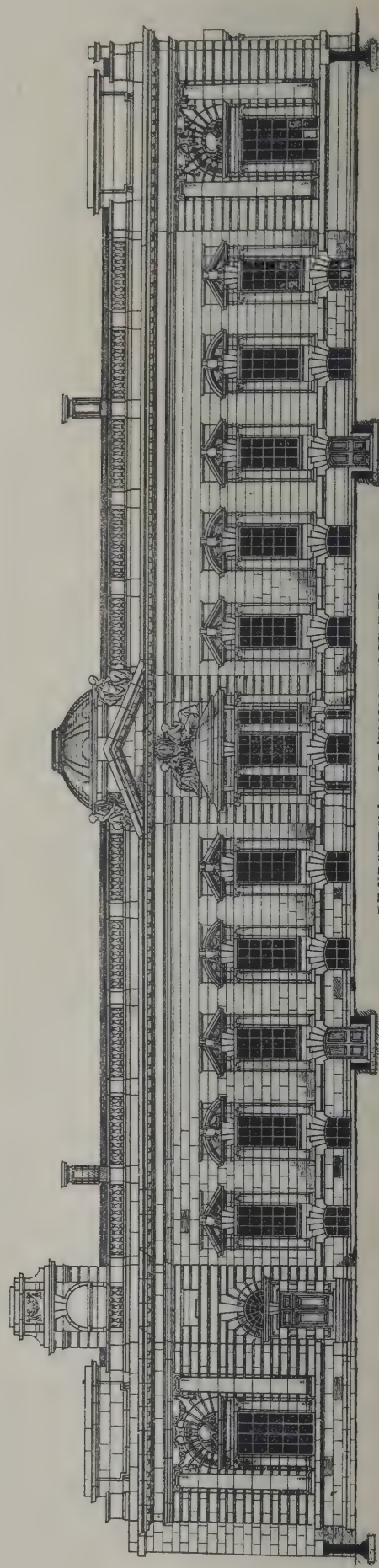
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BOROUGH OF HARROGCATE:  
PROPOSED TOWN HALL:



ELEVATION TO STATION PARADE



ELEVATION TO VICTORIA AVENUE

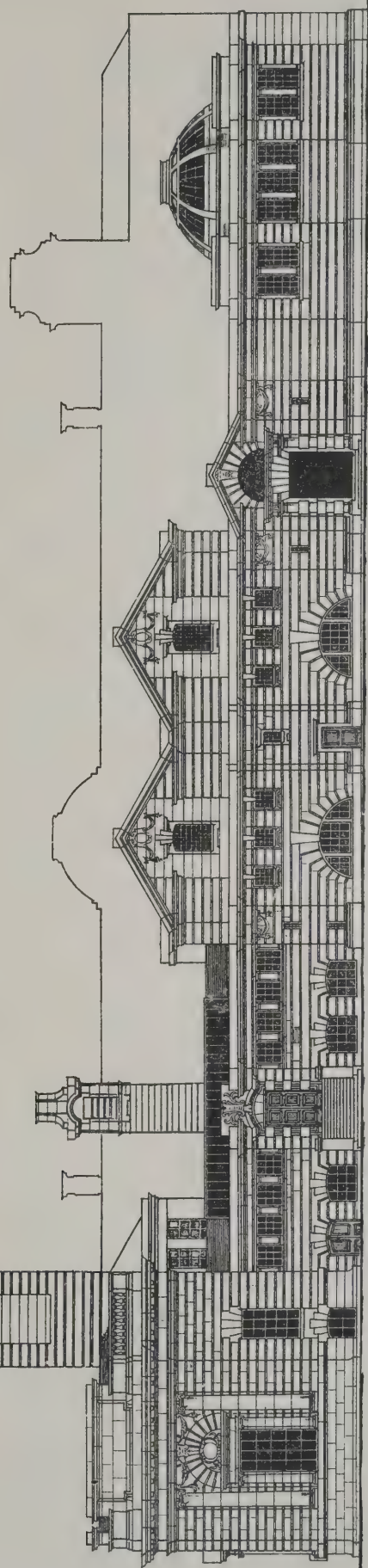
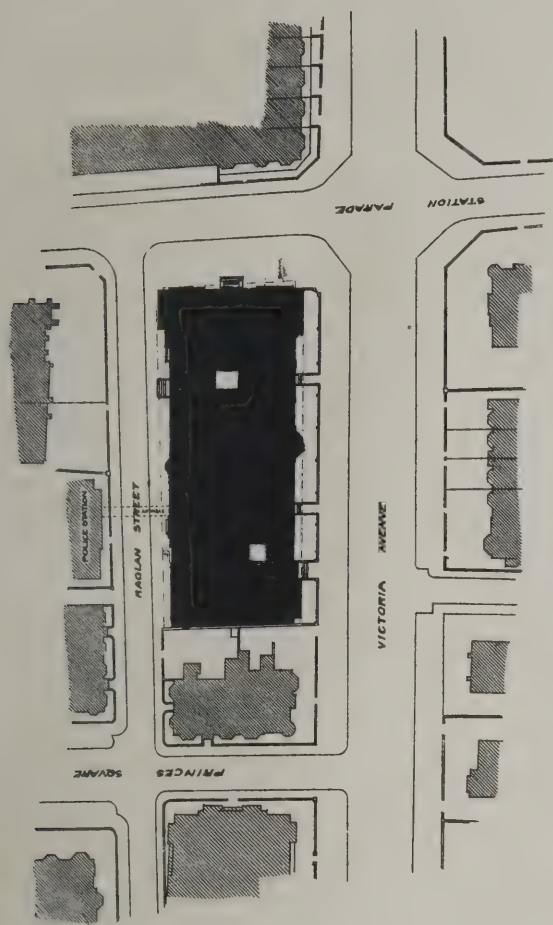


**BOROUGH OF HARROGATE:  
PROPOSED TOWN HALL:**

Scale 1" = 20' 0"



BLOCK PLAN:



ELEVATION TO RADIAN STREET:



PHOTO-LITHO. SPRAGUE & CO. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

FIRST PREMIATED DESIGN.

By H. T. HARE, F.R.I.B.A.





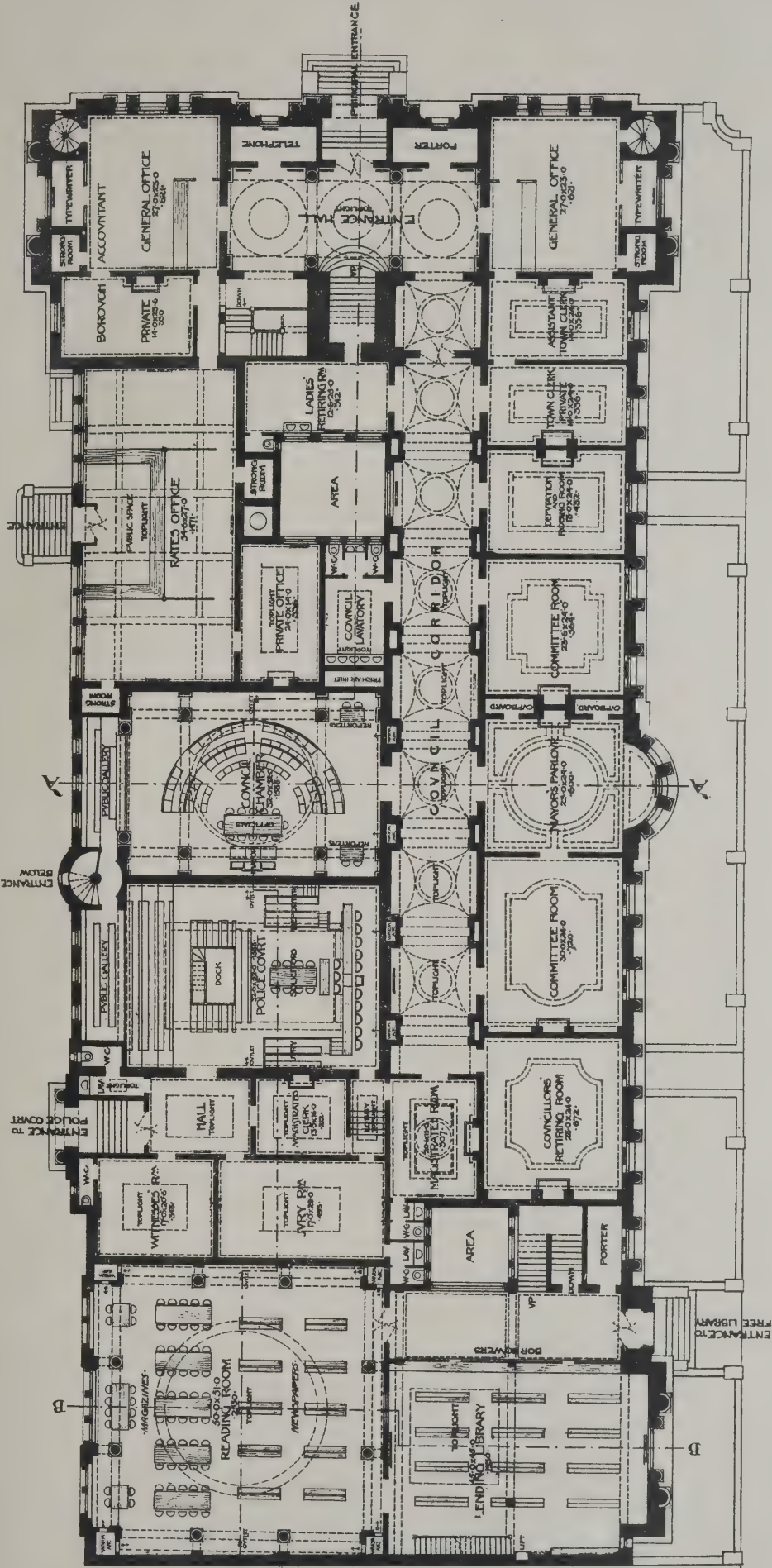


# BOROUGH & HARROGATE: PROPOSED TOWN HALL:

GROUND PLAN:

Scale 1/4" = 10' 0"

RAGLAN STREET



VICTORIA AVENUE

FIRST PREMIATED DESIGN.

By H. T. HARE, F.R.I.B.A.

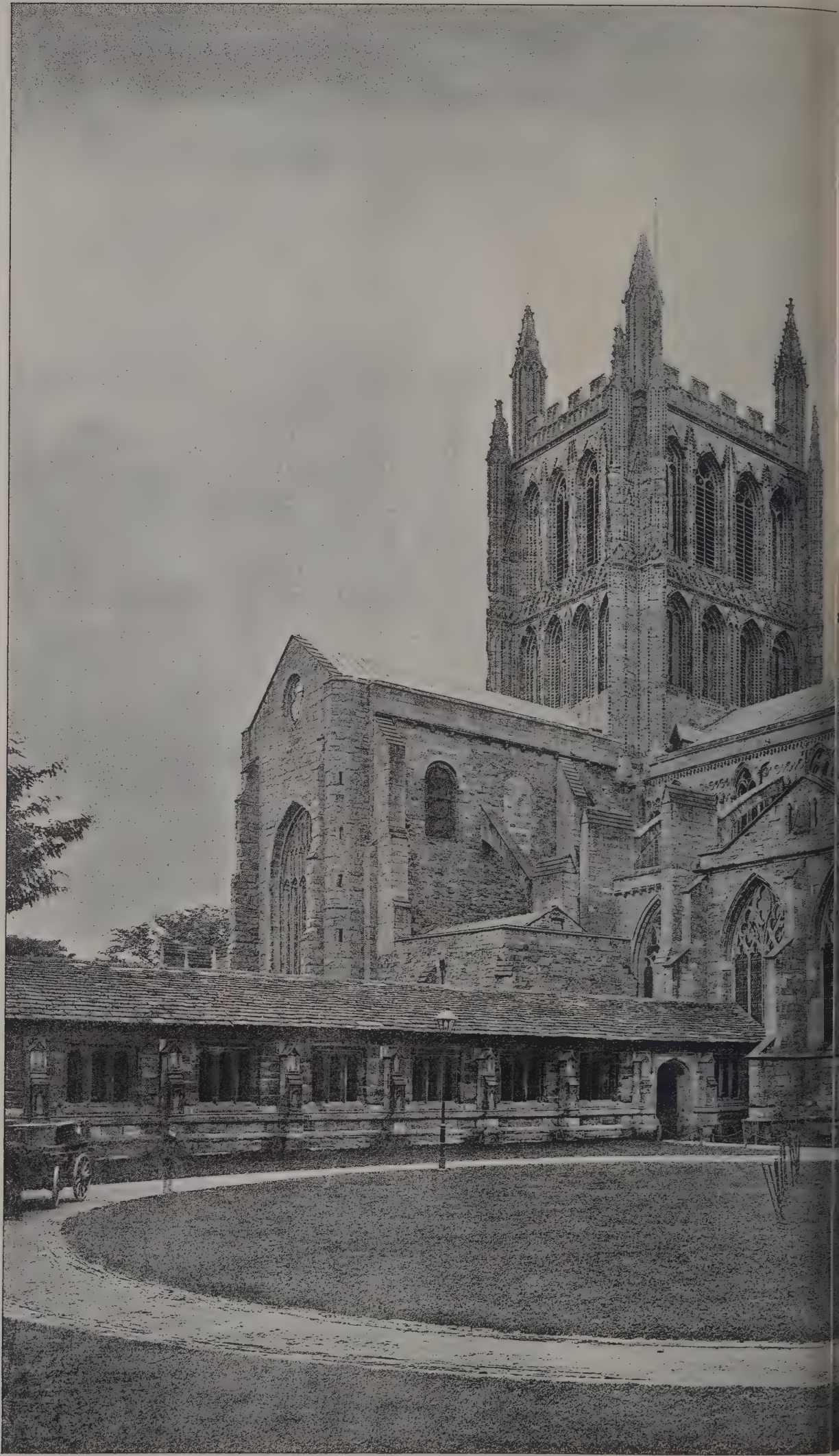






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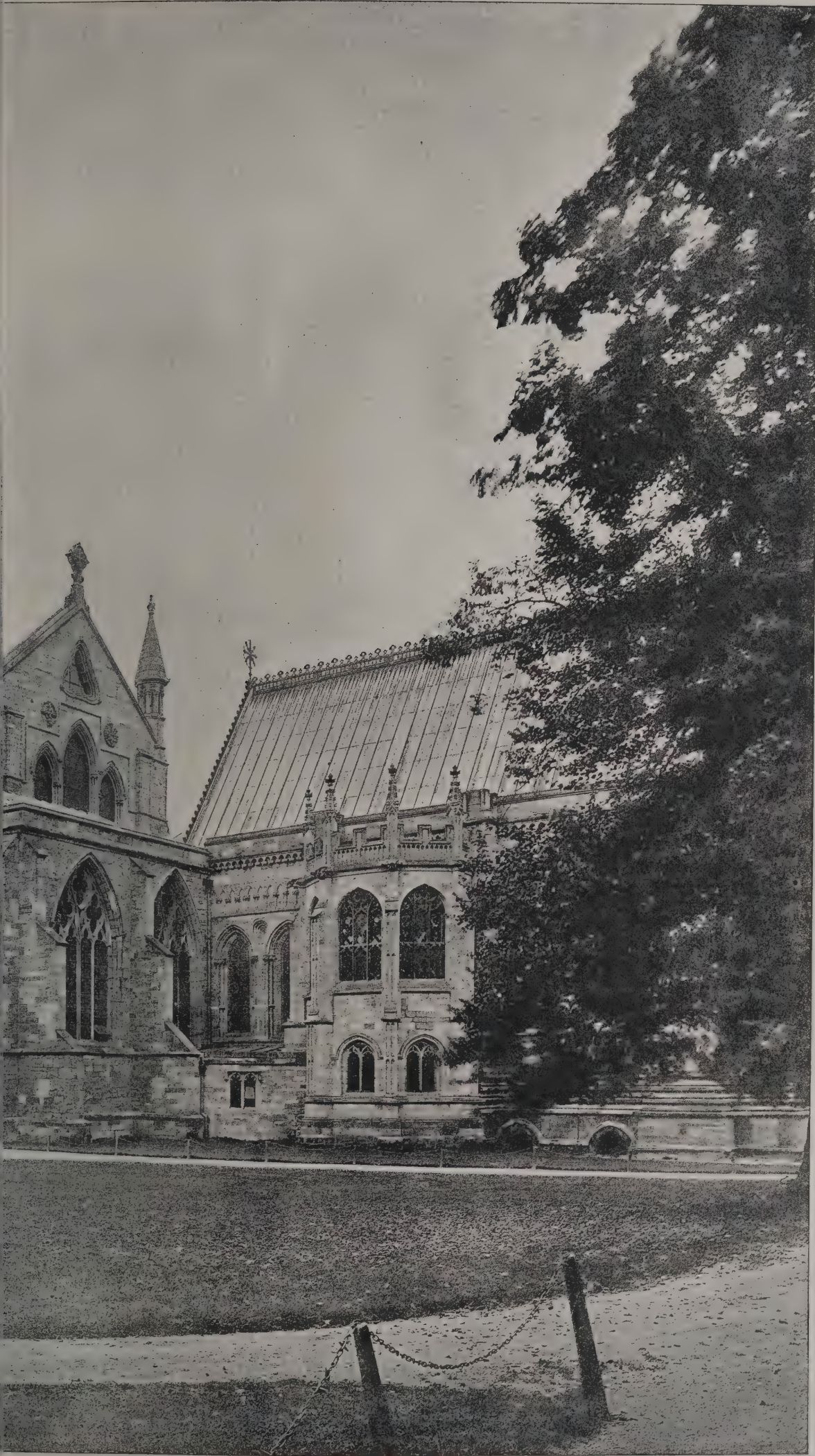




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INK PHOTO, SPRAGUE & CO. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

D: VIEW FROM SOUTH-EAST.







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"RHINEFIELD," HANTS  
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THE  
Architect and Contract Reporter.

## EDITORIAL NOTICES.

*In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

## TENDERS, ETC.

*\*\* As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

## COMPETITIONS OPEN.

**AYLESBURY.**—July 19.—Designs and estimates are invited for supplying and erecting a stone monument, 50 feet high, on Coombe Hill, near Aylesbury. Mr. R. J. Thomas, county surveyor, County Hall, Aylesbury.

**BERMONDSEY.**—Sept. 16.—Designs are invited for artisans dwellings to be erected on land at Rotherhithe, within the borough of Bermondsey, and known as the Fulford Street area. Premiums of 100*l.*, 60*l.* and 40*l.* will be awarded. Mr. Fredk. Ryall, town clerk, Town Hall, Spa Road, S.E.

**BIDEFORD.**—Sept. 25.—The Town Council of Bideford are about to erect municipal offices and a public library upon a site opposite the west end of the Long Bridge, Bideford, and they invite designs for the proposed buildings. Premiums of 30*l.*, 15*l.* and 10*l.* respectively are offered for the designs which shall be placed by the Council first, second and third in order of merit. Designs and descriptions, &c., are to be delivered to Mr. Wm. B. Seldon, town clerk, 18 The Quay, Bideford.

**CLACTON-ON-SEA.**—July 26.—Plans are invited for erection of a new school in Holland Road, Great Clacton, for 500 children, showing enlargement for an extra 300 children. Mr. Charles E. White, clerk, Wellesley Road, Clacton-on-Sea.

**DEPTFORD.**—Aug. 30.—Competitive designs are invited for a town hall and municipal offices. Premiums of 100*l.*, 75*l.* and 50*l.* are offered for the three selected designs. Mr. Vivian Orchard, town clerk, Municipal Offices, 20 Tanner's Hill, Deptford S.E.

**INDIA.**—Nov. 1.—Competitive designs are invited for the erection of a memorial to Her Majesty the late Queen Victoria at Allahabad. A premium of 2,000 rupees will be awarded to the design selected by the committee. Mr. H. Nelson Wright, Indian Civil Service, honorary secretary, Queen Victoria Memorial Fund Committee, Allahabad, India.

**LIVERPOOL.**—Sept. 15.—Designs are invited for new labourers' dwellings to accommodate about 2,500 persons, to be erected on the Hornby Street area. Premiums of 250*l.*, 150*l.* and 100*l.* respectively are offered for the first three selected designs. Particulars will be supplied by the Town Clerk.

**SOUTHEND.**—Sept. 7.—Designs are invited for a church to accommodate 500 persons, a clergy-house, and a parochial hall or parish-room about 50 feet by 30 feet. Mr. C. H. J. Talmage, Kathleen Villa, Southchurch Road, Southend-on-Sea.

**SUNDERLAND.**—Aug. 30.—Designs are invited for proposed police and fire-brigade buildings to be erected in Gill Bridge Avenue and Dun Cow Street. Premiums of 100*l.*, 50*l.* and 25*l.* are offered for first, second and third designs respectively. Mr. Fras. M. Bowey, town clerk, Town Hall, Sunderland.

**TOTTENHAM.**—July 15.—Designs are invited for municipal buildings, fire station, public baths, &c. Premiums of 200*l.*, 100*l.* and 50*l.* are offered for the three best designs in order of merit. Mr. W. H. Prescott, surveyor to the Council, Tottenham.

## CONTRACTS OPEN.

**ALDERSHOT.**—July 23.—For erection of stables, cartsheds and other buildings in connection with the new depôt. Mr. Nelson F. Dennis, surveyor, Aldershot.

**ALLERDEAN.**—July 15.—For erection of the proposed new P.M. church at Allerdean. Mr. J. Mowitt, Shoreswood, Norham-on-Tweed.

**ASHTON-IN-MAKERFIELD.**—July 15.—For erection of a country police station at Ashton-in-Makerfield. Mr. Henry Littler, architect, County Offices, Preston.

**BALHAM.**—July 15.—For alterations and additions to the tramways depôt. Architect's Department (General Section), L.C.C., 19 Charing Cross Road, W.C.

**BATLEY.**—July 14.—For alterations to tailoring department and erection of new workrooms in Commercial Street, Batley, Yorks. Mr. Harry B. Buckley, architect, 85 Commercial Street, Batley.

**BISHOP AUCKLAND.**—July 14.—For several works required in renovating and decorating the Primitive Methodist chapel, Toft Hill. Rev. W. D. Cox, Toft Hill.

**BOSTON.**—July 14.—For erection of municipal buildings. Mr. Jas. Rowell, architect, Borough Offices, Market Place, Boston.

**BRADFORD.**—July 14.—For erection of buildings on a site in Drummond Road, Manningham, Bradford. Messrs. Empsall & Clarkson, architects, 7 Exchange, Bradford.

**BRADFORD.**—July 15.—For several works (except mason) required in erection of nine terrace houses in Rushton Road, Thornbury. Messrs. Fairbank & Wall, architects, Craven Bank Chambers, Bradford.

**BRIGHTON.**—July 15.—For internal and external repairs, painting, &c., to certain of the Board schools during the month of August. Messrs. T. Simpson & Son, surveyors, 17 Ship Street, Brighton.



Fig. 1.

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BRISTOL.—July 14.—For additions to the cattle lairs at Avonmouth Docks, including drains, brick-paved floors, timber superstructure, with tiled roof, &c. The Secretary of the Docks Committee, 19 Queen Square, Bristol.

BRISTOL.—July 28.—For extensions to the Ham Green hospital, Pill, Bristol, comprising two pavilions, discharging block, additions to administration building, &c. Mr. T. H. Yabicom, city engineer, 63 Queen Square, Bristol.

BURY.—For rebuilding the Robin Hood inn, Rochdale Road, Bury, Lancs. Mr. A. Hopkinson, architect, 15 Agur Street, Bury.

BURY.—July 24.—For alterations and additions to the manager's house at the sewage-disposal works at Blackford Bridge. Mr. Arthur W. Bradley, borough surveyor, Bury, Lancs.

CANNOCK.—July 22.—For erection of an infants' school for 210 children, with caretaker's house, out-offices and boundary walling in Station Road, Hednesford, Staffs. Messrs. Bailey & McConnal, architects, Bridge Street, Walsall.

CANTERBURY.—July 14.—For works required at the boys' dormitory of the workhouse. Mr. G. Smith, architect, 34 Station Road, Canterbury.

CANTERBURY.—July 18.—For repairs, painting, &c., at the County Lunatic Asylum, Chartham Downs, near Canterbury. Mr. W. J. Jennings, architect, 4 St. Margaret's Street, Canterbury.

CARLISLE.—Aug. 1.—For erection of grand stands, &c., for the Carlisle Race Stand Company, Ltd. Mr. Joseph Graham, architect, Bank Street, Carlisle.

CASTLEFORD.—July 14.—For erection of two houses in Charles Street, Castleford. Mr. Arthur Hartley, architect, County Chambers, Castleford.

CHESTERFIELD.—Aug. 9.—For construction of a new main outfall sewer at Cresswell, for the Clown Rural District Council. The works will comprise about  $1\frac{1}{4}$  miles of 12-inch stoneware pipe sewers, together with all manholes, ventilators, flushing arrangements and other appurtenances. Mr. James Snow Whall, clerk, 44 Bridge Street, Worksop.

CHESTERFIELD.—Aug. 11.—For erection of infirmary, nurses' home, laundry and other works at the workhouse, Newbold Road, Chesterfield. Messrs. Rollinson & Son, architects, 13 Corporation Street, Chesterfield.

COCKINGTON.—July 15.—For completion of St. Matthew's Church, Cockington. Messrs. Nicholson & Corlette, architects, 2 New Square, Lincoln's Inn.

COVENTRY.—July 21.—For conversion of the old mill at the workhouse into dayrooms and dormitory. Mr. Thos. F. Tickner, architect, 7 Bishop Street, Coventry.

COVENTRY.—July 21.—For repairs and alterations to premises, Gosford Street, Coventry. Mr. Herbert W. Chattaway, architect, Trinity Churchyard, Coventry.

DURHAM.—July 18.—For (1) widening South Church Bridge, near Bishop Auckland, (2) widening Langdon Beck bridge in Teesdale, (3) rebuilding Snodberry bridge in Wear-dale, and (4) building a new police station at Felling-on-Tyne. Mr. William Crozier, county surveyor, Shire Hall, Durham.

EGREMONT.—July 17.—For alterations and additions to 1 Market Place, Egremont, Cumberland. Mr. J. S. Stout, 36 Lowther Street, Whitehaven.

ELLAND.—July 25.—For erection of a refuse destructor and electric light and power station. Mr. James Clarkson, clerk, Council Offices, Elland.

FALMOUTH.—July 17.—For erection of a classroom at Wellington Terrace school. Mr. W. Jenkins, clerk to School Board, 39 Church Street, Falmouth.

FINCHLEY.—July 21.—For erection of an electricity generating station. Mr. Edward Calvert, chief electrical engineer, 2 Broadway, Finchley.

GLASS HOUGHTON.—For renovation of Glass Houghton, Yorks, Primitive Methodist chapel. The Rev. J. Burkitt, Castleford, will supply particulars.

GREENWICH.—July 16.—For decorative repairs and proposed new organ chamber, &c., at Christ Church, East Greenwich. Mr. Alfred Roberts, architect, 18 Nelson Street, Greenwich.

HAMPSTEAD.—July 17.—For erection of boundary wall, &c., at the new stoneyard and dépôt, Lymington Road, Finchley Road, N.W. Mr. Arthur P. Johnson, town clerk, Town Hall, Haverstock Hill, Hampstead, N.W.

HASTINGS.—July 15.—For erection of a technical school on the Tower Road school site. Mr. A. W. Jeffery, architect, 5 Havelock Road, Hastings.

HEMINGFORD GREY.—July 14.—For erection of a central school and master's house, &c., at Hemingway Grey, Hunts. Mr. George G. G. Wheeler, clerk, School Board, St. Ives, Hunts.

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HEYWOOD.—July 14.—For erection of (1) destructor works, comprising boiler-house, engine-house, offices and stores; (2) chimney shaft, 100 feet high, at Botany. Mr. Geo. G. Bouchier, town clerk, Heywood.

HUDDERSFIELD.—July 16.—For erection of a dwelling-house and stable in Barton Road, Crosland Moor. Mr. J. Berry, architect, 3 Market Place, Huddersfield.

HULL.—July 14.—For erection of a municipal school of art in Anlaby Road, Hull. Messrs. Lancheater, Stewart & Rickards, architects, 1 Vernon Place, Bloomsbury Square, W.C.

IRELAND.—For erection of stores at Newport, near Hillsborough, co. Down. Mr. Henry Hobart, architect, Dromore, co. Down.

IRELAND.—July 15.—For erection of 92 labourers' cottages and acre fences, 169 half-acre fences, and for repair of 17 houses, Rathkeale. Mr. T. B. Naughton, clerk, Board Room, Rathkeale.

IRELAND.—July 18.—For erection of a public abattoir in Stewart Street, Belfast. Sir Samuel Black, town clerk, Belfast.

IRELAND.—July 23.—For construction of a storage reservoir at Barnattin, near Drogheda, with a capacity of about 60,000,000 gallons, for the Drogheda Corporation. Mr. L. Donegan, secretary, Gas and Water Offices, Drogheda.

IRELAND.—July 24.—For erection of a central creamery building of stone or iron at Lear, Bailieborough. Mr. T. M. Farrelly, Bailieborough.

KINGSTON-UPON-THAMES.—July 21.—For erection of a new free library in Fairfield Road. Mr. J. Alfred Cox, architect, 4 Adam Street, Adelphi, W.C.

LEEDS.—For erection of large shed (wood and corrugated iron) in Gelderd Road, Holbeck, Leeds. Mr. G. Fredk. Bowman, architect, 5 Greek Street, Leeds.

LEEDS.—July 15.—For erection of premises for the Halton parish institute, at the junction of High Street and Chapel Street, Halton. Messrs. Bedford & Kitson, architects, Greek Street Chambers, Leeds.

LEEDS.—July 16.—For erection of dispensary premises in North Street, Hartley Hill and Back Brunswick Street, Leeds. Messrs. Bedford & Kitson, architects, Greek Street Chambers, Leeds.

LEEDS.—July 17.—For supply of earthenware pipes, junctions, gullies, &c., for twelve months from August 1. City Engineer's Office, Leeds.

LEEDS.—July 17.—For supply of lime to Knostrop Sewage Works, for twelve months from August 1. City Engineer's Office, Leeds.

LEEDS.—July 17.—For extension of tramcar painting sheds. City Engineer's Office, Leeds.

LEEDS.—July 21.—For erection of underground conveniences at Kirkgate Market, Leeds. One guinea deposit with application. City Engineer's Office, Leeds.

LEICESTER.—July 21.—For erection of an infirmary at North Evington, Leicester. Messrs. Giles, Gough & Trollope, architects, 28 Craven Street, Charing Cross, S.W.

LEWES.—July 23.—For erection of board-room and offices in West Street, Lewes. Mr. Henry Card, architect, 10 North Street, Lewes.

LONDON.—For erection of business premises near London. Mr. Joseph Bernays, 96 Newgate Street, E.C.

LONDON.—For four houses of joinery at Hampstead. Mr. James Tomblin, Killarney, East Drive, Hampstead, N.W.

LONDON.—July 22.—For foundations for the proposed new Land Registry offices, Lincoln's Inn Fields, for the Commissioners of H.M. Works and Public Buildings. Particulars may be obtained on application to Mr. Henry Tanner at H.M. Office of Works, Storey's Gate, S.W.

LUTON.—July 21.—For erection of two galleries in the Chapel Street Infant school; alteration and extension of latrines in the Chapel Street boys' yard; painting and other renovation, both external and internal; painting (external), the pointing of brickwork and other renovations at the Biscot school. Messrs. J. R. Brown & Son, architects, Castle Street, Luton.

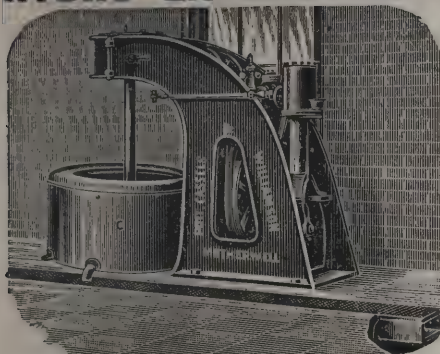
MANCHESTER.—July 19.—For construction of underground lavatories for males and females at Stevenson Square. Applications for particulars to be made to the City Surveyor, Town Hall, Manchester.

MANCHESTER.—July 19.—For wall tiling required at the underground lavatory, Victoria Street. Specifications and bills of quantities may be obtained at the office of the City Surveyor, Town Hall, Manchester.

MANCHESTER.—July 22.—For widening of L. and Y. Railway line at Brighthouse. Contract No. 3. Particulars at Engineer's Office, Hunt's Bank, Manchester.

MEXBOROUGH.—July 15.—For additions and alterations to the working-men's club and institute, Main Street, Mex-

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borough, Yorks. Mr. Wilfred Gothwaite, architect, 78 High Street, Mexborough.

MIDDLESBROUGH.—July 14.—For erection of three brick annexes to the hospital wards and works in connection with the main drainage, &c., including manholes, &c. Mr. Frank Baker, borough engineer, Municipal Buildings, Middlesbrough.

NEWARK.—July 22.—For erection of an infant school accommodating 300 children on a site adjoining the Great North Road, Balderton. Messrs. Saunders & Saunders, architects, Arcade Chambers, Newark-on-Trent.

PENSHURST.—July 18.—For erection of eight workmen's cottages in Penshurst, Kent. Mr. Fred. Tayler, architect, 26 Temple Street, Aylesbury.

PLYMOUTH.—July 16.—For erection of a dry wall at Knighton and laying pipes at Wembury Ford. Mr. Fred. Wm. Cleverton, 4 Buckland Terrace, Plymouth.

SCOTLAND.—July 14.—For alterations on tenements, 5 Church Place and 17 Saunders Street, Edinburgh. Mr. Thomas Hunter, town clerk, City Chambers, Edinburgh.

SCOTLAND.—July 14.—For extension of the bazaar, Glasgow. Sir J. D. Marwick, town clerk, City Chambers, Glasgow.

SCOTLAND.—July 14.—For erection of a farm steading, Mains of Idoch. Messrs. James Duncan & Son, architects, Turriff.

SCOTLAND.—July 15.—For erection of refuse-destroyer buildings in Anderson Street, Port Glasgow. Messrs. Stewart Tough & Alexander, architects, 2 Hamilton Street, Greenock.

SCOTLAND.—July 16.—For erection of the Larbert public library. Messrs. A. & W. Black, architects, Falkirk.

SCOTLAND.—July 31.—For extension of Glasgow Central Station hotel for the Caledonian Railway Company. Mr. James Miller, architect, 15 Blythswood Square, Glasgow.

SHERBORNE.—July 18.—For cleaning and repairing the interiors of the following police stations, viz.:—Beaminster, Blandford, Bridport, Cerne, Cranborne, Dorchester, Gillingham, Lyme Regis, Shaftesbury, Sherborne, Sturminster, Wareham, Wimborne, Dorset. Mr. E. A. Fooks, clerk to the Standing Joint Committee, Sherborne.

SHILLINGSTONE.—July 15.—For reconstructing the Hayward bridge, Shillingstone, Dorset. Plans and specifications and particulars may be obtained at County Surveyor's Office, Wimborne.

SPRINGWELL COLLIERY.—July 15.—For building a reading-room at Springwell Colliery, near Gateshead. Mr. E. Cleugh, Springwell Colliery.

STOCKTON.—July 14.—For erection of a new bridge over the boundary beck between Cowpen Bewley and Newton Bewley, for the Stockton Rural District Council. Mr. T. H. Faber, clerk, Stockton-on-Tees.

THORNTON.—July 16.—For erection of twenty-nine houses, &c., at Thornton, Yorks. Mr. Medley Hall, architect, 29 Northgate, Halifax.

TOOTING.—July 14.—For repainting, redecorating and executing general repairs to the Blackshaw Road chapel and lodges at the Lambeth cemetery. Mr. Henry Edwards, C.E., borough engineer, Lambeth Town Hall, Kennington Green.

TOTTINGTOWN.—For erection of house and surgery at Tooting, Lancs. Messrs. Thos. Nuttall & Son, architects, 20 Market Street, Bury.

WALES.—July 14.—For erection of a higher elementary school at Porth. Mr. Jacob Rees, architect, Hillside Cottage, Pentre.

WALES.—July 17.—For additions to offices in Charles Street, Cardiff. Messrs. Veall & Sant, architects, Cardiff.

WALES.—July 17.—For erection of ten houses at Port Talbot. Mr. F. B. Smith, C.E., architect, Port Talbot.

WALES.—July 18.—For erection of a chapel at Mountain Ash. Mr. G. A. Treharne, architect, Aberdare.

WALES.—July 18.—For erection of schools at Bala. Mr. R. Ll. Jones, architect, Station Road, Bala.

WALES.—July 21.—For alterations and additions to the Prince Albert inn, Albert Street, Aberdare. Messrs. J. Llewellyn Smith & Davies, architects, Aberdare.

WALES.—July 21.—For erection of stables and stores at Abertillery and Llanhilleth. Mr. James McBean, surveyor, 1 King Street, Abertillery.

WALES.—July 21.—For erection of twelve cottages at Brithdir. Mr. E. A. Johnson, architect, Merthyr.

WALES.—July 21.—For renovation of the Bethel church, Upper Cwmbran. Mr. T. Williams, secretary.

WALES.—July 24.—For erection of a boiler and engine house at the Joint Counties asylum, Carmarthen. Particulars on application to the Clerk to the Asylum.

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Architect" will be forwarded on application to Gilbey  
Wood & Co., Ltd., Imperial Buildings, Ludgate Circus.



**WALES.**—July 24.—For alteration of Penrhiwceiber girls' school cloakroom, erection of boundary walls, and general repairs. Mr. S. Shipton, clerk, Town Hall, Mountain Ash.

**WHITBY.**—July 18.—For erecting new farm buildings at the Plum Tree Farm, Glaisdale, Egton Estate. Mr. Edward H. Smales, architect, 5 Flowergate, Whitby.

**WORKINGTON.**—July 22.—For erection and completion of eighteen dwelling-houses in Blackburn Street. Mr. John Warick, town clerk, Town Hall, Workington.

**YARM-ON-TEES.**—July 16.—For erection of a cemetery chapel at Yarm-on-Tees. Mr. T. W. T. Richardson, architect, 57 High Street, Stockton-on-Tees.

**YORK.**—July 16.—For erection of the proposed general offices at York, for the North-Eastern Railway Company. Mr. William Bell, company's architect, York.

## TENDERS.

### ALNWICK.

For proposed new 4-inch by 7-inch whinstone sett paving and cement concrete at Paikes Street, and for three public street crossings. Mr. G. WILSON, town surveyor.  
MCLAREN & Co. (accepted per schedule).

### ASHBY-DE-LA-ZOUCH.

For sewerage works. Mr. J. B. EVERARD, engineer, 6 Millstone Lane, Leicester.

C. Chamberlain	£1,681	3	8
Bentley & Loch	1,643	5	9
Johnson & Langley	1,623	3	2
Slater & Sons	1,409	16	3
T. Philbrick	1,374	8	6
J. R. Holmes	1,346	0	0
E. Orton	1,245	6	10
R. W. Barker	1,225	6	0

### ASTON.

For erection of schools in Slade Road, Erdington, Aston.  
T. JOHNSON (accepted) £9,190 0 0

### BARNARD CASTLE.

For supply of timber required for the showyard erections for the annual show of the Durham County Agricultural Society, to be held at Barnard Castle on August 8.

J. Livingston	£281	0	0
HARRISON & SINGLETON, West Hartlepool			
(accepted)			
J. Scott & Son	242	5	6
	241	17	3

### BASFORD.

For alterations and additions to the workhouse. Mr. W. V. BETTS, architect, Bank Offices, Old Basford.

T. Cuthbert	£1,300	0	0
W. Savage	1,250	0	0
G. Hopewell & Son	1,250	0	0
W. J. Hutchinson	1,214	10	0
H. INGHAM, Old Basford, Nottingham (accepted)	1,209	14	0

### BOWLING.

For construction of a reservoir (900,000 gallons) and pipe line (740 yards) at Bowling. Messrs. THOMAS BARKER & SON, engineers, 5 Bank Street, Bradford.  
P. DRAKE, Bradford (accepted).

### BRIGHTON.

For erection of new pavilions and a mortuary at the Borough Sanatorium, Bear Road, Brighton. Mr. F. J. C. MAY, borough surveyor.

J. LONGLEY & Co., Crawley (accepted) £24,869 0 0

### CATFORD.

For erection of a Baptist church in Brownhill Road. Messrs. SMEE, MENCE & HOUGHIN, architects, 12 West Smithfield, E.C. Quantities by Mr. A. GOODCHILD, 87 Finsbury Pavement, E.C.

Holliday & Greenwood	£6,877	0	0
Kiddle & Son	6,700	0	0
Higgs & Hill, Limited	6,680	0	0
Castle & Son	6,489	0	0
Campbell, Smith & Co.	6,400	0	0
Smith & Sons	6,390	0	0
Battley, Sons & Holness	6,147	0	0
J. Greenwood	6,137	0	0
JERRARD & SONS (accepted)	5,879	0	0

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## BISHOP AUCKLAND.

For painting railings, gates, seats, &amp;c., at the cemetery.

R. Thompson	£15	0	0
E. HAY, 3 South View ( <i>accepted</i> )	11	5	0

## CASTLEFORD.

For whitewashing, colour-washing and cleaning the inside of Whitwood Mere Board schools.

J. W. WHEATLEY, Brotherton ( <i>accepted</i> )	£19	15	0
W. Watson	18	5	0
W. Best.	15	10	0

## CONGLETON.

For laying about three miles of 3-inch and 4-inch water-mains in the township of Church Lawton. Mr. C. R. HALL, engineer, 1 West Street, Congleton.

W. Lawton	£1,475	0	0
J. Stringer	1,198	0	0
T. Rowland	1,188	8	0
A. Lee	1,180	0	0
J. Dale	1,099	16	4
F. BURKE, Stoke ( <i>accepted</i> )	1,093	0	0

## CORNWALL.

For laying waterpipes in the village of Kingsand, in the parish of Maker, St. Germans, Cornwall.

W. E. BENNETT, Plymouth ( <i>accepted</i> )	£214	0	0
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## DEPTFORD.

For providing and fixing iron gates at the entrance to the yard at Knott Street.

Mitchell & Co.	£87	10	0
Bayliss, Jones & Bayliss	76	5	0
Knights & Chapman, Ltd.	68	16	0
Bayliss, Jones & Bayliss	66	17	6
F. Morton & Co., Ltd.	66	0	0
Hall Bros.	62	0	0
A. E. Wood	59	12	0
Rowlingson & Co.	45	7	6
W. Hayward & Sons, Ltd.	44	10	0
W. A. Baker & Co., Ltd.	38	13	6
USHER & SKINNER, 23 Childers Street ( <i>accepted</i> )	36	10	0
Bostwick Gate Co.	35	15	0

## DUDLEY.

For erection of two cemetery chapels and entrance lodge at the new cemetery, Stourbridge Road. Mr. JOHN GAMMAGE, architect. Quantities by Mr. F. W. OLDFIELD, Sutton Coldfield.

*Accepted tenders.**Two cemetery chapels.*

Mark Round, Dudley	£3,997	0	0
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*Entrance lodge.*

Mark Round, Dudley	940	0	0
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## ELLAND.

For erection of two semi-detached villa residences, outbuildings, &amp;c., in Hullen Edge Road, Elland, Yorks. Mr. F. F. BEAUMONT, architect, Southgate Chambers, Halifax.

*Accepted tenders.*

W. H. & B. Priestley, Stainland, mason.  
J. Walker, Thornhill Street, Lindley, joiner.  
S. Collins & Sons, Stainland, slater and plasterer.  
J. W. Sykes, Dean Street, Westvale, plumber.

## GRAVESEND.

For small structural alteration at the hospital.

Beal & Hubbard	£48	10	0
J. M. DERING, Princes Street, Gravesend ( <i>accepted</i> )	30	7	0

## HERNE.

For cleansing, repainting and general repairs of the isolation hospital wards and offices at West End, Herne, Kent, and for laying about 580 feet of 4-inch and 160 feet of 6-inch stoneware pipes, the building of inspection-chambers, fixing of gullies, ventilation shafts and the building of cesspools for the drainage of the said hospital. Tenders opened July 8. Mr. W. D. STATHAM, surveyor, Eddington, near Canterbury.

Keeler, Nos. 1 and 2	£375	0	0
C. W. Welby, Nos. 1 and 2	286	0	0
Dennis, No. 1	268	0	0
F. W. Smellie, Nos. 1 and 2	240	0	0
F. W. Gates, Nos. 1 and 2	203	0	0
Wiver & Co., No. 1	164	0	0
T. Collard, No. 2	108	0	0
CHURCH & Co., Whitstable, No. 1 ( <i>accepted</i> )	95	0	0
P. FURLEY, Herne Bay, No. 2 ( <i>accepted</i> )	79	0	0

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HAMMERSMITH.

For erection of a workhouse at Wormwood Scrubs.			
S. W. Moscrip	£225,270	0	c
Wimpey & Co.	218,326	0	0
R. L. Tonge	216,000	0	0
W. Wisdom	215,000	0	0
C. Wall	214,274	0	0
J. E. Johnson & Co.	212,000	0	0
S. Santo	209,763	0	0
J. Smith & Sons, Ltd.	208,827	0	0
J. Dorey	208,504	0	0
J. Appleby	208,150	0	0
C. Dearing & Son	208,150	0	0
D. E. Wallis & Sons	207,480	0	0
J. C. Leshar & Sons	207,109	0	0
A. E. Kenneth & Sons, Ltd.	205,825	0	0
J. T. Hockley	205,500	0	0
Pattinson & Sons	205,218	0	0
Killby & Gayford	204,962	0	0
McCormick & Son	203,934	0	0
C. F. Kearney	203,403	0	0
C. Lawrence & Sons	203,333	0	0
C. Gray Hill	203,330	0	0
F. D. Winter	199,875	0	0
Holliday & Greenwood, Ltd.	199,544	0	0
B. E. Nightingale	199,268	0	0
Clarke & Randall	197,744	0	0
J. Shillitoe & Son	195,000	0	0
H. Wilcox & Co.	193,500	0	0
W. Hopkins	193,450	0	0
W. Williams	192,420	0	0
T. ROWBOTHAM, Coventry Road, Birmingham (accepted)	187,777	0	0

HENSALL.

For erection of Wesleyan church and Sunday schools, Hensall, near Snaith, Yorks. Messrs. GARSIDE & PENNINGTON, architects, Pontefract and Castleford.			
J. FAIRBAIRN, Hensall (accepted)	£704	0	0

IRELAND.

For supplying wire fencing with iron standards, and wrought-iron gates with cast-iron pillars, to the Donegal District lunatic asylum, Letterkenny.			
KENNAN & SONS, LTD., Dublin (accepted)	£292	12	6

IRELAND—continued.

For supply of 134 iron grates for the Fermoy workhouse.			
T. Cosgrove, Fermoy, 17s.			
J. Murray & Sons, Fermoy, 16s. 6d.			
T. O'Keefe, Glanworth, co. Cork, 16s. each (accepted).			
For supply of a surfacing and sliding lathe slotting machine and an 8-h p. (nominal) gas-engine, for the Belfast Harbour Commissioners.			
<i>Accepted tenders.</i>			
Louden Bros., Glasgow, lathe.			
F. Pratt & Co., Ltd., Halifax, slotting machine.			
R. Carswell & Son, Belfast, gas-engine.			

LEEDS.

For erection of two houses and two shops, Dewsbury Road, Messrs. BUTTERY & BIRD, architects, Albion Walk, Leeds.			
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*Accepted tenders.*

J. H. Appleby, mason	£620	0	0
H. Hepworth, joiner	256	0	0
Knight & Hickman, plumber	104	16	0
H. Pearson, plasterer	61	10	c
J. Atkinson & Son, slater	40	0	0
H. Lee, painter	25	0	0
For painting the fountain, shelter, greenhouses, lavatories, lamp arches, fencing, &c., at Hunslet Moor.			
J. PRIEST, Hunslet (accepted)	£79	15	0
For laying about 1,200 square yards of tar macadam at Rodley, Stanningley and Wortley Parks.			
NORTH OF ENGLAND ASPHALTE CO., Manchester (accepted)			
	£215	5	10

For erection of baths and library fronting to York Road and All Saints Place Mr. H. ASCOUGH CHAPMAN, architect, Prudential Buildings, Park Row, Leeds.			
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*Accepted tenders.*

P. Rhodes, excavator and mason	£10,397	9	9
B. Mawson, joiner	3,295	0	0
G. Thompson, plumber	1,350	0	0
Perkins & Co., Ltd., ironfounders	997	15	0
T. Moore, plasterer	463	0	0
Pickles Bros, slater	326	0	0
Roylance & Horsman, painter	248	10	0

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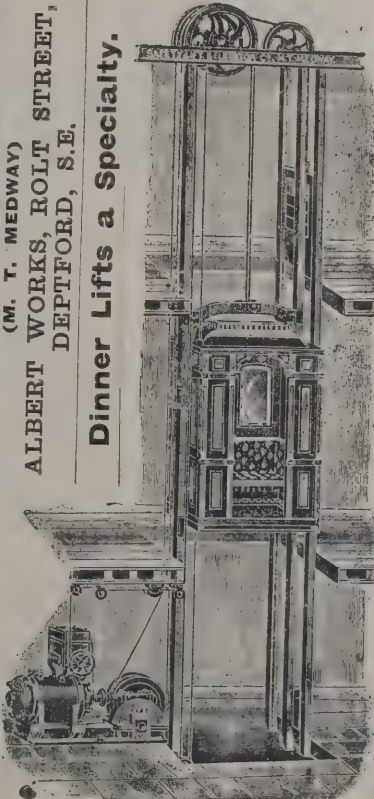
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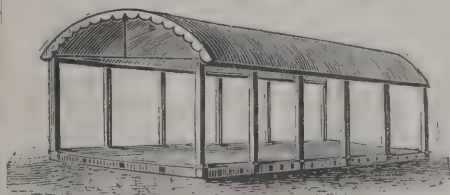


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Werner, Pfeiderer & Perkins, Ltd.	£96	10	0
R. Clarke	89	0	0
J. Esson	88	10	0
Comyn Ching & Co.	69	18	0
G. & E. Bradley *	67	0	0

\* Recommended for acceptance.

The work at the following schools will be done during the time of summer holidays—July 25 to August 23. Where exterior as well as interior work has to be done an additional week will be allowed for the former:—

For painting interior, Halford Road.

W. Chappell	£420	0	0
C. Curd & Son	369	0	0
Rice & Son	359	0	0
C. Gurling	354	10	0
W. Hammond	344	0	0
W. Brown & Sons	327	0	0
F. CHIDLEY (accepted)	254	0	0

For painting interior and exterior, Kingwood Road.

W. Read	£586	10	0
Rice & Son	579	0	0
J. R. Sims	570	0	0
E. Triggs	570	0	0
Lathey Bros.	540	0	0
W. Hornett	524	10	0
Belcher & Co., Ltd.	453	9	0
W. HAMMOND (accepted)	449	0	0

For painting interior of old rooms only (main school), and for painting interior and exterior (special school), Portobello Road.

S. Polden	£412	0	0
W. Hornett	359	10	0
F. T. Chinchin & Co.	339	0	0
A. Balfour & Co.	289	5	6
W. Brown & Sons	268	0	0
W. R. & A. Hide	259	0	0
Bristow & Eatwell	257	15	0
G. H. SEALY (accepted)	215	0	0

## LONDON SCHOOL BOARD—continued.

For painting interior, Langford Road.

A. Balfour & Co.	£500	7	6
J. R. Sims	470	10	0
Rice & Son	460	0	0
E. Triggs	448	0	0
W. Hornett	444	0	0
Belcher & Co., Ltd.	411	8	0
C. Gurling	346	0	0
W. HAMMOND (accepted)	343	10	0

For painting interior and exterior, Ambler Road.

J. Stewart	£663	0	0
C. Dearing & Son	504	0	0
J. Grover & Son	486	0	0
McCormick & Sons	456	0	0
G. Kirby	440	0	0
T. Cruwys	439	10	0
Stevens Bros.	419	0	0
C. & W. HUNNINGS (accepted)	398	11	0

For cleaning interior and painting exterior, Central Street.

J. Haydon & Sons	£358	0	0
G. Wales	348	0	0
W. Hornett	337	0	0
Staines & Son	279	0	0
Stevens Bros.	279	0	0
G. Barker	254	0	0
BELCHER & CO., LTD. (accepted)	197	14	6

For painting interior and exterior, Brockley Road.

H. Leney & Son	£426	0	0
J. & C. Bowyer	352	0	0
W. Read	351	15	0
W. Banks	345	0	0
C. G. Jones	308	0	0
E. Proctor	299	10	0
G. KEMP (accepted)	295	0	0

For painting interior and exterior, Sigdon Road.

J. Chessum & Sons	£485	0	0
Barrett & Power	452	0	0
Marchant & Hirst	439	0	0
G. Wales	430	0	0
M. Pearson	419	0	0
W. Silk & Son	399	10	0
G. BARKER (accepted)	371	0	0

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LONDON SCHOOL BOARD—continued

For painting exterior, Halstow Road.		
W. J. Howie . . . . .	£145	10 0
H. Groves . . . . .	136	0 0
W. Banks . . . . .	134	15 6
W. Hayter & Son . . . . .	115	0 0
E. PROCTOR (accepted) . . . . .	114	0 0
For painting exterior, Haggerston Road.		
G. Wales . . . . .	£256	0 0
J. Grover & Son . . . . .	248	0 0
Marchant & Hirst . . . . .	246	0 0
Barrett & Power . . . . .	239	0 0
J. Chessum & Sons . . . . .	230	0 0
G. Barker . . . . .	226	0 0
Stevens Bros. . . . .	219	0 0
W. MARTIN (accepted) . . . . .	206	0 0
For painting interior, Raywood Street.		
General Builders, Ltd. . . . .	£669	0 0
E. P. Bulled & Co. . . . .	470	0 0
E. Triggs . . . . .	434	0 0
E. Flood . . . . .	420	0 0
Lathey Bros. . . . .	397	0 0
Rice & Son . . . . .	389	0 0
J. Garrett & Son . . . . .	369	0 0
C. GURLING (accepted) . . . . .	342	0 0
For painting interior and exterior, Wirtemberg Street.		
E. Flood . . . . .	£365	0 0
J. Appleby . . . . .	322	0 0
E. Triggs . . . . .	307	0 0
Holliday & Greenwood, Ltd. . . . .	264	0 0
J. Garrett & Son . . . . .	262	0 0
Rice & Son . . . . .	261	0 0
Maxwell Bros, Ltd. . . . .	244	18 0
E. B. TUCKER (accepted) . . . . .	227	13 6
For painting the interior and exterior of the Gordon House school.		
S. N. Soole & Son . . . . .	£525	0 0
Lathey Bros. . . . .	425	0 0
Speechley & Smith . . . . .	417	10 0
E. B. Tucker . . . . .	399	4 0
J. W. Brooking . . . . .	387	0 0
W. Hornett . . . . .	347	16 0
H. TINKLER (accepted) . . . . .	329	18 9

LONDON SCHOOL BOARD—continued.

For painting interior, Credon Road.		
J. Harries . . . . .	£629	0 0
Rice & Son . . . . .	489	0 0
E. Triggs . . . . .	475	0 0
H. Line . . . . .	462	0 0
W. Sayer & Son . . . . .	433	0 0
E. PROCTOR (accepted) . . . . .	374	0 0
For painting interior (old portion), Collingwood Street.		
Vigor & Co. . . . .	£285	0 0
J. F. Holliday . . . . .	275	0 0
D. Gibb & Co. . . . .	273	0 0
Corfield & Co. . . . .	271	0 0
G. Barker . . . . .	255	0 0
BARRETT & POWER (accepted) . . . . .	228	0 0
J. Haydon & Sons . . . . .	224	10 0
For painting exterior, Garratt Lane.		
J. & M. Patrick . . . . .	£237	0 0
Hudson Bros. . . . .	215	0 0
E. Flood . . . . .	203	0 0
R. S. Ronald . . . . .	176	9 0
W. H. Lorden & Son . . . . .	144	0 0
E. P. Bulled & Co. (accepted) . . . . .	125	0 0
For painting interior, St. Paul's Road.		
T. Willson . . . . .	£412	0 0
Vigor & Co. . . . .	352	0 0
Corfield & Co. . . . .	350	0 0
G. Barker . . . . .	345	0 0
D. Gibb & Co. . . . .	338	0 0
A. W. DERBY (accepted) . . . . .	295	0 0
For painting interior and exterior, Trinity Place.		
J. Stewart . . . . .	£380	0 0
J. Haydon & Sons . . . . .	321	10 0
Viney & Stone . . . . .	285	0 0
T. Cruwys . . . . .	274	0 0
Stevens Bros. . . . .	254	0 0
G. BARKER (accepted) . . . . .	225	0 0
For painting interior, Buckingham Gate.		
J. Watkins . . . . .	£328	0 0
J. R. Sims . . . . .	324	0 0
Lathey Bros. . . . .	239	10 0
W. Hornett . . . . .	228	0 0
M. Pearson . . . . .	210	0 0
W. CHAPPELL (accepted) . . . . .	195	0 0

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Double Ply...	1 : 16 : 6	1 : 0 : 0
Asbestos ...	2 : 16 : 6	1 : 10 : 0

Bales containing 500 square feet each; half-bales 250 square feet. Weights: Single-ply, 80 lbs.; Double-ply, 120 lbs.; Asbestos, 190 lbs. per bale.

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For painting exterior, Tooting Graveney.

J. & M. Patrick . . . . .	£217	0	0
J. Appleby . . . . .	197	0	0
R. S. Ronald . . . . .	195	2	0
Rice & Son . . . . .	181	0	0
Holliday & Greenwood, Ltd. . . . .	173	0	0
W. H. Lorden & Son . . . . .	166	0	0
W. JOHNSON & CO., LTD. (accepted) . . . . .	159	0	0

For painting interior, Upper North Street.

A. W. Derby . . . . .	£287	10	0
D. Gibb & Co. . . . .	261	0	0
VIGOR & CO. (accepted) . . . . .	258	10	0

For painting interior of school, Stanhope Street.

T. Cruwys . . . . .	£424	0	0
F. T. Chinchin & Co. . . . .	419	0	0
W. Hornett . . . . .	403	0	0
Marchant & Hirst . . . . .	398	0	0
Viney & Stone . . . . .	382	0	0
W. Chappell . . . . .	335	0	0
J. R. SIMS (accepted) . . . . .	305	18	0

For painting interior, Neckinger Road.

J. Appleby . . . . .	£469	0	0
W. Sayer & Son . . . . .	432	0	0
J. Harries . . . . .	425	0	0
J. Greenwood . . . . .	405	4	6
H. J. Williams . . . . .	330	0	0
H. LINE (accepted) . . . . .	308	0	0

For painting exterior, Orange Street.

H. Line . . . . .	£171	0	0
W. Sayer & Son . . . . .	157	0	0
Johnson & Co. . . . .	139	0	0
H. J. Williams . . . . .	106	0	0
J. HARRIES (accepted) . . . . .	104	0	0

For painting interior, Chicksand Street.

J. Dolman & Co. . . . .	£471	0	0
J. Haydon & Son . . . . .	424	0	0
Vigor & Co. . . . .	418	0	0
J. F. Holliday . . . . .	397	10	0
D. Gibb & Co. . . . .	381	0	0
G. BARKER (accepted) . . . . .	345	0	0

## MAIDENHEAD.

For repairs to Chapel arches, Maidenhead. Mr. J. MORRIS, county bridges surveyor, 156 Friar Street, Reading.

C. W. Cox & Sons . . . . .	£120	0	0
N. Chandler . . . . .	106	7	3
THORNE & BRISTOW, Reading (accepted) . . . . .	89	14	2

## MILTON.

For erection of a dwelling-house at Milton, Wilts.

H. ASH, Devizes (accepted) . . . . .	£1,538	0	0
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## RUSHDEN.

For road works in Harborough Road, Rushden, Northants.

Mr. W. B. MADIN, town surveyor.			
W. G. Willmott . . . . .	£225	0	0
W. R. MARRIOTT, jun., Rushden (accepted) . . . . .	214	0	0

## SCOTLAND.

For construction of a steel girder bridge over the Caledonian (Dundee and Perth) Railway, near Ninewells Junction, and other works, masonry, &amp;c.; (No. 2) steel, &amp;c., superstructure. Mr. WM. MACKISON, engineer, 91 Commercial Street, Dundee.

## Section No. 1.

Somervail & Co. . . . .	£4,988	4	0
R. Sheach . . . . .	4,509	18	5
J. Bruce . . . . .	4,456	10	11
J. Binnie & Co. . . . .	4,417	0	0
D. K. Symington . . . . .	4,314	0	10
A. & T. CRAIG, West Clepington Road, Dundee (accepted) . . . . .	4,225	17	6

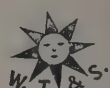
## Section No. 2.

J. O. Brettell . . . . .	2,083	7	0
Somervail & Co. . . . .	2,073	3	0
A. Findlay . . . . .	1,954	19	0
J. Binnie & Co. . . . .	1,923	0	0
R. Sheach . . . . .	1,920	11	0
D. K. Symington . . . . .	1,918	11	0
Brandon Bridge Building Company, Ltd. . . . .	1,850	11	0
Motherwell Bridge Company, Limited . . . . .	1,750	0	0
A. & T. Craig . . . . .	1,730	0	0
Beath & Keay . . . . .	1,700	11	0
ARROL'S BRIDGE & ROOF COMPANY, LTD., Germiston Works, Glasgow (accepted) . . . . .	1,678	7	0



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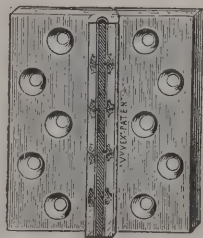
Moseley Street, BIRMINGHAM.

12 Farringdon Avenue, LONDON, E.C.

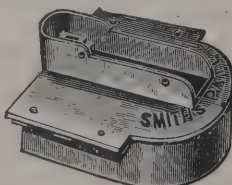
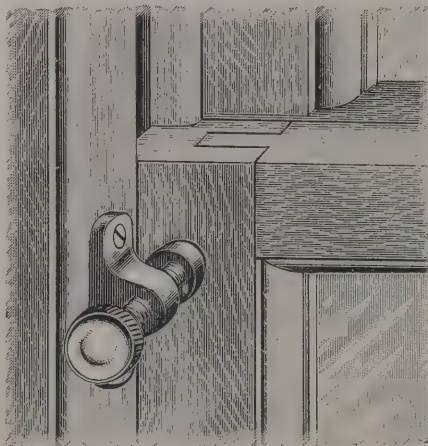
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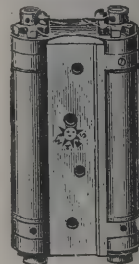
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4 x 3. 4/- pair.  
Everlasting Wear.

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MATERIAL ARE BEING OFFERED FOR SALE,  
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SPRINGS, HINGES & DOOR SPRINGS9361 R. 3" 3 1/2" 4" 4 1/2" 5"  
4/- 5/- 5/6 6/6 7/6 pair.THE ARISTON DOUBLE-ACTION  
FLOOR SPRINGS.3515. Very Light Doors, 12/-  
3516. Light Doors, 14/6.  
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Priced with Strap.



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For supply of 700 yards of hand-picked land flints. Mr. FREDERICK SLAUGHTER, town surveyor.  
G. STEVENS, Shoreham (accepted), 7s. per yard.

SOUTHALL.

For erection of isolation hospital, Southall, Middlesex. Mr. G. E. T. LAWRENCE, architect, Buckingham Street, W.C.

Kimberley	£11,248	0	0
Kellett	10,921	0	0
Higby & Rabson	10,835	0	0
Godson	10,319	0	0
B. Nightingale	9,997	0	0
General Builders, Ltd.	9,888	0	0
Thomas & Edge	9,755	0	0
C. G. Hill	9,610	0	0
G. Minter	9,500	0	0
C. Yoxall	9,471	0	0
A. & B. HANSON, Southall (accepted)	9,230	0	0
Almond & Sons	7,977	0	0

WORTHING.

For execution of private street works. Mr. F. ROBERTS, surveyor.

Manor Road.	
J. A. East	£308 17 6
E. Kellett	291 11 10
A. Crane	275 5 9
E. H. King	259 3 3
Shakespeare Road.	
E. Kellett	326 19 6
J. A. East	326 11 0
A. Crane	291 15 7
E. H. King	288 13 0
Rugby Road.	
J. A. East	684 0 0
E. Kellett	671 6 6
A. Crane	567 17 9
E. H. King	549 0 0
Providence Terrace.	
E. Kellett	152 12 6
J. A. East	152 10 0
E. H. King	138 0 9
A. Crane	133 15 7

WALES.

For alterations in the existing sewage pumping station and machinery at Gabalva, in the parish of Llandaff. Mr. JAMES HOLDEN, engineer, Llandaff Chambers, 35 St. Mary Street, Cardiff.

F. ASHLEY, 28 Conway Road, Cardiff (accepted) £464 19 0  
For erection of twenty houses at Hengoed. Mr. P. VIVIAN JONES, architect, Hengoed.

T. F. Howells	£3,990	0	0
J. F. Davies	3,920	0	0
D. Williams	3,900	0	0
J. H. JAMES, 13 Kinraig Street, Cardiff (accepted)	3,800	0	0

For supplying and laying about 750 lineal yards of stoneware pipe sewers, with manholes, lampholes, &c., and for constructing precipitation tanks, with filter-bed, at Gwaelodygarth. Mr. JAMES HOLDEN, engineer, Llandaff Chambers, 35 St. Mary Street, Cardiff.

W. Cox	£549	0	0
J. E. Evans	517	0	0
E. Osmond	506	0	0
F. Ashley	437	0	0
A. G. Collins & Co.	417	0	0
REES & WILLIAMS, Whitchurch, near Cardiff (accepted)	378	0	0

For widening and reconstructing Forge Road, in the parish of Pentyrch. Mr. JAMES HOLDEN, engineer, Llandaff Chambers, 35 St. Mary Street, Cardiff.

W. Cox	£612	0	0
A. G. Collins & Co.	537	0	0
J. E. Evans	519	0	0
J. Rees	450	0	0
E. Osmond	436	0	0
F. Ashley	433	0	0
J. Matthews	383	0	0
REES & WILLIAMS, Whitchurch, near Cardiff (accepted)	374	0	0

For erection of twelve houses at Ystrad Rhondda. Mr. JAS. JENKINS, architect, 57 Gelligaled Road, Ystrad Rhondda.

J. Rees	£235	0	0
T. Reynolds	203	0	0
W. E. Willis	195	0	0

No tender accepted, all too high.

# THE BATH STONE FIRMS, LTD.

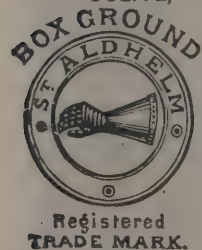
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FOR HARDENING,  
WATERPROOFING & PRESERVING  
BUILDING MATERIALS.  
To be  
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The Bath Stone Firms, Ltd.

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## SIMPLE & EFFECTIVE.

The "HANDY" Fire Bucket Tank contains 6 Fire Buckets, which are always ready with water.

THE LONDON BRIGADE HAND FIRE PUMP

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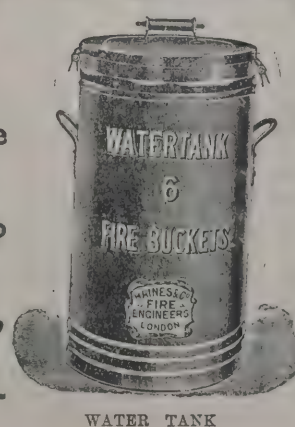
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FIRE PROTECTION ENGINEERS,

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Contractors to H.M. Government.

Telephone, 1052 Avenue.





## CORRESPONDENCE.

**The Betterment of London.**

SIR,—I ask permission to place before the public, through the medium of your influential Journal, some particulars regarding the recently established Betterment of London Association, of which I have accepted the presidency for the current year. The Press has always been foremost in the advocacy of any movement which has the public welfare at heart, and I therefore feel confident of its support in the present instance. The principal items of our programme are as follows:—

*Section I.*—To agitate for a quieter London, primarily in respect to unnecessary and objectionable street noises, such as those produced by organ-grinders, costermongers and news-boys; for a healthier and cleaner London, obtainable by a constant removal of refuse of all descriptions and in other ways; and for a more clearly designated London. In this latter respect the Association will direct attention, amongst other matters, to the illegible naming of public thoroughfares, and to the insufficient manner in which names are illuminated after dusk.

*Section II.*—To agitate against the immigration of pauper aliens (obtaining legislation thereon, if necessary); against the employment, in the streets, of children under ten years of age, and after nine o'clock P.M. of children under twelve years of age. To draw attention to the extreme danger to health engendered by the obnoxious habit of expectorating in public conveyances and buildings; to promote action against the sale of impure ice cream (another very fruitful source of disease); to direct the attention of the authorities to the Act relating to betting and gambling in public places; and to agitate against the constant digging up of the highways to the great inconvenience of the community.

*Section III.*—To impress upon the municipal and other authorities of the Metropolis the necessity of enforcing, as in Liverpool, the registration of street "musicians" and street traders, including newspaper vendors, and to impress upon the railway companies the desirability of freeing their stations and approaches from all idlers and hawkers.

From these statements it will be seen that the Association is instituted for the service of the public, and that it has at heart the desire to make London—what it certainly is not at present—the best-governed city in the world. The propaganda will be carried on by public meetings and conferences, by

deputations and petitions to local authorities, to the Office of Works, &c, by the publication of health leaflets, of literature relating to Acts of Parliament, by-laws, &c, and in various other ways.

In conclusion, I would add that if any of your readers are disposed to co-operate in this much-needed movement for the betterment of London, and thus help it to grapple with many nuisances which ought to be abolished, they should communicate with the hon. secretary, Mr. Bowden Green, at the offices of the Association, 1 Finsbury Circus, E.C.—I have the honour to be, sir, your obedient servant,

W. B. RICHMOND,  
President.

July 5, 1902.

### THE TRAMWAYS AND LIGHT RAILWAYS EXHIBITION.

THE second International Tramway and Light Railway Exhibition now being held at the Agricultural Hall, Islington, and which closes to-morrow, comprises about two hundred exhibits of a most interesting character. A general examination thereof cannot fail to impress visitors with the progress which has been made in various branches of the industry since the first exhibition was held two years ago.

The Chloride Electrical Storage Syndicate, Limited, of Clifton Junction, near Manchester, and 39 Victoria Street, S.W., show some samples of their well-known storage batteries, the appellation of "chloride" having been adopted on account of the utilisation of chloride of lead as the chief component of the negative plate. The main characteristics of the chloride "R" type battery are its mechanical strength and its ability to withstand high rates of charging and discharging—capabilities rendered essential by modern requirements. Examples of C. R. type and double C. R. type cells for large capacities and heavy discharge rates are exhibited, also samples of cells suitable for electro-pneumatic systems of control, solenoids for surface-contact systems, automatic electric signalling, lighting of car-sheds and power-stations, &c. The extended use of storage batteries in connection with electric traction systems has created a demand for some apparatus that would enable more advantage to be taken of the fact that a battery can be discharged, if necessary, at very high rates. This has been met by the Highfield patent Booster, which in combination with the chloride battery maintains a steady voltage with any

7 PALL MALL, S.W.

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THE **E.L.B.** SYSTEM **BEST**

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**CORONATION ILLUMINATIONS.**

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**BECAUSE:—**

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3. It can be **FIXED ANYWHERE** to **ANY DESIGN.**

E.L.B.

E.L.B.

**BIGGEST EFFECTS AT SMALLEST COST.**

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E.L.B.

**ELECTRIC LIGHTING BOARDS**

E.L.B.

E.L.B.

(BRITISH MANUFACTURING COMPANY, Ltd.),

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## ILLUSTRATIONS.

PROPOSED TOWN HALL, BOROUGH OF HARROGATE.

CATHEDRAL SERIES, HEREFORD: VIEW FROM SOUTH-EAST.

RHINEFIELD, HANTS: VIEW FROM THE TERRACE.

variation of the line amperes, and, moreover, enables the generating plant to work at a constant load, and when discharged through a Highfield Booster the battery is much more lively than when in simple parallel with the generator. The battery booster panel exhibited is a standard panel for a battery and booster capable of dealing with peaks of 400 amperes on a 550-volt circuit.

Messrs. Greenwood & Batley, Ltd., of Leeds, exhibit their "Zeta" type centrifugal pump, coupled direct to an electric motor. The pump is arranged for lifting water against a head of from 150 to 200 feet, while the motor is arranged for continuous current and for running at a high speed. The same firm also have a De Laval patent steam turbine dynamo, of 30 brake h-p, capacity 20 kilowatts. The steam turbine is coupled direct to a 20 kilowatt dynamo, both being erected on the same bedplate.

Among the exhibits of the Hadfield's Steel Foundry Co., Ltd., are the Hadfield's special car wheels of the most improved type. They are composed of a cast steel centre and fitted with a rolled-steel tyre, exhaustive tests having proved that the grades of steel used for the centres and tyres are the most reliable and durable for the purpose. Other items included in the exhibit are illustrations of the various types of joints; samples of their best cast-iron brake shoes; also samples of their best toughened cast-steel flangeless wheels, as well as some cases containing samples of the various classes of hammers, picks, tools, &c, which Messrs. Hadfield's are in a position to supply.

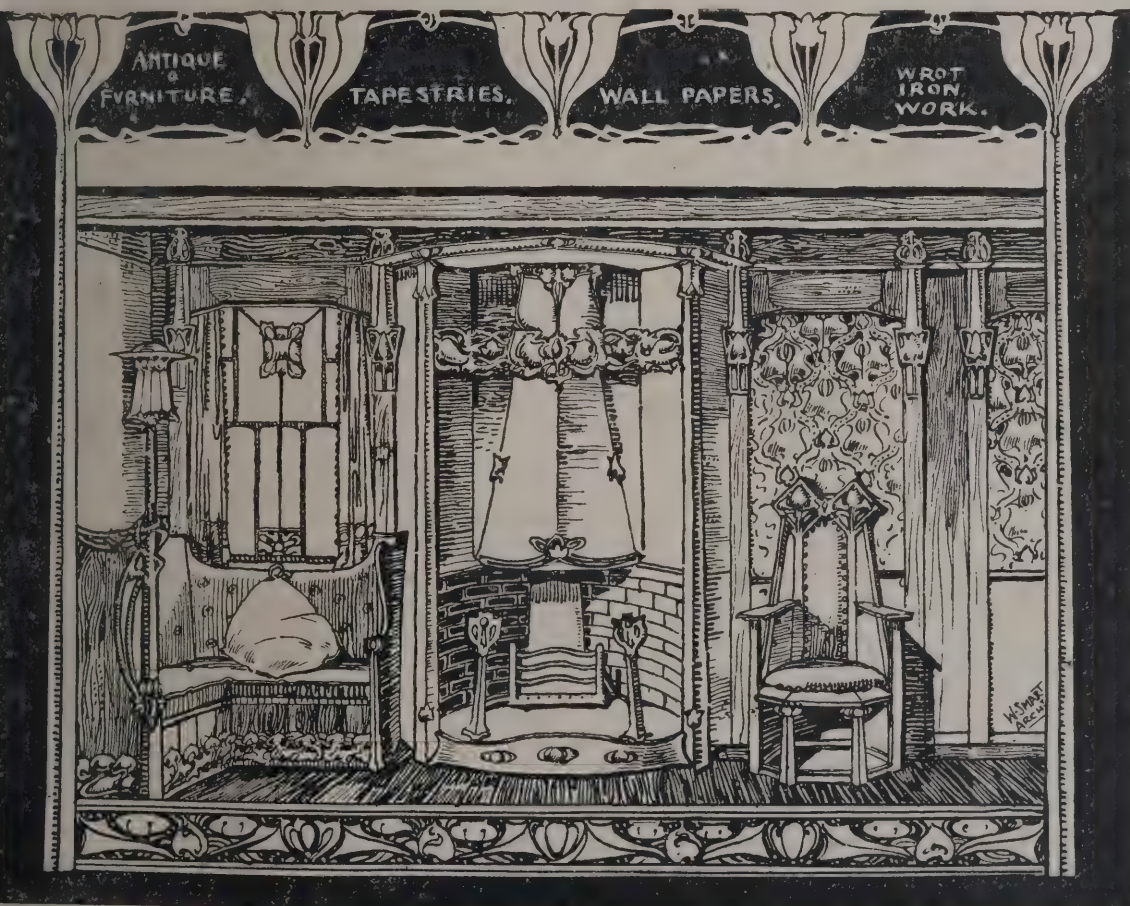
The Dowsing Radiant Heat Company, Ltd., make a display of their luminous electric radiators, which may be used for warming public halls, waiting-rooms, private houses, &c. The standard size of radiator, with four heat lamps, consumes, we are informed, one unit of electricity per hour, but may be turned down to one-half, or turned off altogether, by means of the switches supplied.

The exhibits of Messrs. Doulton & Co., Ltd., comprise specimens of the Doulton conduit, which is made with two, three, four or six rectangular ducts in one block; a full-size section of 18 way conduit constructed of 3-way ducts built up in concrete; Doulton troughs for solid-system cable laying; specimens of the Cockrill-Doulton patent system of concrete construction, carried out with tiles of special section; and a large model of Doulton's patent water-softener for steam users, &c.

Messrs. Robert W. Blackwell & Co., Ltd., have a good display of trolleys, insulating material, trucks, tramway tools and steam fittings, including an interesting selection of valves, purifiers, separators and all accessories for the power station, besides electric fittings of various kinds. At this stand are also shown samples of the well-known P. & B. ruberoid roofing, which is light and very durable, waterproof and odourless, besides possessing other merits that are widely recognised.

Among other exhibitors we may also mention Messrs. J. Kaye & Sons, Ltd. carriage wedge lock, automatic sliding door latch, and Kayes' patent locks and handles for numerous other purposes; Messrs. Mellowes & Co.'s samples of the "Eclipse" patent glazing; Albion Clay Co., Ltd., conduits and troughing (Sykes' patent); the Britannia Co., insulating material, overhead trolley line fittings, repair shop tools, and a representative display of photographs of heavy machine tools and engines; the Typewriting Telegraph Corporation, type-printing telegraph (Stelge's patent); Sam Deards, patent glazing, specially adapted for glass roofs of car sheds, electric power stations, engineering workshops, railway stations, &c; the "Simplex" Steel Conduit Co., Ltd., the "Simplex" steel conduit system for electric wiring, with special fittings and accessories. Important exhibits may be noticed besides at the stands of the General Electric Co. (1900), Ltd.; the United Asbestos Co., Ltd.; the Cape Asbestos Co., Ltd.; Dick, Keir & Co., Ltd.; the British Thomson-Houston Co., Ltd.; the Western Electric Co.; the London Basalt Stone Co., Ltd.; and J. P. Hall & Sons, Ltd.

THE St. Helen's Town Council on Saturday confirmed a recommendation of their parliamentary committee to appoint Mr. W. H. Andrew, town clerk of York, to be town clerk of St. Helen's, at a commencing salary of 800*l.*, rising to 1,000*l.* in two years. Mr. Andrew, who was present, accepted the appointment.



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## NEW CATALOGUE.

IN the new catalogue just issued by the Pulsometer Engineering Company, Ltd., of Reading—where, owing to their works at Nine Elms, S.W., having become too small for increasing business, they have established new works—illustrated particulars are given, in addition to the descriptions of the Pulsometer pump in its various forms and what it will do, of the various places where it is in actual use, and the different purposes for which it is being at the present time employed.

## TRADE NOTES.

THE Corporation of Stockport have just accepted the design and estimate of Messrs. Messenger & Co., Ltd., horticultural builders, Loughborough and London, for a large range of glass houses at Vernon Park.

MESSRS. W. POTTS & SONS, clock manufacturers, Guildford Street, Leeds, are now erecting a new eight-days' illuminated turret clock, showing the time upon three external dials, for Messrs. Gray, Peverell & Co., West Hartlepool, for Mr. Garry, architect.

MESSRS. JAMES GORDON & Co., of 52 Lime Street, E.C., have been appointed sole British and colonial agents for water-turbines, &c., manufactured by James Leffel & Co., of Springfield, U.S.A. We understand that Messrs. Gordon & Co., who have had considerable experience in this line, have several installations of these turbines at present in hand.

WE learn that improvements have lately been made at the London Hop Exchange, and that a new electric passenger machine has been erected by Messrs. A. Smith & Stevens, of Battersea. In view of much that has been said lately about foreign competition, it is interesting to note that this machine is of entirely home design and manufacture.

IT appears from the annual report (the fifty-first) just issued by the Birkbeck Building Society that the Society has again enjoyed a prosperous year, each department showing a substantial increase, and, after writing off all realised losses, there remains a clear surplus profit of 20,353*l.* 9*s.* 1*d.* for the year, thus increasing the permanent guarantee and temporary funds to 533,576*l.* 6*s.* 6*d.*, being the largest sum ever reached, while the register of shareholders now contains the names of 15,742 members, and, in addition to these, there

are 77,961 depositors, bringing up the total of members and depositors to 93,703, showing an increase on the year of 2,661.

## ELECTRIC NOTES.

THE Weymouth electric-lighting committee have recommended the Council to approve of a scheme for lighting the borough at a cost of 44,800*l.*

THE Electric Lighting Boards Company contributed to King Edward's Hospital Fund by undertaking the entire illumination of the Crystal Palace transept on the occasion of the great Empire Ball last week, and at the same time were able to do some record work so far as time was concerned. The installation comprised 2,200 lights, worked in the form of an enormous velarium over the centre of the transept, and outlining the galleries and Royal box in festoons. The lights and festoons were covered with artificial flowers, and the number of connections required some two miles of cable, as the distance from the supply source was considerable. The whole of this work was executed in three days of ordinary working hours by three men and two boys under the supervision of the foreman, including the garlandwork and very difficult fixing at great heights. The effect was so artistic that the Crystal Palace authorities retained the work for the American Festival on Saturday, and some well-known caterers propose taking over the whole of the installation.

## VARIETIES.

THE new town clerk entered on his duties at Northampton on Monday last.

THE corner-stone of the new church of St. Cyprian, Dorset Square, Marylebone, was laid on Monday afternoon.

THE consecration of a German church in Marton Road, Middlesbrough, took place on the 2nd inst.

THE Trappist monks who have settled near Kingsbridge, South Devon, have, it is said, decided to spend the sum of 30,000*l.* in the erection of a monastery.

THE Seabrook Hotel at Hythe having been taken over by a new company, has been reconstructed and refurbished, and reopened as the Hythe Imperial Hotel.

See our Exhibit at the Royal Agricultural Hall, August 12 to 22, Stand 56.

The Yale and Towne M'f'g. Co., New York.

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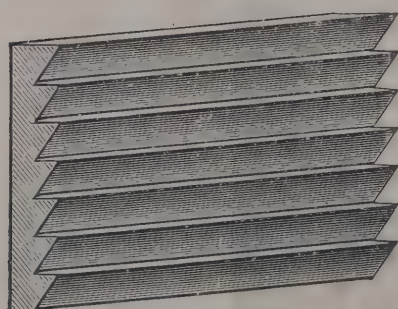
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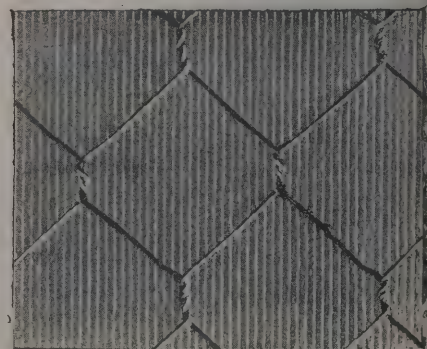
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A NEW Primitive Methodist chapel and schoolroom at Witton-le-Wear, Bishop Auckland, built at a cost of 1,500*l.*, was opened on Saturday afternoon.

AT a meeting of the finance committee of the Southampton Corporation on the 3rd inst., the salary of the town clerk (Mr. R. R. Linthorne) was considered, and after some discussion it was resolved that the salary be increased to 700*l.*, rising by three annual increments of 100*l.* to a maximum of 1,000*l.* per annum.

ON the 2nd inst. a Local Government Board inquiry was held by Col. A. C. Smith, R.E., at Newlyn, Penzance, with regard to the scheme prepared by Messrs. Merryweather & Sons, Ltd., of London, for providing a supply of water to a portion of the village from an old mine adit. The proposals include a service reservoir, standposts with waste-preventing taps and fire-hydrants. The quantity of water available is ample for all purposes.

THE National Telephone Company's exchange in London Wall was the scene of a destructive fire on Wednesday evening. Fortunately the greater number of the employes had left, and the few remaining on the premises had no difficulty in effecting their escape. The damage done is very extensive, and will result in a complete stoppage of telephone operations from this exchange for some little time, as most of the wires have been destroyed, while it is feared that the dynamos and engines, &c., in the lower part of the building will be irretrievably damaged.

THE sale by auction is announced as to take place on the 17th inst., by Messrs. Eldridge & Son, of Martin's Lane, E.C., of Thornlaw House, Thornlaw Road, West Norwood. It is described as a substantially built, freehold, detached residence, standing in grounds of half an acre, and offering excellent accommodation for a family. It contains, moreover, a specialty which, if not unique, is at least uncommon in a house of its size, in a spacious recreation-room, 33 feet by 30 feet, heated with hot-water pipes, comprising swimming-bath, 30 feet by 10 feet; studio, photographic dark-room, fitted with lead-lined sink with grating, supply tap and spray, double ruby glass windows, &c.; and a Turkish bathroom, fitted with bath, with hot and cold-water supply, and hot-room fitted with slate slab. This is an excellent opportunity of obtaining a first-class residence in a good neighbourhood and within easy reach of the City.

THE programme at the Alhambra is just now of a very attractive nature. It comprises the graceful ballet

"In Japan," with its bright music and brilliant and picturesque scenery and dresses, as well as the Coronation *divertissement* "Britannia's Realm," which consists of a series of beautiful pictures illustrating in a graceful and fanciful manner the history of the development and progress of the British Empire. It is needless to say that produced as it is under Mr. C. Dundas Slater's direct supervision, this ballet is, from every point of view, a beautiful work of art, which seems to be quite to the taste of our colonial and foreign visitors who nightly throng this popular place of entertainment. Among the numerous good turns must be mentioned Mr. Ian Colquhoun, La Belle Otero and Les Minstrels Parisiens, all of whom are old and ever-welcome favourites.

### BUILDING AND BUILDERS.

ON the 5th inst. the memorial-stone of a new masonic hall at Bellshill, N.B., was laid.

THE foundation-stone of new church halls in connection with Anderson United Free Church, Partick, N.B., was laid on Saturday.

THE memorial-stones have been laid for a new church for the Methodist New Connexion, Ryan Street and St. Stephen's Road, West Bowling, Bradford. The church will accommodate between 400 and 500 persons, and the school provides seats for 250, with nine classrooms, lecture-room, &c. It is expected that the new church will be opened in May next.

A COMMITTEE of Edinburgh School Board is at present in negotiation for a site for a school to serve the Easter Road district. The committee is in communication with the Trinity Hospital for a site in Albion Road, but the negotiations have not yet been concluded, and in the event of the two committees not coming to an understanding, the School Board committee have other sites in view. The new school is intended to accommodate about 1,200 pupils, and is rendered necessary by the great congestion at the other schools in the vicinity.

THE foundation-stone of a new church in the Leeman Road district of York was laid on Saturday last. The district forms part of the extensive parish of St. Paul's, occupying a remote corner separated from the rest of the parish by the railway, and its population, mainly working class, has increased so rapidly in recent years as to render the provision of further church accommodation absolutely necessary. The new church will be known by the name of St. Barnabas. The site

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has been presented by Mrs. Ashton, and the estimated cost of the building is 3,800/.

AN inquiry was held on the 2nd inst. at the Plumpers' Inn, Tinsley, by Mr. H. Percy Boulnois, M.Inst.C.E., relative to an application by the Rotherham Rural District Council to the Local Government Board for sanction to borrow 4,200/ for purposes of sewerage and sewage disposal. Mr. J. H. Pickford (Messrs. Oxley & Coward, Rotherham) appeared to support the application, and there were also present Mr. S. Pope, chairman of the Tinsley Parish Council and a member of the Board of Guardians; Dr. Weatherbè, medical officer of health; Mr. J. Platts, engineer; Mr. W. Booth, assistant clerk; Mr. W. S. Jackson, West Riding Rivers Board; Mr. B. Hey, sanitary inspector; Mr. Meades, Mr. G. H. Capper and others. The scheme having been clearly explained to him, the inspector visited the sewage works, and expressed satisfaction with the same and the effluent obtained. He also inspected the site of the proposed collecting tank and pumping station.

### RESPONSIBILITY FOR ACCIDENTS IN CONSTRUCTION.

ON Monday last Mr. Alexander M'Dougall, timber merchant, appeared before the High Court of Justiciary, Glasgow, charged with culpable homicide. The indictment stated that he had undertaken to erect structures in Ibrox Park, Govan, in a substantial manner, and to use red pine of the best quality for the bearers and joists supporting the flooring of the terracings of said structures, and to place or cause to be placed the said bearings or joists broken-banded or alternately long and short; whereas he did "culpably and recklessly, and in violation or neglect of his duty, fail to erect the timberwork of the said terracings in a substantial and tradesmanlike manner," and used, or caused to be used, wood of an inferior quality of yellow pine instead of red pine of the best quality, and further, that he placed the bearers and joists all short instead of alternately long and short or broken-banded, and the half of a portion of the western terracing gave way, that having been caused by the use of yellow pine instead of red pine, and by the placing of the bearers or joists all short instead of alternately long and short, a number of persons being precipitated to the ground and mortally injured.

Evidence was given by several witnesses, including Mr. A. Leitch, C.E., Mr. C. P. Hogg, C.E., Mr. Gordon, architect, and

Mr. W. G. Holmes, burgh surveyor, mainly in respect of the inferior quality of the timber.

For the defence Sir Benjamin Baker said he had made an examination of the terracing at Ibrox Park. The material used was very much below the usual standard of strength. He had fixed thirty years ago a standard of strength for timber, and he still held by it. He took 2 tons per square inch as a fair working strength of the fibres at the lower part of the beam, which was equal to about 2½ cwt. suspended from the centre. It was possible to have wood cut from yellow pine which would be twice as strong as wood cut from red pine. He would apply a test indifferently to red or yellow pine. He placed no great reliance on the figures given in text-books. Those books were in some cases seventy years old, and were based on specimens of the wood without any knots. It was not correctly affirmed that yellow pine is weaker than red. On the whole, red pine would be some percentage stronger than white pine; but for practical purposes, in which you have to take such timber as you can buy, there is nothing in any experiment that would justify you making any difference. In his experience he made no such difference. He did not blame the engineers; they applied their knowledge to the best of their ability, but, unfortunately, the only text-books available for them were not up to date.

If the experiments were properly made he would be satisfied with a factor of safety of six. With the terracing built of red pine joists he would allow a weight of 25 lbs. per square foot, as against the 94 lbs. allowed by Mr. Leitch and the 80 lbs. allowed by Mr. Holmes. If 25 lbs. had been allowed, the terracing would not have fallen down. If he had been consulted, he would have had the stand calculated to bear a pressure of 112 lbs. per square foot, instead of 25 lbs. In his judgment the structure was far too slender, and even if the best red pine had been used for the joists, the accident would have taken place all the same.

According to his practice, 25 lbs. per square foot was the weight which the stand would safely bear. From the description of the crowd it was extremely probable that the load upon the stand was 75 lbs. per square foot, or three times what he considered safe. If the timber was of atrociously bad sort, it must have been noticed before twenty-five people were killed. In all his experience he had never seen a structure so dangerously light for such a purpose.

In cross-examination witness said he did not examine specially the timber used in the terracing; he thought experts

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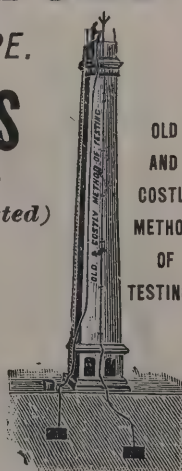
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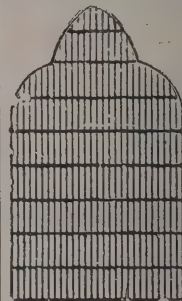
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would have dealt with that matter. By the phrase "the best quality of red pine" he meant the best quality for the purpose. He did not think it wrong for a contractor to substitute white pine for the wood named in the contract if it was equal to the purpose. He would use a wood which was fitted for the purpose; he judged the whole thing from an engineer's point of view. He admitted that he had never heard before that there was a class of timber that was known as outclassed.

Do you think it is proper to use timber for joists that is only fit for packing cases?—It would not be proper if it were not strong enough.

The Advocate-Depute (pointing to pieces of the broken timber) asked witness if he had ever seen wood of that character used for joists. Sir Benjamin explained that he had often seen wood of that character. He added that he did not care what they called the wood provided it reached his requirements. For practical purposes yellow and red pine was equally strong. The Advocate-Depute referred to a book by the witness published in 1870, where he wrote that red pine had a higher percentage. Sir Benjamin explained that that was correct in regard to the specimens experimented with, but, he added, you go back to 1870; you might as well go back to the maps of Africa in 1870. He had not the slightest doubt that the engineer did the best with the sources of information at hand. You doubt the reliability of those sources of information?—Certainly, as to their adaptability in practice.

Re-examined: If Mr. Leitch had made the proper calculation, and taken the risk of the joists that were used, the accident would not have occurred. From what he knew about crowds, he believed that these joists had been subjected to three times the load that ought to have been put upon them. He would not have put more than 25 lbs., and, judging by the crowd that was at the match, there would be, he estimated, about 75 lbs. per square foot. The joists stood three times the load which he would have put upon them. It was on account of the design of the structure that the accident took place, and the yellow pine had nothing to do with it.

Sir William Arrol stated it was his opinion that an insufficient quantity of timber was the cause of the accident. The joists were 4 feet apart, and measured 8 by 3. The crowd that would have to be carried under the circumstances was greater than any timber should be subjected to, because timber is such an unreliable material. You require to have a very large margin of safety. Even in the best-selected timber there was inequality in the planks coming out of the same tree. The

margin of safety allowed was practically 10 in every case. So far as he had been able to understand, and from his own experience, he always thought that yellow pine, if good, was a better class of timber than red pine; there were fewer knots in it. The yellow pine used was a fair average quality. The accident was caused by the fact that the structure was too light. The question of yellow or red pine had nothing whatever to do with it.

Cross-examined: He could not say he had expert knowledge, but he had an experience of over forty years, and he thought he had more knowledge than a great many joiners. There was no stability in the terracing. If it was crowded to its full capacity it must break down. He did not think there was practically any margin of safety. A structure of such a kind should have been able to carry ten times more weight than was actually on it.

Mr. Carl Bonn, C.E., said he believed that the stand gave way through lack of joisting.

The jury returned an unanimous verdict of "Not guilty."

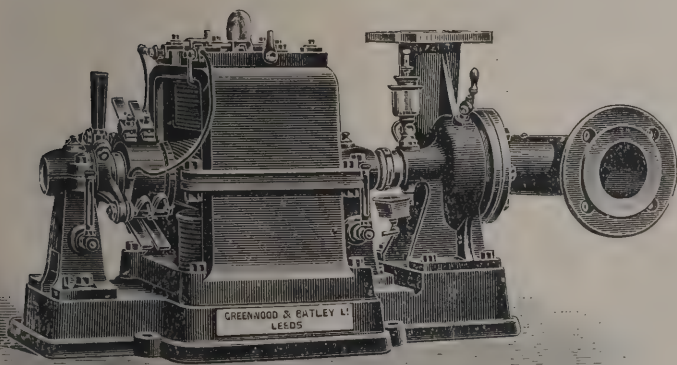
### NEW NURSES' HOME AT GUY'S.

THEIR Royal Highnesses the Prince and Princess of Wales drove to Guy's Hospital on Monday for the purpose of opening the Henriette Raphael Nurses' Home, which has been erected and equipped at a cost of 68,000 $\frac{1}{2}$ l., a portion of which was contributed by the late Henry Lewis Raphael in memory of his wife, after whom it is named. The home is built in the form of a hollow square, having on the one side a power house from which will be supplied all the motive force required for lighting, heating, lifts and pumps. On the floors above this are the laundries, and this department alone employs some forty women, as about 20,000 items of linen are dealt with every week. There is also a steam disinfectant and steriliser, an appliance of vital importance in such an institution. A subway connects the residential blocks with the hospital, and on the ground floor are the kitchens and domestic offices, while anyone who knows the general routine of a nurse's life will appreciate the boon it will be to the nursing staff to have their own meals separately cooked away from the pervading influences of invalid dietary. Special sitting-rooms for the home sister and the staff nurses are provided, while the general drawing-room is a spacious,

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lofty apartment charmingly decorated in soft pink and white. A warmer tone of old rose has been adopted for the dining-hall, which has also handsome wood panelling and will ultimately contain a fine fresco from a design now on exhibition in the Royal Academy. There are four floors, with a lift and internal and external staircases leading to each one. Upon each are from forty-eight to fifty-eight separate bedrooms, which are not mere cubicles, but apartments securing to each occupant complete privacy and quiet. Every room is prettily distempered in pale green, and furnished with bed, chairs, combination wardrobe and drawers, and a fixed basin fitted with hot and cold water-taps. Though every floor is liberally supplied with bath-rooms, a unique feature of the home is its swimming-bath, 50 feet long, with a water area of 12,000 square feet. This was a special gift from the two sons of the late Mr. and Mrs. Raphael.

### GEOGRAPHICAL NAMES FOR MANUFACTURES.

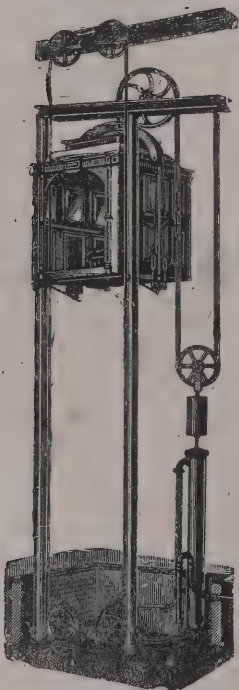
In the Chancery Division of the High Court of Justice on the 2nd inst., Mr. Justice Byrne delivered his reserved judgment in the actions Worcester Royal Porcelain Company, Ltd., v. Locke & Co., Ltd., and the same v. W. H. Rhodes, both of which involved the question of the right to use the word "Worcester" in connection with the manufacture and sale of china and porcelain.

His lordship said: In the year 1751 the first manufactory for the production of porcelain or china was established at Warmstry House, Worcester, by Dr. John Wall, in conjunction with the other persons; and the original articles of partnership commence with the recital: "Whereas a new manufacture of earthenware has been invented by John Wall of the city of Worcester, doctor of physic, and William Davis of the same, apothecary, under the denomination of Worcester porcellain." In 1772 the manufactory was sold to the Rev. Thomas Vernon, who appears to have transferred it to J. Wall, jun. It was subsequently transferred to J. Wall, sen. & Co., and in 1783 the business was sold to a Mr. Flight. In 1793 Mr. Barr was taken into partnership, and the firm name became "Flight & Barr;" other changes took place in 1837 and 1843, the firm name becoming first "Barr, Flight & Barr," and then "Flight, Barr & Barr." It so continued until 1840. In the meantime, viz. in 1786, Robert Chamberlain, who had been in the service of the Warmstry House firm, started in business for

himself, and in 1788 he established a manufactory of china or porcelain at Diglis, in Worcester. In the year 1828 Walter Chamberlain and John Lilly became the proprietors of the Diglis works, and so continued until 1840. In that year there was an amalgamation of the two firms, the works at Warmstry House were closed, and the business was then carried on as "Chamberlain & Co." at Diglis only. In 1850 and 1852 there were other changes in the firm, and in 1862 the plaintiff company was formed and acquired the business, which has ever since been carried on by them at Diglis. There had, however, been another and rival business set up in 1801, when Thomas Grainger left the service of Messrs. Chamberlain and established a new manufactory at St. Martin's, Worcester. That business was carried on first under the style of "Thomas Grainger & Co.," subsequently as "George Grainger," and afterwards as "George Grainger & Co.," until the year 1889, when this business and manufactory was also acquired by the plaintiff company, who then became the only manufacturers of china or porcelain in Worcester, and so continued until 1897, when Edward Locke, who had been in their employment, set up a new manufactory. This business, in 1898, became the property of the defendant company, who have sold, and claim the right to sell, the china manufactured by them as "Worcester" or "Worcester china." It is to restrain this, and to establish the alleged exclusive right of the plaintiff company in respect of the word "Worcester" in connection with china or porcelain and similar manufactures, that the present action is brought.

It appears from the facts I have stated that from 1786 to 1801 there were two manufactories in the hands of distinct firms; from 1801 to 1840 three such manufactories and distinct firms; and from 1840 to 1889 two manufactories and firms engaged independently in china manufacture at Worcester. The goods of all these firms became well known, and gained a very high reputation. The word "Worcester" in connection with china or porcelain and similar wares has undoubtedly for considerably more than a century acquired a secondary meaning, outside and independent of its primary geographical signification. This secondary meaning denoted and defined the goods of particular makers, the produce of particular manufactories, and is applicable as well to what I may term current manufacture for the time being as to older productions. In addition to the ordinary everyday commercial dealing in the products, as between manufacturer and dealer and between dealer and the public, in the common course of trade,

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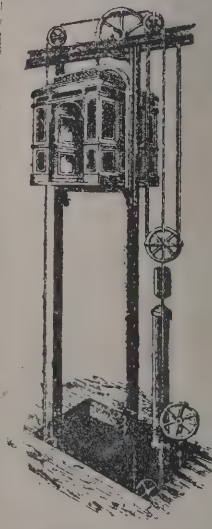
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there are and have been for many years past, owing to the intrinsic artistic merit and beauty of some of the goods manufactured by the several firms I have mentioned numerous sales of old specimens. Amongst dealers and purchasers of such old specimens the expression "old Worcester" is ordinarily used to distinguish such articles from more modern ones. The dividing line between old Worcester and modern Worcester is naturally one which shifts from time to time. But I need not dwell on this matter, as the question in the present case is, I consider, whether or not, at the date of the acts complained of, the word "Worcester" had acquired a secondary meaning as applied to china currently produced as a commercial article, and, if so, did it denote the goods of the plaintiff company to the exclusion of other goods of a similar nature.

It is not disputed that there are no natural advantages in the way of soil or water or otherwise attaching to Worcester making it specially suitable for the manufacture of porcelain; and, so far as appears, there is no reason, beyond the fact that Dr. Wall happened to be resident at Worcester, why the place was chosen originally as a seat of manufacture. More than this, although there are and have been certain typical classes of articles from time to time produced by the Worcester makers which are readily recognised as "Worcester," the manufacture has never been confined to any special types. All classes of porcelain and similar wares have been produced, and all descriptions of design, subjects and colouring have been made use of. The actual method and ingredients of the paste used has varied, and it is not contended that "Worcester" china means only china of a particular paste, glaze, style, model, design or colour. It is admitted that never at any one time has the use of the word "Worcester" denoted the goods of more than three contemporaneous firms, all of which are now represented by way of succession by the plaintiffs. From the year 1840 until 1889 the word "Worcester" denoted to all purchasers the goods produced at one or other of two manufactories and of one or other of the proprietors of such manufactories, and in and since 1889 it always denoted the goods of the plaintiff company produced at one or other of their establishments. The circumstances in the present case are not as simple as in the cases of *Seixo v. Provezende* (L.R. 1, ch. 192), *Montgomery v. Thompson* (1891, A.C. 217) and *Wotherspoon v. Currie* (L.R. 5, H.L. 521), where there had never been more than one firm whose goods were denoted by the word the use whereof was complained of, and it is argued that the word "Worcester," as applied to china, has never

designated the goods of one manufacturer to the exclusion of all others; that it has always denoted all china made in Worcester and the productions of all manufacturers past and present who have made china there. Consequently, it is said, the word "Worcester" means china made in Worcester, and any person choosing to make china in Worcester is entitled to designate his goods "Worcester" or "Worcester china." I think that this contention fails, in view of the distinction I have pointed out between the meaning of the word as applied to current trade productions and as applied to older productions of the plaintiffs' predecessors in business. In the view I take of the evidence I do not think it necessary to decide what were the rights of the plaintiffs prior to 1889 in respect of the word "Worcester," because between that date and the commencement of sales by the defendant company and Mr. Locke, their predecessor in business, the word "Worcester," as applied to current trade productions, acquired and had a secondary meaning as denoting goods made by the plaintiffs at one or other of their manufactories to the exclusion of all other manufacturers of china or porcelain and similar articles. I may, however, say that, as at present advised, I am not prepared to accept the view that the plaintiffs would have had no enforceable rights under the circumstances against a third person starting a new business and selling his goods as "Worcester china," simply because one other firm had an equal right with the plaintiffs to use the words as descriptive of their goods also.

Then it is said by way of defence that, even if the plaintiffs might otherwise have had such a right as they claim, they have lost or abandoned it by their course of conduct in reference to the designations they have given to their own goods, and otherwise. For some time prior to 1889 the plaintiffs had adopted and they still use in connection with their business the word "Royal," so that on all their business showcards relating to goods made at Diglis their goods are referred to as "Royal Worcester." Besides their registered trademark, which is impressed or printed on all their goods, but which does not contain the word "Royal," they have registered the trademarks "Royal Worcester," "The Royal Porcelain Works," "The Royal Porcelain Works, Worcester" and "The Worcester Royal Porcelain Works," and I think that, with reference to all goods made by the plaintiffs at Diglis, now called the "Royal Porcelain Works," they have from some time previously to March 1889 used as generally as possible the word "Royal" as well as "Worcester" in connection

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with their goods. The plaintiffs have also, since they acquired the Grainger Works and business, kept their works as a separate establishment, and in the showcards have always kept up the distinction between the goods made there and the goods made at the Royal Porcelain Works. Their cards describe the goods from the Grainger Works as "Worcester china manufactured by Grainger & Co., Worcester," or as "Grainger Worcester china," and they have continued to use the old trade-mark containing the words "Royal China Works, Worcester." I do not think, however, that the plaintiffs are disentitled to relief on this ground, as, although "Royal Worcester" undoubtedly does describe, and is known to describe, goods of the plaintiffs made at one of their factories, and the words "Grainger's Worcester china" in like manner describe, and are known to describe, goods of theirs made at another of their factories, I do not consider that their goods are less known and identified by the word "Worcester" without the addition of "Royal" or "Grainger's," and I may point out that in *Montgomery v. Thompson*, as appears in the early part of the speech of Lord Herschell, in advertising Stone ale the name of "Joule & Co." was generally associated with the words Stone ale (see 1891, A.C., at page 219). The defendants' showcards are four in number, in each of which the word "Worcester" is employed as descriptive of the articles advertised, and in one of them the words "Worcester china" alone appear, without the name of any manufacturer.

I am of opinion, although no actual instance of deception has been proved, that the acts of the defendants are calculated to deceive purchasers and the public into the belief that the goods of the defendants are the goods of the plaintiffs. The defendants are entitled to advertise fairly the experience of Mr. Locke, their managing director, in connection with the manufacture of china, and also fairly to describe his former employment with the plaintiffs and their predecessors in business. They are also entitled fairly to give the address of their works at Worcester. But they are not, in my opinion, entitled to use the word "Worcester" in connection with their goods without clearly distinguishing such goods from the goods of the plaintiffs. I think that none of the show-cards used by the defendants do sufficiently distinguish their goods from the goods of the plaintiffs; and, as at present advised, I do not well see how the defendants can use in immediate conjunction the words "Worcester china," "Worcester porcelain," or "Worcester ware," and at the same time sufficiently distinguish their goods from the plaintiffs. I say this as a

guide to the defendants, and to avoid, so far as I can, further discussion on a motion to commit. Put generally, the word "Worcester" ought not to be used as denoting the name or designation of the article; and I would point out that in *Wotherspoon v. Currie* (L.R. 5, H.L. 521) the fact of the word "Glenfield" being printed in large type is specially referred to as unjustifiable under the circumstances. I mention this because I should have thought one or two of the earlier show-cards used by E. Locke and by the defendants unobjectionable, had not the word "Worcester" been printed in specially large type as compared with the rest of the address, obviously, as I think, to enable the word "Worcester" to be more readily used as the denomination of the goods advertised. As to the trade-mark, although I think it very doubtful, on the whole I am of opinion its use should not be restrained. It would be fairer, however, to put the name of the defendants' works on it in the same type. The right form of injunction, having regard to what was said in *Montgomery v. Thompson*, will be to restrain the defendants, their servants and agents, from selling or offering, or exposing, or advertising for sale, or procuring or enabling to be sold, any goods made of china or porcelain or any similar material not manufactured by the plaintiffs or by their predecessors in business, or some or one of them, under or in connection with the word "Worcester," without clearly distinguishing such goods from the goods of the plaintiffs. As to the second action against the defendant Rhodes, a retail dealer, who bought articles made by the defendant company, that must, as arranged, follow the result of this action, and an injunction must be granted against him in proper form. The plaintiffs, of course, must have their costs.

A stay of the injunction in the first action, pending an appeal, was granted on the defendant company's undertaking to keep an account from this date of all sales made within the terms of the injunction, and to repay, if the appeal was unsuccessful, all profits made by virtue of such sales.

#### NEW BATHS AT LIVERPOOL.

The baths committee of the Liverpool City Council performed good work on Monday last when, in addition to formally opening the new "People's Baths" in Beacon Street, they also laid the foundation-stone of new baths which they are erecting in Lister Drive, West Derby. The first-named building stands on an area of 450 square yards, and comprises seventeen

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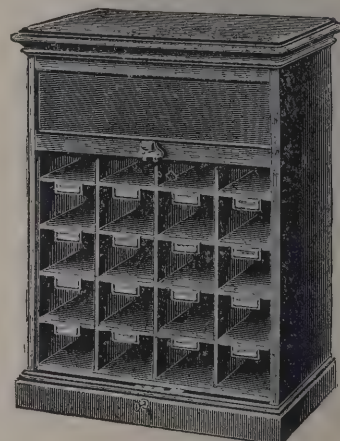
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shower and spray baths and two ordinary slipper baths. The baths are arranged in cubicles in the bath-hall and constructed in slate. Each cubicle covers an area of 7 feet by 3½ feet (just half the area covered by an ordinary slipper bathroom). It consists of a dressing-box and the shower and spray cabin; the dressing-box is provided with a seat, clothes hooks and foot-board. It is separated from the shower and spray cabin by a slate division, with passage opening having a waterproof curtain; the entrance from bath hall to dressing-box is also protected or screened by means of a curtain. The shower and spray cabin has a portion of its floor depressed, so as to form a foot-bath, the overflow of which is fixed at such a height as to allow the water to cover the bather's ankles. This allows the bather to thoroughly soap himself, and to wash his feet before using the warm spray bath or shower. The shower, which is the chief feature of the system, is placed overhead, and is formed in a circular ring, so that the water does not strike the bather's head, but falls in a gentle shower on his shoulders. As the body is cleansed, so is the dirt carried down to the feet and into the drain. When the bather is thoroughly cleansed, by the manipulation of a lever the temperature of the water can be reduced to suit. A spray or needle is fixed at one side of the cabin whereby the bather may enjoy its tonic effects.

Apart from its lower cost and economy of space, the shower and spray bath possesses many advantages over the ordinary slipper-bath, viz. it is perfectly simple, certain cleanliness is insured, all risk of infection or contagion avoided, less danger of taking cold after use, the tonic effect of the spray on the skin is valuable, stimulating the skin, thus protecting the bather against subsequent exposure. The administrative department of the establishment is simple, effective and self-contained. A small steam-boiler is provided in the basement, which will supply the steam for calorifiers to maintain the warm water at a temperature of 95 degrees Fahrenheit. It will also provide the steam for steam coils to drying-houses in laundry, and to the radiators for heating the bathing halls and waiting-rooms. There is a dwelling-house for the caretaker and his wife, containing living-room, pantry and two bedrooms. A laundry is provided for towel washing. The establishment was designed by Mr. W. R. Court, the baths and wash-houses engineer, who personally superintended its construction. The buildings are homely in appearance, and materials that have a tendency to decay have, wherever possible, been carefully excluded, and the

cost is 3,500/. The new building in Lister Drive will occupy a site of 6,500 square yards; it has a frontage to Lister Drive of 226 feet and lies between the electric generating station and Rowlands's nurseries. The buildings are set back 100 feet from the line of the street, provision being made for one swimming-bath 60 feet by 30 feet, one swimming-bath 75 feet by 35 feet and 27 private baths. Space is also reserved for an additional swimming-bath when required. The estimated cost of the establishment is 24,000/.

### THE IMPERIAL CORONATION BAZAAR IN AID OF THE HOSPITAL FOR SICK CHILDREN.

WE have had the pleasure of inspecting the excellent plans and diagrams of the buildings, stalls, &c., in connection with the Imperial Coronation Bazaar now being held at the Royal Botanical Gardens in aid of the Hospital for Sick Children, Great Ormond Street. The first aim of the designer (Mr. F. W. Speaight) has been to avoid all risk of weather, either from rain or extreme heat. With this view there is erected along the whole length of the Broad Walk a series of white Venetian masts, affixed to which on either side of the walk, at a height of 25 feet, is a lean-to awning extending over a distance of 25 feet. The stalls are erected under this, and they are designed in a simple manner with square green latticework. Attached to each mast is a large flat iron hoop ornamented with a copper heart, and evergreen wreathing, illuminated by many thousands of electric lights, is festooned from mast to mast and from mast to stall. The Bazaar buildings cover an area of 150,000 square feet, and no less than 107,480 square feet of canvas have been utilised.

The great Forecourt is situated in the centre of the Bazaar, and in it will be found the Bandstand, the American Court, and the Court of Five Arches. On either side of the entrance there are the administrative buildings, built after the style of old cottages.

At the Royal Entrance will be found Her Majesty's reception-room and also the Royal Pavilion, both artistically erected by Messrs. Waring, Limited. The whole of the Bazaar buildings have been erected by Messrs. W. Whiteley, Limited.

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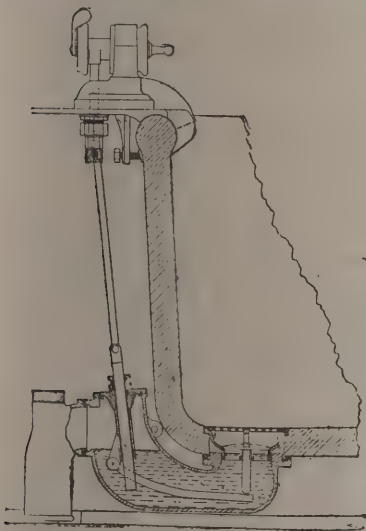
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rebuilt in 1872, and enlarged in 1893. The garden and adjoining property was purchased in 1898. There are now 200 beds at Great Ormond Street, besides 50 beds at the Convalescent Branch, Highgate, and 7,000*l.* is required each year to balance accounts, as the expenditure amounts to 19,000*l.* a year while the average income is only 12,000*l.*

### MUNICIPAL ELECTRICAL ASSOCIATION.

THE seventh annual convention of this Association was held last week at the Institution of Mechanical Engineers. Mr. John H. Rider presided. In the course of his presidential address he stated that the Association was now representative of nearly 150 municipalities. In 1895, when it was founded, there were but five electrical street tramways, all, except Blackpool, owned by private companies. At present there were thirty-six owned by municipalities, and sixteen in course of construction. With three exceptions, the whole of those were worked by the trolley system. Overhead construction cost about 5,000*l.* per mile of single track, including rails and paving, while surface contact construction cost 10,500*l.* and conduit construction 13,500*l.* Owing to aesthetic considerations, Washington, Paris, Berlin and other places adopted the conduit system in the centre of the town, with the overhead system outside, and several corporations, including Bournemouth, had done the same thing; but it was really not worth while. It was true that the examples of overhead construction to be seen in several towns in the United Kingdom were anything but pretty, but that was the fault of the designer, and not of the system. It was perfectly easy and practicable to erect an overhead line which would look well in any locality. Neat, and even artistic, work cost very little more than rough and unsightly work. With reference to guard wires, the Board of Trade had recently issued a new set of regulations based practically upon those adopted by the Post Office. In order to hear the views of the various tramway authorities upon those regulations a conference was held on June 20 last at the offices of the Board of Trade. On the advice of the officials of the Post Office and of the National Telephone Company, the Board refused to allow the principles of guard-wire protection to be discussed. Guard wires might be a protection in a few cases, but in the large majority they were the means of causing the very accidents they were intended to avoid. They were a constant trouble to maintain,

and were very liable to break when heavy telegraph or telephone wires fell upon them. The root of the matter was to prohibit entirely uninsulated wires of any kind to cross the trolley wires. If telegraph and telephone wires must be erected overhead, they should only be allowed to cross the streets at right angles, the spans should be kept exceedingly short, and the wires carried as high up as possible, in order that a broken wire might not reach the street. They should be insulated at such crossings, and if guards were insisted upon in addition they should be provided by a netting under the telephone wires, and not over the trolley wires. The recent accidents which had happened in Liverpool and other towns had been caused just as much by the telephone wires as by the trolley wires, but in the mind of the public they were called trolley wire accidents and nothing else. If local authorities would insist that all telephone wires should be placed underground there would be no necessity for guard wires or such unsatisfactory half measures.

In the afternoon visits were paid (alternatively) to the generating station of the Central London Railway at Shepherd's Bush, to the generating station of the Metropolitan Electric Supply Company, Willesden, and to the works of the Incandescent Electric Lamp Company at Wood Green.

Mr. H. Faraday Proctor, city electrical engineer, Bristol, read a paper on "Notes *re* Earthing," in which he took the view that the three-wire distributing systems were chiefly useful when the neutral conductor might be earthed. The neutral conductor of a distributing system from the consumer's and the fire-office point of view should be earthed at as many points as possible; and, where this was done at many points, it was to the advantage of all parties for the current to be alternating. Although troubles might then be experienced if earth-return telephones were used, a state of equi-potential could be most easily arranged for from a transformer-fed system, when no troubles from electrolysis could exist. In the course of the subsequent discussion, Mr. Trotter, of the Board of Trade, said he had been shown a surprising list of towns on the Continent in which there was said to be no insulation at all on the middle wire, and that list went further in his mind to induce him to consider this question carefully than anything that had been brought before him. With regard to the question of how to earth the middle wire the Board of Trade had no regulations about it, but, on the other hand, he frequently told people how generally it was done and how he thought it was best to be done. There should be, in the first place, a resistance as small

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as possible, to avoid a "dead short." Then there should be an ammeter, preferably a recording ammeter. Engineers who used recording ammeters found that they greatly assisted the localisation of faults. Lastly, there must be a circuit-breaker, which would give a signal by lamp or bell when it opened. In case of a heavy leak it was better to take the risk of giving a shock to some one on the round "outer" than to have a serious burn-out.

### THE LONDON BUILDING ACT.

AT the South-Western Police Court a decision under the London Building Act respecting the proper thickness of walls was given in a considered judgment by Mr. Rose. Mr. H. Blackburn, a builder, of St. Anne's Gate, S.W., proposed to erect three shops in Norwood, and the district surveyor (Mr. Percy Hunter) objected to the plans on the ground that the builder designed the separation walls which divided the shop proper from the dwelling-rooms above of a thickness of only  $4\frac{1}{2}$  inches. Mr. Blackburn thereupon appealed to the magistrate against the objection under Section 150 of the Building Act. Mr. Hunter argued in support of his objection that the Act prescribed that all walls should be "properly bonded," and that they should be constructed of fire-resisting material; that bricks which were only  $4\frac{1}{2}$  inches thick could not be "properly bonded" because there was no room for cross-bonding, or, in trade parlance, "headers and stretchers;" and that a  $4\frac{1}{2}$ -inch wall would buckle with heat very easily, and so would, in the case of an outbreak of fire, render escape by the staircase almost impossible. The surveyor added that the clause in the Act relating to the thickness of walls was specially inserted as the result of a fatal fire at a shop close to the court, in which, through defective lack of means of egress, some unfortunate girls lost their lives; and he urged that, in view of the recent terrible fire calamity in the City, this clause of the Act should be rigidly enforced. The appellant denied that the Act prescribed any particular thickness. He knew of walls in the Strand which were under 4 inches thick, and were constructed of iron plates and concrete. He argued further that by the decision in the case of *Garrett v. Godson & Co.*, a building which comprised a shop and living rooms for the occupier of the shop was exempted from the provisions of the clause relating to the construction of walls. The magistrate said he accepted the weighty opinion of the surveyor as to the actual construction of the walls, and he therefore held, as a fact, that

a brick wall of only  $4\frac{1}{2}$  inches in thickness could not be said to be a "properly bonded" wall. The point of law, however, which the appellant had raised was difficult and doubtful; and, while he decided that the cited case of *Garrett v. Godson*—which referred to a beerhouse—did not apply in this case, he would be willing, if required, to state a case for the consideration of a superior Court. He dismissed the appeal without costs.

### SANITARY INSPECTORS' CONFERENCE.

THE fifteenth annual conference of the National Union of Sanitary Inspectors has been held at Southport. Mr. Wm. Stansfield, Manchester, presided.

Mr. J. T. Quinton, Liverpool (hon. secretary), submitted the annual report, which congratulated the members on the continued success which had distinguished the work of the union during the year. The addition to the membership roll had been twenty-eight members, two hon. members and one associated member, one associated member having been transferred to the membership list. By death, resignation or compulsory removal from the list owing to the non-payment of subscriptions, they had lost twenty-six members, eight hon. members and one associate. The union now comprised thirty-six hon. members, 339 ordinary members and thirteen associates, or a total of 398. The total last year was 402, so that there had been a slight reduction in the membership. Having regard, however, to the fact that owing to the negotiations for fusion no special effort had been made to increase the membership, and also to the action taken in removing so many members from the roll, the Council was by no means dissatisfied with the slight temporary decrease. On the other hand, the area of membership had been widely increased, no fewer than 180 districts in 30 counties now being represented, as compared with 167 last year. Financially there was a small deficit. In regard to Parliamentary legislation the Council regretted that the introduction of the long-deferred Bill for the codification and unification of the Public Health Acts had again been postponed. The Council trusted that the Public Health Bill, providing for the fixity of tenure and superannuation, which was introduced by their president, might be kept before the House, and that every member of the Union would endeavour to secure the support of his or her local member of Parliament. Premiums in connection with the

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Northern Sanitary Association prize fund had been awarded to Messrs. W. H. Coney, Wednesbury; R. J. Hughes, Rhyl; C. W. Lasker, Eccles; J. S. Lloyd, Sheffield; and J. A. Priestley, Nelson. The Council regretted they were unable to report in satisfactory terms on the question of the unification of the various associations of sanitary inspectors throughout the country. Some serious misconceptions appeared to pervade the minds of certain members of the Council of the Incorporated Association of Sanitary Inspectors, and until those were removed the Council was of opinion that unity would be impossible. Much useful work had been accomplished during the year, and the Council had every reason to look forward with confidence to the future.

The Chairman proposed the adoption of the report, and remarked that their prospects as a union were brighter than ever, although there had been a slight reduction in the membership. He hoped that members would make an effort to bring up the membership to 500.

#### *The New Factories Act.*

A paper entitled "Recent Factory Legislation, and the Duties of Local Authorities Arising Therefrom," was read by Mr. A. J. Wilde, inspector. He said that the subject dealt with an intricate portion of a sanitary inspector's duties. They all recognised the close connection between health and occupation, and they did not wonder at the heavy toll in sickness and mortality the working classes had to pay through working in vitiated atmospheres, badly ventilated workshops, and under dangerous conditions. The Factory and Workshops Act of 1901 was really a consolidating Act, and consisted of 163 sections, of which comparatively few actually affected the work of the sanitary inspectors. It did not introduce many new features, but it made some provisions compulsory, and therefore it became necessary for sanitary inspectors to make themselves acquainted with the Act. After dealing with the various definitions of the Act, a discussion took place.

Mr. Worrall remarked that if the Act was a consolidated Act, it was an extremely poor one, and made what before was extremely difficult still more complicated.

Mr. Smith (Lancaster) said that a Factory Act of 1902 should be introduced to enable them to understand the Act of 1901.

#### *Standards in Public Health Work.*

A paper on this subject was read by Mr. H. Spears, chief sanitary inspector of West Bromwich. Having defined the

term "Standard," and indicated its present scope as including the various standards set up in Acts of Parliament, model by-laws and regulations relating to public health, and having affirmed the need of standards in general, the writer proceeded to discuss the main essentials of standards as applied to sanitation. It was pointed out that standards could only be applied to men in their social relations, and that they must not be arbitrary in character. Preference was indicated for scientific standards rather than those of the ideal or artistic class, which were exceedingly variable in character. Standards, it was urged, should be definite and quantitative rather than qualitative, national rather than local, and of a progressive type. It was argued further that to secure the possibility of progression they should not be definitely laid down in Acts of Parliament, which were never up to date, but their formation should be entrusted to a single central body, that they should be readily accessible, possess an equal degree of authority, be based on corresponding lines, thoroughly adequate, compulsory in character and ought to be rigidly enforced. It was shown that existing standards were formulated by numerous authorities; that they possessed varying degrees of authoritativeness, were not based on uniform lines, local rather than national, often inaccessible, inadequate, unscientific, indefinite and unprogressive; that while they were by no means exacting, they were largely permissive, and were not rigidly enforced. The only remedy, it was pointed out, was a drastic one, and required that the whole of the existing standards should be put in the melting-pot, so that they might be remoulded once more. To secure the adoption of such reform it was stipulated that a Minister and Board of Health should be appointed, to whom should be transferred all duties now performed by the Local Government Board, the Home Office and the Board of Agriculture, which in any wise affected health, whether in the home or the workshop, and the administration of the Foods and Drugs Act. Also that such Board should, at the earliest possible moment, formulate a new set of standards, which should be absolutely authoritative, but which should be capable of modification from time to time. To secure uniformity of application the author advocated the gradual reduction of the authorities responsible for sanitary administration, until at last one body should be responsible for both formulation and application of standards, a vigorous protest being made as to the inapplicability of the principle of local option to such matters of imperial import as public health.



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# The Architect.

## THE WEEK.

A REMARKABLE action relating to architects' fees has just been concluded in Capetown. The plaintiffs, Messrs. ACKERMANN & ADAMSON, sought to recover from the Colonial Government their fees for the preparation of plans for the extension of the Capetown railway station. In 1897 plans and drawings were got out for a scheme that was to cost 170,000*l.* Afterwards they were instructed to prepare plans for a second scheme costing 286,000*l.* The next order was for a scheme costing no less than 1,000,000*l.*; then there was a fourth scheme amounting to 500,000*l.* A sum of 5,000*l.* was paid, and there was a promise of a further sum of 1,250*l.* That was in payment for the last scheme. But a sum of 425*l.* on the first scheme, 1,430*l.* on the second and 12,500*l.* on the third were claimed. The defence was that plaintiffs were not entitled to payment until all the plans and drawings were approved. Those for the first three schemes were not approved, for they were only preliminary plans. The defendants claimed the drawings of the fourth scheme. The plaintiffs expressed their willingness to hand over the drawings when they were paid for the four schemes. They denied that the work was undertaken on approval or that the work was not approved of. Sir JOHN BUCHANAN in giving judgment said it must be considered that there was an implied contract that the plaintiffs would be remunerated for their work. On a *quantum meruit* basis he calculated the value at from 8,000*l.* to 8,500*l.* His brethren, Mr. Justice MAASDORP and Mr. Justice HOPLEY, had arrived at the result in another way, and they had agreed that the estimated value should be taken at 8,500*l.* with an additional amount of 153*l.*, and as 5,000*l.* had been paid on account judgment would be for 3,500*l.* with 153*l.* costs. Mr. Justice MAASDORP thought the plaintiffs might be entitled to further damages; but Mr. Justice HOPLEY believed that all the plaintiffs were entitled to was the amount tendered by the Government and a quarter per cent. on the estimated cost of the first and second schemes, and nothing at all on the third scheme.

THE Land Transfer Acts of 1875 and 1897 relate to the registration of title for the county of London. The County Council had a right to veto the operations, but it was found that seventy-three members were in favour of a general registration of title, while there were only thirty-five opposed to the measure. The whole Metropolitan area on both sides of the Thames is now dealt with. The only part of London in which the Act is not in operation is the City. As the Act is of great public utility, for in three years properties of the total value of 34,907,642*l.* have been placed on the register, the Privy Council made an order that the Act should likewise be applied to the City. The Court of Common Council presented a petition asking for a revocation of the order. A reply has been received stating "Parliament had the fullest cognisance of all these objections, and nevertheless passed the Act without a division, and with a remarkable concurrence of support. The special reasons given for excepting the City from the operation of the Act do not appear to the Lords of the Council to be of serious weight, because, in fact, all of them are applicable to a large part of the area already within the Act. But if the City authorities desire any special provisions to be made for dealing with any of the cases that are peculiar to the City, it is understood that the Lord Chancellor would be willing to consider any arrangements that might be proposed. The date of the commencement of the operation of the order in the City has been postponed repeatedly at the recommendation of the Lord Chancellor, with the result that there has been time for the registry to get into thorough working order, and there is reasonable ground for doubt whether any of the suggested difficulties will arise. The time allowed has not been utilised by the authorities of the City, as the Lord Chancellor had expected, for the purpose of preparing any scheme for working the Act in a way specially convenient for that area. The Lord Chancellor understands that the present situation of the Lands Registry

is not inconvenient to the City. But he has expressed his readiness to consider any representation the City authorities may make to him on this subject." There are of course some valid reasons on the part of the citizens, and especially owing to the complications which arise from the independent ownership of rooms in some of the houses in the City. But the process of registration and mapping in the offices of the Registrar of the Land Registry is so perfect that no case is likely to occur which can be regarded as insurmountable. On account of the complications there is a greater necessity to bring the Act into operation within as well as without the City boundaries.

AMONG the projects which are under the consideration of the Paris Municipal Council is one for the erection of two statues in the Square de Breteuil, the subjects being LIBERAL BRUAND and JULES HARDOUIN-MANSART. BRUAND's name is seldom mentioned, although he prepared the original designs for the Invalides. MANSART's name is, on the contrary, familiar to Frenchmen, and it is surprising that an artist who is so identified with the national architecture should still be without a statue in Paris. One reason may arise from the difficulty of distinguishing between the various members of the family. NICOLAS from an early age was entrusted with great buildings in Paris. One of them was the mansion now used for the Bank of France. He began the great church of Val de Grâce, but the upper part, including the dome, is the work of LE MERCIER. HARDOUIN-MANSART, who was the pupil of BRUAND, was for about thirty years engaged on the works at Versailles. He completed the Invalides with the exception of the dome, which he designed and partly carried out. There was another member of the family, who was engaged on the church of St. Eustache. We presume there can be no objection to statues of the two artists. It is true they were both Royalists, but it would be unfair to make them responsible for the shortcomings of the age in which they lived.

THE Southport Town Council cannot be said to have acted graciously in dealing with a request from the Hon. JOHN COLLIER that the copyright in the picture by him, *In the Venusberg*, purchased for the permanent collection, might be reserved to him. When selling the picture the artist did not assign the copyright to the Corporation, and some lawyers would say it could not therefore belong to them. The request was only acceded to on condition that no reproduction of the picture should be made without the consent of the Corporation. Practically, that kind of concession is not of much use. Publishers who might be disposed to bring out a plate are likely to hesitate when there is even a remote chance of a lawsuit for breach of copyright against them. It was said that the copyright was a valuable asset, and no doubt some members of the Council may imagine that a sum may be paid for the right of reproduction which would materially diminish the taxation. The way the picture is now prized because it is believed to be a source of wealth strongly contrasts with the opposition which was raised when the purchase of *In the Venusberg* was first proposed.

ON Saturday, the 19th inst., Mr. SILVANUS TREVAIL has invited the members of the Devon and Exeter Architectural Society to join in an excursion to Truro and the vicinity. The arrival is timed for 9.36 A.M. In the city there will be visits to the new Carvedras Viaduct, the Waterfall and Victoria Gardens, the Cattle Market, Kenwyn Church, the Museum, the Cathedral, the Municipal Buildings, and various other works. Luncheon will be served at Mr. TREVAIL's house, when the speeches will be restricted to three minutes each. There will be an excursion by steamer to Falmouth, which will occupy an hour. Three-quarters of an hour will be spent in visits to the principal sights in the town, then there will be return by steamer up the river Fal, and the scenery will be observed from different points of view. After landing at Truro Mr. TREVAIL's house will be again visited, and the departure is fixed for 8.3 P.M. The conductor and host is a stickler for time, and by observing his directions a profitable and pleasurable day will be assured.





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## THE IBROX PARK STAND.

WHEN commenting on the accident at Ibrox Park, Glasgow, a week after the collapse of the stand, we said:—"The catastrophe should bring about a revision of the data for calculating the strength of such structures. It is not sufficient to consider a crowd as a dead load, weighing so much per superficial foot. It is evident from what occurred at Ibrox Park that a crowd can become a force which is destructive from its action." That conclusion was corroborated to a remarkable extent at the trial of the contractor. Sir BENJAMIN BAKER in his evidence declared he did not blame the engineers of the structure, for "they applied their knowledge to the best of their ability, but, unfortunately, the only text-books available for them were not up to date." Indeed, all who have any acquaintance with timber construction must have been surprised when it was suddenly announced that the contractor was charged with culpable homicide, on the supposition that he used an inferior quality of yellow pine instead of red pine of the best quality. Every one knows that dangerous consequences may follow from the employment of a piece of timber that is too weak for the work it is expected to perform. But when we find the reporter of the *Glasgow Herald*, in his description of the stand on the day after the accident, stating that the beams "must all have broken about the middle," it became apparent that something more was involved than the character of the timber. Experience does not warrant the belief that a great many pieces of timber will all be defective in exactly the same place, nor, by the law of probabilities, was it likely that several defective pieces would be brought together where the crowd was heaviest. The collapse of several joists in the middle testified to an excessive load, for which sufficient provision was not made.

In such a case an inquiry by specialists should have been immediately ordered by the Government, not only for the purpose of explaining how the collapse was caused, but with a view to the prevention of a recurrence of similar accidents. Some sort of investigation must have taken place, otherwise the contractor would not have been charged with homicide. But it was conducted in secret. Scottish law has its peculiar procedure which is admired in the North, but the English system is preferable in important cases, for if a contractor in Birmingham had to answer a like allegation about an Aston Villa stand there would have been a preparatory sifting of the evidence at the inquest and in the police courts. In that way the responsibility of the different parties would be more clearly apportioned.

The indictment against the contractor resolved itself into three charges, (1) that he failed to erect the timber work in a substantial and tradesmanlike manner, (2) that

he substituted inferior yellow pine for best red pine, and (3) that he placed the bearers and joists all short instead of long and short, or broken-banded. Defendant's counsel took a preparatory objection to the indictment on the plea that the use of yellow pine for red pine must have been known beforehand, and there was really no connection made out which would involve criminal responsibility for the deaths. But Lord KYLLACHY, who presided, would not accept the objections, although he stated the counsel could raise them before the jury.

The history of the contract was set forth by the manager and secretary of the Rangers' Football Club. The ground was reckoned to be sufficiently large to accommodate 80,000 people. But previous to the day of the accident not more than 40,000 persons had been present. Mr. ARCHIBALD LEITCH was asked to prepare the plans for a large stand. Tenders were invited, and six or eight were sent in. Mr. ALEXANDER M'DOUGALL's was the lowest, amounting to 5,280*l*. One of the reasons which led to the acceptance of the tender was an announcement that all timber required for the structure was in stock. The construction of the stand was completed in the spring of 1900. The whole of the woodwork was to be tarred; but there was some unexplained dispute and the joisting was not tarred. In the intervals between the seasons no means were adopted for protecting the stand. During two years and three months the joists were undoubtedly exposed to the action of the inclement and variable Scottish weather. It was also decided to set up a corrugated iron screen, and for that purpose it was necessary to insert a bolt in each of the joists, which presumably diminished their strength. It was at the bolt-hole some of them were fractured. Whether there was any misgiving about the continuous efficiency of the stand is not clear. But in March 1902 Mr. HOLMES, the burgh surveyor of Govan, was asked to report on the condition of the stand. He said, "So far as I am aware the structure has not been crowded to its utmost capacity, but some sections have." That report was submitted to the Scottish Football Association, and it no doubt helped in the selection of the Ibrox ground for the international match. On the fatal day there were no less than 68,114 persons present, and of these over 60,000 must have been on the stand.

Mr. LEITCH, the engineer, said the stands at Ibrox were the largest he had designed. He admitted sanctioning an alteration in the timber. The contractor affirmed he could not readily obtain 8 inch by 3 inch red pine, and asked to substitute 9 inch by 3 inch red pine, and that pitch pine might be employed in the place of red pine. Mr. LEITCH replied he would accept either red pine or pitch pine 9 inches by 3 inches, and pay in proportion. The work had to be performed quickly; two hundred men were



sometimes engaged, and the joists were soon covered up. In the course of the erection numerous instances happened, it was said, of the employment of inferior timber, but the contractor made no objection to the removal of the pieces. Two days after the accident Mr. LEITCH examined the stand, and discovered that "the timber, instead of being either red or pitch pine, was an inferior quality of yellow pine. The joists, in place of running long and short alternately, were all short, and the back joists, which broke, instead of being 9 inches by 3 inches, were 8 inches by 3 inches." Mr. LEITCH said he was satisfied that the cause of the fall was the inferior wood, and he attributed the whole of the disaster to the use of bad timber. In cross-examination Mr. LEITCH admitted that from politic motives, if he had to erect such a stand again, he would alter the arrangement, his meaning being that as public confidence was shaken it might be necessary to do something to give assurance of security. A letter by Mr. LEITCH to the directors, which was written in confidence, relating to the rumour that Mr. JOHN GORDON, architect, was to be appointed to superintend the reconstruction of the stand, was also read. The writer said:—"I suppose I will be the chief witness for the Crown, and if I am to appear as having been thrown overboard by the Rangers' Football Club it will certainly have a disheartening effect upon me and an equally encouraging effect on M'DOUGALL, and you and the other directors know full well that M'DOUGALL will employ every means to blacken and damage my character, as he has already done, and if in this laudable endeavour he is to obtain the assistance of the Rangers, it will be no matter of surprise if the verdict was given in his favour." He also stated that it would be most injurious to the interests of the club if it did anything in any shape or form which could be twisted into a favourable opinion for M'DOUGALL and an unfavourable one for himself.

Testimony was given by Mr. HOGG, C.E., about the joists in seven bays all breaking near the centre of their strain. They were, he said, of a very inferior quality of yellow pine. From his own experiments he ascertained that yellow pine broke down with between one-fourth and one-fifth the weight carried by red pine. But he allowed that if he designed the structure it would have been stronger, for the factor of safety was rather low.

Mr. JOHN GORDON, architect, said he made experiments, and found that while it required 12 tons 16 cwt. to break a joist of red pine, one of yellow pine broke under 2 tons 17 cwt. Allowing eighty spectators to each bay the dead weight would be 5 tons. The three yellow-pine joists in a bay would break under a dead load of 4 tons 5½ cwt., whilst red-pine joists would sustain 19 tons 4 cwt. In cross-examination Mr. GORDON confessed that his tests would have been fairer if the wood used had been subjected to the same conditions as the wood that broke down.

Mr. HOLMES, the burgh surveyor, said he was informed that first-class red pine was to be employed, and on that assumption he approved of the plans. In his inspection he confined his attention to the steel columns. He had no doubt that the cause of the accident was the inferior quality of the wood. He believed five was a good factor of safety for a dead load, and seven for a live load. A competitor for the contract declared that the wood was below what was termed inferior, and was in fact out-classed.

All the witnesses for the prosecution were alike certain about the cause of the accident. They had no hesitation in asserting that the quality of the timber was alone to blame. Yet the burgh surveyor had suggested to the designer the advantages of substituting steel for timber, and the only reply proffered was that as the duration of the lease was only for ten years a permanent structure would be too costly. It was allowed by another witness that he would have made use of a larger amount of timber. Mr. GORDON also said that if he had been constructing the stand he would have doubled the strength of the joisting. It would be interesting to know by what logical process the quality of the wood was arrived at. Professor JOHNSON, of the Washington University, is of opinion that the distinction between pines can only be perceived by microscopic examination, and it was not stated that one of the witnesses had placed a section of wood under a lens. Experience, no doubt, may often serve instead of an elaborate scientific examination. But con-

sidering the number of professors there are in Scotland it would not have been difficult to arrive at some results which would have been more satisfying to architects and engineers than any empiric knowledge.

For the defence, timber merchants and others were forthcoming who declared no less positively that the timber used in the stand was sound and well adapted for its purpose. Indeed, the counsel for the prosecution seemed to have slight faith in his own witnesses, for the strongest point in his address was the neglect of the accused to bring forward evidence about the sources from which the timber was derived, and the prices that were paid for it. Information of that kind would, he said, have ended the controversy at once. But in legal tactics the choice of evidence is left to the lawyers, and an accused person has not much discretion in the matter. It might with as much justice be argued that witnesses did not appear for the prosecution who were prepared to swear that the design of the structure was perfect. It was, in fact, admitted that in the rebuilding increased strength is to be imparted to the structure at an outlay of over 2,000%, which is nearly 40 per cent. of the original cost.

The defence boldly attacked the design. Sir BENJAMIN BAKER, whose name as the designer of the Forth Bridge is authoritative in Scotland, said the usual standard of strength was not given. He would allow for timber a load of only 25 lbs. a square foot instead of the 94 lbs. assumed by Mr. LEITCH and the 80 lbs. by Mr. HOLMES. The stand would safely bear 25 lbs. per square foot, and the crowd probably weighed 75 lbs. per square foot, or nearly three times the safe load. In all his experience he had never seen a structure so dangerously light for the purpose it was to serve. It was on account of the design of the structure that the accident took place, and the yellow pine had nothing to do with it. Sir BENJAMIN would not accept as accurate the figures which are put down in the text-books as marking the differences between the red and yellow pine. They were based, he said, on specimens without any knots. Sir WILLIAM ARROL doubted whether there was practically any margin of safety allowed. Mr. CARL BONN, who had charge of the structural part of the Glasgow Exhibition, analysed the formation of the stand more closely than any of the other witnesses. He ascribed the cause of the accident to the want of strength in the joisting. The substitution of yellow pine had nothing to do with the accident; the wood was of very good quality. The stand as designed could only sustain a load of 26 lbs. per square foot, and it ought to be equal to 190 lbs. There should have been six times as many joists if the structure were protected, and nine times as many if it were exposed to the weather. The tests made for the prosecution were also described as unscientific.

It would be impossible for any ordinary jury, after hearing statements so confidently expressed on both sides, to be certain about the real cause of the disaster. Doubts must have been excited in their minds, and under the circumstances they could hardly fail to give the accused the benefit of them. The opinion of experts is likely to be divided on the subject. On that account it is to be regretted that an official examination of the stand was not undertaken by command of the Government. Men in Glasgow may be more hazardous in dealing with timber than men elsewhere. It will be remembered that some years ago a new play-shed in the yard of a Board school collapsed, killing or maiming a large number of little children who had gone there for shelter. The data relied on in that case by the architects may also have served for the structure in Ibrox Park, and what guarantee is there that figures of a different kind will be henceforth substituted?

It should be borne in mind by designers that the experiments on timber cannot have the precision of those on steel and iron. Uniformity is so rare, it seems useless to be piling up a variety of results. BAUSCHINGER, who devoted his life to the strength of materials used in construction, made very few experiments on timber. Until the United States Government tests are complete, there will not be sufficient results obtainable to be a guide to practice. Many thousands of experiments have been already conducted, but the officials will not arrive at any positive conclusions for the present. In one of the statements relating to pine it is said:—"The variation in



strength, as will be seen from the tables, in wood of the virgin forest is in some species so great that by proper inspection and selection values differing by 25 to 50 per cent. may be obtained from different parts of the same tree, and values differing 100 to 200 per cent. within the same species. These differences have all their definite recognisable causes, to find and formulate which is the final aim of these investigations." To say, then, that red pine has a transverse strength of 1,535 lbs., while yellow pine is 1,185 lbs., as in the table books, is to give an illusion of constancy to a material which continually varies. Wood is an organic substance; or, as the United States specialist, Mr. ROTH, says:—"It is a structure just as much as a railroad bridge or a balloon frame, and as such varies greatly even in the wood of the same tree, nay even of the same year's growth of the same cross-section of a log." Where so much is doubtful it is dangerous to be dogmatic, and one effect of the M'DOUGALL trial we hope will be to persuade practical men to be cautious not only in depending on timber, but in making assertions about its qualities. When they have to employ it largely in structures there is sure to be risks in any excess of economy. It should be a rule to use the material with dimensions that will allow of contingencies, or not at all.

### THE ENCYCLOPÆDIA BRITANNICA.\*

FROM the time of the first encyclopædia objections have been raised against the alphabetical arrangement. COLERIDGE, as became a philosopher who was always insisting on method, sketched the plan of the "Encyclopædia Metropolitana," which was to obviate the inconvenience which was assumed to be inherent in all other works of the class. Without discussing the important question which is involved in the construction of encyclopædias, there is no doubt that students of technical subjects find a pleasure when in more miscellaneous articles they meet with information which they did not anticipate. It corresponds with that unexpected delight in music or pictures on which Mr. HERBERT SPENCER has laid emphasis, and which he maintains is the most enjoyable. On that account the interest for a particular class of readers in the volumes of the "Encyclopædia Britannica" is not confined to the special and comprehensive treatises which are one of the characteristics of the work, and were prepared for their benefit.

The prefatory essay to the third volume, by Dr. H. S. WILLIAMS, on "The Influence of Modern Research on the Scope of World History," has, for example, much which is interesting to all who study art. Lord BYRON was indignant with the Government of the time for purchasing the Elgin Marbles. They were then regarded merely as pieces of sculpture which were inferior in value to the *Apollon Belvidere*, but which conjointly might act as a substitute for that unattainable figure. They were supposed to be adapted for pleasing people who were never likely to be enthusiastic about art. There can be no doubt the Parthenon sculpture has rendered invaluable service in elevating English taste, but now and henceforth it can serve a new office as an exponent of evolution. Dr. WILLIAMS, after describing LAVARD'S discoveries at Nineveh, which added an Assyrian room to the British Museum, says:—

If we would judge how direct and unequivocal was the impulse which the dying nation transferred to the adolescent one in point of art, we have but to take a few steps in the British Museum, from the Assyrian room to the wonderful hall that holds Lord Elgin's trophies from the desecrated Parthenon. Look, then, upon the frieze of bas-relief that bears the magic name of Phidias. If anything can reconcile us to the act that deprived Greece of her priceless heirlooms, it is the fact that they have found lodgment here close to their Oriental prototypes, where half a million visitors each year may at least have an opportunity to learn the lesson that human progress is an accretion, a growth, a building upon foundations; and, specifically, that Greek art, no less than

other forms of human culture, was an evolution, and not an isolated miracle. For what is the Parthenon frieze, as we now come to it fresh from the palaces of Nineveh, but an Assyrian frieze adapted to the needs and ideals of another race and developed by the genius of a newer civilisation? The profiled figures in low relief coursing together, are they different in conception from the profile figures of the palaces we have just left? The horses of the Parthenon frieze might almost seem to have stepped bodily from the palaces of Assur-bani-pal. They have gained something in suppleness of limb, have altered their attitude in a measure, to be sure, thanks to their new environment. But their type has not changed by so much as an actual breed of horses might be changed in as many generations. Note the head, the most typical and characteristic feature of this Grecian steed. Line for line it is the same head, trappings aside, that we have just seen at Nineveh. Even the defects of the Assyrian drawing are there—the too small and slender face and receding lower jaw, the tiny ear, the far too full and "chuffy" neck. Possibly no horse in nature was ever like this, but the Assyrian artist so conceives it; the Greek copies that conception; and the distorted type will be transmitted down the generations to the Italian of the Renaissance, to the classical painters of Spain, the Netherlands, and Germany and France, nay, even to the artist of the nineteenth century. The court artist of an Oriental prince of the ninth or tenth century B.C. conceives a certain ideal; and, following him, a certain type of sculptured horse, such as the artist who carved it has never seen, steps before the chariots on Napoleon's Arc de Triomphe in nineteenth-century Paris.

A passage of this kind does not become less effective because we find it in an article that mainly relates to Biblical chronology. Evolution in art is again considered under the head of Egyptology. By means of modern research it is possible to ascend to a period about 7,000 years B.C., when there was a change in the climate of Egypt. We can realise the forms of the emigrants of that time, when women with the lower jaw covered with hair were accepted as beautiful. Through art much is ascertained about the succeeding races and their rulers. The advancement of knowledge is suggested when it is said that in 1880 an article appeared on the subject in the ninth edition of the "Encyclopædia" revealing that scarcely anything was known about the age of Egyptian products. Now the date of an object has become as important almost as its form. The character of Egyptian architecture has long been established, and probably no exploration will increase our acquaintance with it. But in the article on the Coptic Church there is a suggestion that the native style was not without its influence on the buildings for the creed. The basilica type was imitated, but we are told "the use of the dome by Coptic architects is almost universal, and nearly every church has at least three domes overshadowing the three altars. The domes are sometimes lighted by small windows, but the walls are windowless and the churches consequently gloomy." The domes no doubt were inspired by Eastern traditions rather than Roman examples.

It is a wide jump from Egypt to modern copyright regulations, but an artist has nowadays to be conversant with strange transitions. Mr. E. BALE treats of some of the anomalies of existing legislation through which artists suffer. One is the belief that by receiving a docket of registration on payment of a shilling at Stationers' Hall copyright is reserved to the artist; but as it belongs to the purchaser of a picture or a statue, only by a transference from him can copyright be obtained by the producer of the work. The chief obstacle to an amendment of the law arises from photographs, although it is at present doubtful to what extent photographers are secured.

In cases of copyright labour seeks protection, and is allowed it because of its exceptional character. Ordinary labour does not, however, obtain any special care, and consequently the so-called craftsmen have of late endeavoured to gain a footing corresponding with that of privileged artists. In that way there is a contrast between modern and Mediæval times, and the subject is one which concerns the sociology of the future. The article by Professor HEWINS on "Economics" will reveal to many who have not bestowed attention on the matter that what CARLYLE called the Dismal Science has ceased to be regarded as if it were an inevitable law of nature. In any new arrangements all bearings of the labour question will have to be made the object of more sympathetic consideration than formerly. Under existing

\* The new volumes of the *Encyclopædia Britannica*, constituting, in combination with the existing volumes of the ninth edition, the tenth edition of that work, and also supplying a new, distinctive and independent library of reference dealing with recent events and developments. The third of the new volumes, being Volume XXVII. of the complete work. (Published by *The Times*, London.)



conditions it is quite possible for a man to conduct a business with profit to himself, who has no knowledge of it and could not perform any of the operations. His thoughts are concentrated on profit and loss, and in the organisation of which he is the head, he thinks compensations somehow arise from any absence of capability in his workmen. Labour, in fact, is supposed to be only a temporary and costly substitute for machinery. However, as the Professor says:—"In our own day labour disputes can scarcely ever be resolved into a question of merely pecuniary gain or loss. The significance of the amount of money involved varies greatly for different trades, and can only be understood by reference to the character and habits of the people concerned. But questions of sentiment, shop feeling and trade customs invariably play an important part." It was on account of the admission of feeling as a factor in his system of political economy that JOHN STUART MILL was treated with some forbearance by RUSKIN in "Unto This Last" and other daring books. It is a question which cannot be ignored as it has been, and a comparison of the various articles on Economics in the "Encyclopædia" is sufficient to demonstrate the trend of thought from the end of the eighteenth century until our time.

The article on Contract, by Sir FREDERICK POLLOCK, shows his customary skill in making abstruse subjects easy of comprehension by readers who are not initiated in the mysteries of legal phraseology. *Assumpsit*, which as a species of contract is a form of action peculiarly British, is a substitute for the old wager of law. The following explanation of its origin is readily understood:—

I profess to be a competent builder; you employ me to build a house and I scamp the work so that the house is not fit to live in. An action on the case was allowed without much difficulty for such defaults. The next step, and a long one, was to provide for total failure to perform. The builder, instead of doing bad work, does nothing at all within the time agreed upon for completing the house. Can it be said that he has done a wrong? At first the judges felt bound to hold that this was going too far, but suitors anxious to have the benefits of the king's justice persevered, and in the course of the fifteenth century the new form of action, called "assumpsit" from the statement of the defendant's undertaking on which it was founded, was allowed as a remedy for non-performance as well as for faulty performance. Being an action for damages, and not for a certain amount, it escaped the strict rules of proof which applied to the old action of debt; being in form for a kind of trespass, and thus a privileged appeal to the king to do right for a breach of his peace; it escaped likewise the risk of the defendant clearing himself by oath according to the ancient popular procedure. Hence, as time went on, suitors were emboldened to use "assumpsit" as an alternative for debt, though it had been introduced only for cases where there was no other remedy. By the end of the sixteenth century they got their way, and it became a settled doctrine that the existence of a debt was enough for the court to presume an undertaking to pay it.

The most important article relating to construction in the third volume is Mr. WHATELY ELIOT's on Docks. The majority of the dry docks for the United States Government have been hitherto made of timber. With so large a supply of material at hand that course was to be expected. Commodore ENDICOTT holds that timber is unfitted for docks which are to accommodate the large vessels now built, and he recommends that new docks should be formed of masonry and concrete combined. The London County Council will pretend to be surprised when they learn that he further advises that instead of being constructed by day labour and by Government employés, "they should be carried out by contract, which would be the means of greatly reducing their cost." The allied subject of Dockyards is also treated. Large sums of money are now being expended in order that those important aids to defence may be efficient. In the article on Earthquakes advice is given about the construction of buildings which will withstand the movements.

The articles we have referred to deal with topics that can be looked upon as colossal. In the same volume there are, however, a great many biographies of artists. SIDNEY COOPER is one of them. COROT, the French landscape-painter, is noticed at greater length. Although he was supposed to be original in his treatment of nature, he is described as being more traditional than is believed, and some of his trees are stated to resemble CLAUDE's.

COURBET, it is prophesied, will be remembered as a landscape and sea-painter instead of by his realistic canvases. It is remarked of P. J. CLAYS, the Belgian painter, that he was "the first to appreciate the beauty of calm waters reflecting the slow procession of clouds, the glories of sunset illuminating the sails of ships or gilding the tarred sides of heavy fishing-boats. He painted the peaceful life of rivers, the poetry of wide estuaries, the regulated stir of roadsteads and ports." We are told that whenever DAUBIGNY liked his pictures, he added another duck or two to those introduced, so that the number of ducks often indicates greater or less artistic quality in his pictures. His own experience confirmed his saying that the best works do not sell. Illustrations are given of those painters' works as well as of the *Danseuse*, by DEGAS, and *The Dream*, by DETAILLE. GEORGE DU MAURIER forms the material of an article of more than average length.

If considered as a record of what has taken place in all departments of investigation, the third volume corresponds with its predecessors and enables a more exact notion to be formed of what the tenth edition will be when it is completed. From the arrangements which have been made it is now evident that the end will be reached in a shorter time than was anticipated, and the work will thus form a unique example of expedition, accuracy and completeness.

#### A TALK ON SKETCHING.\*

WHEN the harness is off, every man instinctively goes his own way to his garden, his fishing, his courting—or, well, I go to my sketching. In the Old Country it used to be among the old churches and abbeys, the delightful country houses, the ruins rich with a thousand ancient memories, and moss-grown spots beautiful with historic stories. The old spots—ah, it is all so new in Australia—the newness—well, it has its charm—the charm that the explorer feels when he seeks to penetrate into the mists that lie beyond. But the old times will come back when, with pencil and brush, we sought for colour amid the old grey stones, and with ponderous keys unlocked the doors of crumbling shrines to gaze upon the monuments of ancient warrior and touch the brassy hand of ancient sage. There is the prevailing note of the old country and the prevailing note of the new, and it has been our privilege to touch them both. Both alike charming and intensely interesting, yet widely separated by seas, climate and history. One cannot get outside one's office in England with a sketch-book without touching something of historic interest. All the nomads who write books of their wandering fill them with historic peeps; it must be so, for all the cities and all the country are filled with the works and memories of our ancient fathers, and it is all so closely packed, so full that one need not go very far afield for subject, and then we have the rich legacy of art, left by so many generations, as well as the inspiring company of men who gather in art clubs and societies like minded with the sketcher and the artist. My sketching, I am afraid, has been the somewhat fragmentary efforts snatched in all too short spare hours from a busy life, but I have been consistent to my school-boy love right along, and hope to woo her many times again, to ask under the changing skies and by the running waters the hidden secrets of nature's expression, and to know the joy of her telling. In a short paper there is not space wherein to say much that would be reminiscent of one's sketching experiences, but naturally in the course of somewhat varied trips, there are thoughts evolved and convictions consolidated that produce ideas to rub against other men's ideas, that may be of some value to our younger members. If a man loves drawing he will draw, and if he does not he will not take the trouble to learn, and that will be his loss; but every man to his own way, and I speak to architects, whose natural expression is by drawing, the universal language in which we may consolidate our ideas, and in which we speak, even though our tongues know not the cunning of words, or the language of our foreign brethren—a language as ancient as the scratchings of prehistoric man upon the rocks and bones that mark the spot of his dwelling, and the language of countless artists and mighty people who have left their indelible carvings to remain while they themselves have centuries since mouldered to their original dust.

It is well, perhaps, to fix our thoughts under a few headings, and, first, as to

*Mediums of Expression.*—From temperament and from education will grow a man's medium in which he seeks to

\* A paper read before the Royal Victorian Institute of Architects on April 29 by Mr. Robert J. Haddon, F.R.V.I.A., F.S.A.I.A., Lecturer on Architecture, and published in the *Australian Builder*.



portray the subject matter before him, and just as one man from a bundle of pens upon the writing-table will choose his own nib, be it either fine, ball pointed, or broad, so the artist will choose the tools and substances best suited to his own feeling. The architect is invariably good with his pencil, and, speaking generally, may be relied upon for good perspective and good drawing; his weakness and his strength is inclined to detail, showing too much, overloading the picture with what his brain tells him really is there, rather than confining his attention to that which he sees. Being in his everyday work constantly engaged with the conventional drawing of line, his eyes see lines in nature where the ordinary trained artist sees mass only. This appreciation of line as line is an extremely fascinating study, but may be carried too far, for, after all, nearly all open-air objects are made up not of lines, but of mosaic-like masses of colour and form, but may be confined by lines if you will, but one better expressed by colour or washed masses or shading. A short pencil is the best, for it is more under control than a long one, nearer the tips of the fingers that answer to the will, and hence reduces the mechanical to a minimum of the feeling to the quickest means of expression. But the pencil has its limits, as has all mediums; soon we are impressed with the dignity and value of shadow masses, and then we find the need of shading. Then our pencil drawings are liable to damage by smearing, and we seek ink and pen, and a new world opens up to the sketcher. For rapidity in outdoor work he soon finds the need of the brush, and then monochrome claims him till such time as colour, the greatest of all mediums, holds him for a devotee, and from this last and greatest I question whether there is any turning back, for colour, apart from form, has its charm, and when the two are combined in happy unison, who, with the artist's eye, can resist their engaging charm? And now a few words as to

*Style.*—Style is a term hard to define. It is, however, a quality that is apparent to the cultured observer of any man's work worth the notice. Every man is in a very true sense "a part of all that he has known," and as an absorbing medium he is ever taking in (consciously and unceasingly) impressions, from the time of his early drawing lessons at school, through his office career, to long years of practice, and the quality of the man will, yea, must regulate the ultimate style of his work, and just as surely as nature has made the red flowers as distinctive from the yellow buds, and the slow-growing oak from the rapid-growing elm, so surely has each man his own peculiar quality to appreciate one kind of subject or one style of expression as distinctive from another. We have only to think for a moment of our own circle of friends and know this. One man sees the comic, the ludicrous, has a keen appreciation of the funny things of life; he has the more intent eye to catch the humorous incidents that cross his path, and if there be added to this gift the power of the draughtsman, happy is he in his work, and thrice happy his friends, who are through his gifts made partakers of his humours. Gentlemen, we cannot all be forced into the same mould and stamped off with the same die, and education everywhere is recognising this more and more in its methods of to-day, greatly, one cannot help seeing, to the progress and benefit of the rising generation. In this thought we are at the heart of nature and at the fountain-head of wisdom, where many of the vexed problems of our everyday vexing civilisation find answer. There is work for all, a place for each man's gifts, a mutual ground on which we each may appreciate the other's qualities, be they only in earnest, for outside the earnest seeker I have nothing to say. Some artists portray whatever they see with infinite pains and tiny details and exquisite finish, and enjoy those subjects that bring out in greatest relief these qualities; they delight in showing every leaf and berry on the trees, and each subtle part of the subject. Just as one man feels most at home among trees and pasture subjects, or among cattle and farmyard life, or in distinctly architectural subjects, so each man is invariably being impressed by one kind of subject more than another, and one aspect of nature more than another, the more often perhaps that which he likes best; consequently style is built up, partly through his temperament and partly by his love of particular and peculiar subjects. Personally, I must confess to a very growing love for the waters of river and sea-shore since I left the old buildings in old England. I love the sea in her deep blue vastness, her shallow greenness, her moving, minnowed bosom, her sand-girt and rock-bound shores, her spirit of lonely and eternal solitude and the skies that no smoke of grimy town dimmed atmospheres blot out; where nature is alone, save for the ships that cut the blue and sail on and on with our thoughts to their mysterious havens. Yacht and pinnace and gig and river ports and stately ships, side by side with battered hulks, have claimed my colour box more often than I can tell, and in them I see infinite variety of form, colour, movement, light and shade.

*Methods of Work.*—There are many things to say, and so many ways of going to work. Being a disciple of method and

order, I believe in a light, practical equipment, embracing all one is likely to need, yet small in compass and portable in bulk; and first a stool should be carried, one of the collapsible kind, for it very seldom happens that a seat is available at just the right point of view for the proposed sketch, and to sit upon the ground takes the eye too low, and has other disadvantages, to say nothing of possible chills. A colour box, charged with moist colours not too numerous and with good palette space, a water dipper and three good sable brushes, with a small bottle of water. Then for pencils—a H. and a B.B. are to my mind the best, but that is purely fancy, and a block (Whatman's)—that is also fancy; some prefer a book. Then a leather-covered portfolio to hold block and loose sketches, and a sheet of blotting-paper, and the sketcher is equipped. But stay, I may mention the friendly pipe, for sketchers, like fishers, love the weed, and I was about to add, a good companion; but that is in some ways a doubtful addition, as no two fellows light upon the same subject, which fact is somewhat inclined to test the ties of friendship when sketchers go together. Better to mutually agree to visit a certain locality, and after work arrange to meet and compare notes and sketches. Some sketchers' methods are like themselves, full of art and untidiness. One fellow, a good artist, who was one of a party I joined not long ago, turned out his gear when we arrived at a likely spot—a small battered cardboard box, about seven small pieces of hard, cake colours, one old brush, one common table plate, wrapped up in brown paper, two scraps of paper, that was all. Some prefer the wet method. I must say I do not, for if the paper is too wet one cannot get the work down quick enough—an all-important item in outdoor sketching, where the effects of nature are for ever changing. Most fellows I have known, and I have been out with a good many, wander about a good deal and wait for an inspiration. I find the architectural training comes in here. We have to plunge in at our work, and let the mood come after, and really it is quite wonderful how interested one does get after one has got over the first few minutes of the start, and inspiration comes in due course. In life-class sketching, rapidity of execution is very necessary, as the model can only pose for a short time in one position, and the hand must be sure of the stroke and the eye of the line. In sketching buildings, details of museum subjects, old furniture, brasses, antiques, carvings, &c., one can take full time and return again and again, and the architect may well add the measuring tape and rule to his equipment. In conclusion, one is reminded of the twofold side of a man's nature, and especially of the nature of the true architect, who should also be the true artist, the practical and constructive and directive and organising side, and the side of dreams, impressions and inspirations; no man who has enriched the world with the monuments of the greatest art, be it architecture, sculpture or painting, or the lesser arts that hover around the greater, but has been a dreamer of dreams, a-seeking amid the fields of nature, life and art for true and inspiring note of colour and form, if happily he may find them; and adding his own ego to that he knows, thus enters into the labours of those whose works remain a lasting influence for truth, for beauty and for art. Our complex city life is oftentimes too hard, too cutting; we need the relaxation of some hobby, and such a relaxation is sketching. If we seek outdoor nature, happy are we in the ever-changing beauties of sky and river and landscape, the rosy dawn, the effulgent day of these southern skies, the half twilight of dreams—dreams that make us strong, strong in the true impression, strong to pursue art and seek her whose reward is more than gold, and whose riches are brighter than the lustre of gems.

## TESSERÆ.

### The Clarendon Picture Gallery.

THE great mansion in Piccadilly erected by the first Earl of Clarendon was one of the sights of London in the seventeenth century. At the same time it created a host of enemies for the statesman, for it was believed to be erected by money stolen from the State, and it was called "Dunkirk Hall," "Tangier Hall," &c. In it was a marvellous collection of portraits representing, as John Evelyn wrote, "the former and present age." For there were the pictures of Fisher, Fox, Sir Thomas More, Tho. Lord Cromwell, Dr. Nowel, &c. And what was most agreeable to his Lordship's general humour, old Chaucer, Shakespeare, Beaumont and Fletcher, who were both in one piece, Spencer, Mr. Waller, Cowley, Hudibras which last he plac'd in the roome where he vs'd to eate and dine in publick." Many of the portraits which Lord Clarendon possessed were presents—or rather bribes, if we are to believe Lord Dartmouth, the annotator of Burnet, whose means of information cannot be disputed. Clarendon House was, it is said, chiefly furnished with the goods of cavaliers brought as "peace-offerings" to the omnipotent and ambitious Chancellor



In no other way can the formation in less than seven years of this extensive gallery be accounted for. So many fine family portraits as Clarendon possessed could not be purchased. When his taste was known there were many to pay court to the great minister by the present of a portrait. That noble picture by Vandyke of the "Earl of Derby, Countess and Child," was doubtless a peace-offering from the noble house of Stanley, and others might be named as presents, "most agreeable," to use the words of Evelyn, "to his Lordship's general humour." When in 1675 Clarendon House in Piccadilly was pulled down, the pictures with which it was so "bravely furnished" were removed to Cornbury House, in Oxfordshire, the seat of the Chancellor's son, then the second Earl of Clarendon. The second Earl would seem to have cared very little about portraits. He inherited neither his father's talents nor his general humour for collecting the faces of great men. He knew the money value, however, of what he had, and was with difficulty induced to allow Lord Paulet to take copies of his grandfather's and grandmother's pictures by Vandyke, because, as he alleged with some reason, copies would lessen the value of the originals. This unwillingness has been condemned somewhat severely by Lord Dartmouth. But was Lord Clarendon altogether his own master? Were the pictures entirely his? There is reason to think not. His father left him encumbered with debt; his own extravagances added to his difficulties, and fifty-eight pictures, including seventeen whole-lengths, were seized "at the suit of John Taylor, gentleman," for a debt of £1,200, and twenty pictures and 6,350 volumes were lost at the suit of William Fallman, for a debt of 800%. These seizures were effected in 1694. The history of the collection after leaving Cornbury House is as follows:—At Lord Hyde's death in 1753 the pictures were divided; the Duchess of Queensberry got one portion, which she removed to Amesbury, in Wiltshire, and the other half became the property of the Hon. Thomas Villiers, the first Earl of Clarendon of the present creation. The Queensberry portion passed in 1810 at the death of the last Duke of Queensberry, "old Q.," as he was called, to Lord Douglas, by whom they were removed from Amesbury, Petersham and Piccadilly to Bothwell Castle in Lanarkshire.

#### Painters' Architecture.

Many of the great masters of the Renaissance, Leonardo da Vinci, Michel Angelo, Raphael, Giulio Romano, and others, were architects as well as painters, and several buildings were executed after their designs and under their inspection. We can also consider architecture as it appears in pictures, and mixed with other objects. Among the great artists Raphael is the only one who has left a number of historical compositions in which buildings and architecture form so principal a part as may enable us to form a judgment of the result of the whole. The general character of his architecture, like that of his figures, is a sedate and simple grandeur, equally free from superfluous ornament and from strongly-marked contrasts. Neither in his works nor those of his followers shall we find many instances of those singular effects of perspective, of those groups and clusters of buildings crossing each other in various directions, of those splendid artifices which may be called the picturesque of regular and entire architecture, in contradistinction to ruins. The landscape-painter can make use of ruins of every kind without scruple and without much danger of impropriety; but history-painters are more confined, for there are, comparatively speaking, but few historical subjects where a background of ruins would be strictly proper. As they are therefore in some degree precluded from buildings in their most picturesque state (that is, where the variety of forms, tints and effects are most sudden and striking), those painters who were fond of such varieties and of all that is termed picturesque have fought for them by means not incompatible with what is due to the dignity and propriety of the historical style. This will clearly appear to any person who compares the architectural backgrounds of such artists with those of other masters who studied the higher parts of the art; as, for instance, the backgrounds of Raphael and Poussin with those of Paul Veronese and Rubens. In the works of the two last-mentioned painters those artifices and that picturesque disposition appear in all their brilliancy, and are perfectly suited to what has very properly been termed the ornamental style, as opposed to the severer character of the Roman and Florentine schools.

#### Architectural Qualities.

The emotions aroused in the mind of an intelligent expert by the contemplation of a work of pure architecture, in whatever style and of whatever race, are necessarily complex and difficult to describe; but the quality and keenness and scope of these emotions are such as have been awakened by no other of the fine arts. To the "capable eye" there is, in the first place, the charm of repose, which includes almost all the virtues of design. Then follow the gracious and caressing

appeal of technical harmony and grace in outline and proportion, in symmetry or balance of parts, in colour, texture, detail and distribution of ornament; the pleasing evidences of scholarship without pedantry; if the work is modern, of the intelligent study and adaptation of historical styles to modern use; of reserved power, of the absence of affectation or caprice; the just subordination of the personality of the author to his theme; the skilful adjustment of means to ends; the perfect agreement between construction and decoration; and, in certain cases, the glad recognition of the audacity of genius in breaking through the trammels of convention and creating a surprise which does not offend. In the second place, outside of technique, the student is moved in the contemplation of an historical monument by its poetic suggestions; by the effect of national or local spirit on the treatment of outline and detail, and of that unconscious but inevitable imprint made by contemporaneous political, religious, social, or commercial conditions, which differentiates an architectural achievement from any other work of fine art, and makes it an evidence in the history of civilisation. He has learned that the architectural monument is saturated with humanity; that it contains the essential spirit of history; and that even a Grecian Ionic capital, for instance, the decoration of a Roman frieze, of a Gothic spandrel or capital, or of the panel of an Italian pilaster of the fifteenth century, is a highly figurative image of a phase of civilisation.

#### Egyptian Proportions.

At Ombos, Lepsius the explorer was fortunate in discovering a third canon of proportions for the human body, which differs very positively from both the older Egyptian ones. The second canon is closely related to the first and oldest—of the age of the Pyramids—which, indeed, it merely carries further out, and applies with certain differences. Of both the foot, as unit, is the basis; and this, multiplied by six, corresponded with the height of the erect body; but it must always be observed, from the sole, not to the crown of the head, but only to the height of the brow. The space between the roots of the hair, or the height of the forehead and the crown, was not taken into account; and is sometimes three-quarters, sometimes half, now and then even less than this fraction of another degree. The difference between the first and second canon lies chiefly in the place of the knee. But in the Ptolemaic canon the division itself was wholly altered. The body was no longer divided, as in the second canon, into 18, but into  $21\frac{1}{2}$  parts, to the height of the brow, or into 23, including the crown. This is the division given by Diodorus in the last chapter of his first Book. The midway point between forehead and sole falls in all three systems below the pubis. From thence downwards, the proportions of the second and third canon remain the same, while those of the upper part of the body, on the contrary, vary essentially; the head is larger, the breast descends, the umbilical point rises. On the whole, the contours are more redundant, and that beautiful antique simplicity and chasteness of form in which the grandeur of style as well as its peculiarly Egyptian character lay, is abandoned for an imperfect imitation of a foreign and ill-understood style of art. The relation of the foot to the height of the body is still preserved; but here the foot as the unit no longer forms its normal foundation.

#### Position of Works of Art.

To judge fairly of art, it should be seen at home, that is, in exactly the spot and under the circumstances for which it was made, otherwise we may go away not only with wrong impressions of the artist but with a wrong lesson to ourselves. It is of importance, too, that a lover of art should know himself the conditions necessary for best exhibiting its works; these may be termed the truths of adaption. A little experience and study of the effects of light and shadow will solve any difficulties of this nature, keeping in view the art-idea. That which is made to be seen near to should not be placed above and out of sight, as are the best statues of the Milan Cathedral; nor that which should be seen above, as was intended Michel Angelo's Moses, be placed on a level with our eyes. No artist suffers more from misplacement than Michel Angelo. Position to him is all important to render his designs effective. His defective drawing, exaggerated anatomy and harsh colouring, seen at the distance intended by him, lose much of their unnatural character; yet, unlike the best works of Greece, there is in him more that is monstrous than truly grand in style, made worse often by being studied at 10 feet off, when intended to have been seen only at 50. The finish and proportion of parts depend greatly upon the distance and elevation for which they are intended. If the eye is puzzled or wearied in reading sculpture, or distracted to parts, it is a sign that it is either wrongly placed or over-finished in detail. Ornament is worse than useless that does not correctly meet the vision; its whole purpose is lost, and the artist has thrown his power to the winds.



## NOTES AND COMMENTS.

It is a common complaint with builders, especially with those who undertake alterations in houses, that many articles are supplied by their clients, and which it is understood are to be fixed or adapted at little or no expense. This is only one form of a general endeavour among people to get rid of what is known as intermediate profit. So many announcements are made of wholesale manufacturers being willing to trade directly with individual consumers, it is not surprising that people should imagine it is easy to purchase large and small articles at trade price. In such instances the purchasers are not always as satisfied as the vendors. A case was heard a few days ago in the City of London Court, before Judge LUMLEY SMITH, which reveals the lengths to which people will go in their anxiety to obtain trade discount. Messrs. EWART & SON, LTD., sought to recover 7*l.* 11*s.* 6*d.*, the balance of a debt of 28*l.* It appears that in November last a man who described himself as an engineer called at the premises of the firm to select a geyser. He was asked for his trade card, but said he did not bring it with him. A formal letter was sent to him quoting a price for providing and fixing a geyser. Some days afterwards another man called in search of a geyser, and chose one, as well as a bath, and gave instructions for them to be fitted in his house. After the work was done, caller No. 1 made a request for the account, and he was informed that it was sent to caller No. 2, for it was not supposed there was any connection between them. Whereupon No. 1, the "engineer," told the firm that what they had done was anything but a proper proceeding. The man who obtained the bath is a member of a firm in the East-end, and the engineer is a person who looks after the engines on the premises. Bath and geyser were set up in a private house; 20*l.* 10*s.* was after much correspondence paid, but it was necessary to take an action to recover the remaining 7*l.* 11*s.* 6*d.* The judge said that discount was reserved for the trade. A man who wants a bath put in goes to a builder, and the builder goes to the man who makes the bath and gets the trade discount. It is the same with engineers, but in this instance the so-called engineer was not an engineer in an ordinary sense, but simply poked a fire. His Honour accordingly left the case to the jury, and it is needless to say they found for the plaintiffs with costs. Messrs. EWART have made other people besides builders their debtors by their bold stand, and we hope the issue of the trial will be a warning to people who are constantly scheming to get discounts under false pretences.

ALTHOUGH every architect who has visited Venice must have misgivings about the stability of the foundations on which Venetian structures stand, few could have anticipated that the Campanile in the Piazza of St. Mark, which was a prominent feature in most views of the city, was doomed to collapse on last Monday morning. On Sunday the Prefect of Venice informed the Italian Minister of Public Instruction about the appearance of a crack on one of the sides. Experts were at once despatched from Rome, but their services were not required. The downfall had taken place. The marvel is that in falling so little damage was caused to the neighbouring structures, St. Mark's and the Doges' Palace, with other buildings, which are in the vicinity. But the materials appear to have descended as if they were still under static laws and must keep together as much as possible. The admired Loggia of SANSOVINO, which stood at the base, was therefore crushed, for it had to resist nearly the whole weight of the structure. It is generally accepted that the foundations were commenced by PIETRO TRIBUNO, but that the walls were owing to the Doge DOMENICO MOROSINI, who reigned in the middle of the twelfth century. It is reputed to have been finished by BUONO, the architect, who died in 1529. From the upper gallery the finest views of Venice and the surrounding land and water were to be obtained. The ascent was by means of a gentle incline, which was lighted at regular intervals by small windows. The faces were not plain surfaces, as there were piers slightly projecting, united above by arches. The pyramid capping the square tower was a much later addition, and was terminated by the figure of an angel. In the recess of one of the windows

the date 1004 is inscribed. The arcades of the upper platform were of red and green marble. It is believed that the campanile can be rebuilt, and money has been already subscribed for that purpose. There are so many views of the structure, and every course of brickwork was so familiar to Venetians, the undertaking would be less difficult than is assumed.

THE Society of Architects are now taking up the question of the Statutory Registration of Architects in earnest. Hitherto they have contented themselves by merely supporting a Bill brought forward by a voluntary committee. Now a strong representative committee have been appointed, with power to add to their number, whose duty it will be to thoroughly overhaul the present suggested Registration Bill, making such recommendations for its improvement as may appear desirable, and subsequently to obtain the opinion of the profession generally upon the subject. If the Society be supported up to this point the necessary steps will be taken to bring the matter fully and fairly before Parliament, and to use for this purpose the official staff and general organisation. A meeting of this newly-formed registration committee was held at the Society's rooms on Tuesday last, when the president, Mr. SILVANUS TREVAIL, F.R.I.B.A., was voted to the chair, and all necessary preliminary steps were taken to set this machinery in motion.

THE Metropolitan Railway of Paris will have to cross the Seine in two places. Near the Pont d'Austerlitz, which has five arches of masonry, a steel bridge of one span will be constructed. At Passy there will be another bridge also of steel, which may shortly be described as a two-decker, and so far as is known will be the first in which that arrangement has been carried out in metal. The viaduct called the Point-du-Jour is familiar to all who have travelled along the Seine; it also consists of two stages, and is looked upon as a rival to the Roman Pont du Gard. The new railway bridge will have a lighter appearance, and as M. FORMIGÉ, the architect, will be responsible for the adornment of it, we may assume it will be a worthy addition to the numerous bridges of Paris.

## ILLUSTRATIONS.

NEW TOWN HALL, HARROGATE.

THE HALL, WALMER LODGE, KENT.

WE present two illustrations showing a view of the principal hall and also a view of the main staircase at Walmer Lodge, Walmer, Kent, which form part of a large scheme of alterations undertaken last year for Mr. ALBERT OCHS, under the directions of Mr. EDWIN O. SACHS. A description of the alterations generally will be given on a future occasion. The design had to be adapted to a considerable extent to existing walls and heights. The doors and woodwork generally are of English oak, and an effort has been made to retain the surfaces as simple as possible, and to limit the carving to a few conspicuous features. The large wall surfaces left in the sides of the staircases had to be schemed in order to take certain panels of old tapestry.

A number of the panels have been fitted to act as side tables, and others to take small showcases for the Roman antiquities which were found in the garden during the excavations in 1900. Other panels, again, have been fitted to take special pictures. The electric switches, &c., also are hidden behind panels. All dado rails are fitted on the E. L. B. system, so that electric contact can be obtained at any point around the walls without difficulty. The installation of the E. L. B. system, as well as of all the special electric fittings in the hall, &c., has been by Messrs. STRODE & CO.

All glass surfaces to windows have cathedral glazing.

The whole of the joinery, as also all of the main alterations of the building, are by Messrs. GEORGE TROLLOPE & SONS, who acted as general contractors throughout under Mr. SACHS'S instructions.

CATHEDRAL SERIES.—HEREFORD: VIEW FROM NORTH-EAST.



## BRAMSHILL AND EVERSLEY.\*

**G**WENT or Y went, as the county through which we have traversed to-day was originally termed, was so named from its open downs, and even in the early Stuart days Bramshill was described as a bare and barren spot.

In 1084 there were four manors at Bromselle; two belonged to Hugh de Port, which were then estimated at the value of 20s, being exactly twice what they were worth in the time of Edward the Confessor. Associated with them were two villeins, two bordmen with a team, the quarter of a mill worth 10d., three acres of meadow, and wood for two hogs.

The other two manors in the Confessor's time were held by Alwi and Elsi, and were worth 40s. At the Conquest they passed to the hands of Gilbert de Breteuil, and were valued at only 25 pence. There was enough land for two teams, and two teams in demesne, four villeins with one team, the usual mill, six acres of meadow, and wood for two hogs. Eventually the manors were amalgamated, but at what date is not known.

Bromselle, Bromeshull, Bromshulle and Bromshyll, as the word was at various times written, derived its name from the broom with which the land abounded. The De Ports continued in possession until 1300, when the property was sold to Sir John Foxly and his wife Constance. Sir John built and endowed a chapel at Bramshill, and Sir William Foxly, who succeeded him, emparked the house. In 1341 Thomas de Woxle, constable of Windsor Castle, was in possession, and

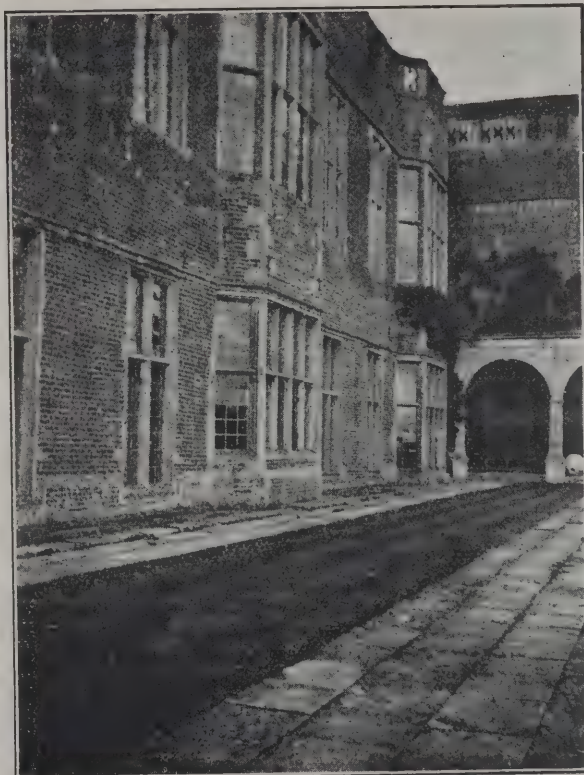
Wales's coronet, and the words Ich Dlen. On the fireplace, too, in the chapel-room, the royal arms appear with the letters I.R. and the date 1624. By a fire it has been stated that thirty-four rooms were destroyed. The house was eventually completed, though not as originally intended, for the wings are of red brick, with quoins, dressings and mullions of Headington stone. The old pipes still remain, bearing the date 1612, with the initials E. Z., and it is gratifying to note that since then the house has never suffered from any modern improvement or restoration. The postern gate with its deep stone recesses is regarded as unique, and the terraces with stone balustrades and alcoves at the corners are remarkably picturesque.

On one terrace the old game of Troco was played. The word is derived from the Spanish, Truco, a table. The game was played on a lawn with wooden balls, and cues with a spoon-shaped loop at the end. The object was to drive the balls through a ring which moved on a pivot when struck; the making of caroms, or cannons, also added to the score. Some of these curious cues and balls are preserved in the house.

In the park, hours might be spent among the splendid avenues of elms, oaks, limes and firs, and in the pleached walks and floral parterres; and these firs are believed to be some 300 years old, and were planted by Lord Zouche at the express wish of James I. They were the first ever brought to England. Charles Kingsley wrote of "James I.'s gnarled giants up in Bramshill Park, the only place in England where a painter can learn what Scotch firs are." The house he



ENTRANCE TO BRAMSHILL.



THE TROCO TERRACE, BRAMSHILL.

later owners were the Rogers and the Essex families. In 1499 Giles, Lord Daubeney, Lord Chamberlain to Henry VII., obtained possession of the land. From the Daubeneys the property passed to the Crown, and in 1547 Edward VI. bestowed it on William, Lord St. John, an ancestor of the Marquis of Winchester. Of Lord St. John we heard at Old Basing; the Bramshill manor house he never occupied. In 1660 the property was sold to Sir Stephen Thornhurst, and six years later it was purchased by Edward Lord Zouche, the eleventh baron, who held Parham Hall, and the ancient manor house, of which some foundations were exposed a few years ago, gave place to the present mansion.

A writer has suggested that Gerard Christmas was associated with the design of Bramshill, but there is little doubt that the building was finished under the direction of John Thorpe, who built Holland House, and the generally accepted tradition is that it was intended for the residence of Prince Henry, son of James I. The original design was entirely of stone, but the early death of Prince Harry in 1612 stopped the work, of which the central portion only had been erected. It is carved and decorated in the Renaissance style; each storey is divided by pilasters into richly decorated compartments, and the whole is surmounted by an elaborate pediment, bearing the Prince of

described "as looking out far and wide over the rich lowland from its eyrie of dark pines."

Lord Zouche, who was also the Lord of Hartley Wintney, remained at Bramshill until his death in 1625; his body rests at Eversley. On Midsummer's Day, 1621, George Abbot, Archbishop of Canterbury, was at Bramshill, and essaying to shoot a deer with his crossbow, by accident he killed Peter Hawkins, the gamekeeper. Kingsley, who claimed descent from the archbishop, has graphically told the story. Abbot had many enemies, and what was termed an official account of the event was published. In consequence he was suspended for four years from all episcopal duty, till a commission was appointed to investigate the matter, when the king passed a pardon and dispensation under the Great Seal. Abbot allowed the widow 20l. a year, and as an act of penance he founded Abbot's Hospital at Guildford for single men and women, and to the end of his days he fasted on a Tuesday in every month.

Bramshill was left by will to Sir Edward Zouche, of Woking, who married Elizabeth, daughter of Henry Middlemore, of Enfield; who was groom of the Privy Chamber to Queen Elizabeth; and here it may be interesting to note that when Elizabeth visited Silchester Heath on September 5, 1601, she said she "was never so honourably received into any shire; as Hampshire is a county pleasant of soile and full of delights for princes of this land who often make their pro-

\* A paper read by Mr. J. Stanley before the members of the Upper Norwood Athenæum.



gresses thither, so it is well inhabited by ancient gentlemen, civilly educated, and who live in great amity together."

From the Zouch family the property passed to the Earl of Antrim, and then to the Henleys. Old Sir Henry Henley was Master of the King's Bench, and his son Andrew settled at Bramshill, and in 1660 obtained a baronetcy. He was succeeded by his two sons—Sir Robert, who left 100*l.* a year to Eversley as an apprenticing fund, and Sir Andrew, with whom lived the famous Alexander Ross, who is recorded on two tablets in Eversley Church.

In 1695 the property was purchased for 21,000*l.* by Sir John Cope, knight, who became the fifth baronet. The Copes in early days owned extensive lands in Northamptonshire. The earliest member of the family of whom record exists was John Cope, who obtained considerable prominence in the reigns of Richard II. and Henry IV. He was twice high sheriff, and in Parliament he represented his native county. His descendant, Anthony Cope, was Vice-Chamberlain to Catharine Parr, and was knighted by Edward VI. His grandson Anthony, who had been knighted by Queen Elizabeth, was created a baronet in 1611. He was high sheriff of the county of Oxford, and married Frances, daughter of Rowland Lytton, of Knebworth. His other grandson Walter was Master of the Court of Awards in the reign of James I., and built Holland House, which in various ways resembles Bramshill. Sir William, the second baronet, represented the county of Oxford in Parliament. Sir Anthony, the fourth baronet, also figured in Parliament. Sir John, who in 1695 became the fifth baronet, represented Oxfordshire and attained high rank in the army; by him Bramshill was purchased. His second son Galen was also an army officer, and afterwards being admitted to holy orders, became rector of Eversley. John, the sixth baronet, had previously been knighted by William III. Under Queen Anne and George II. he was member of Parliament for Hampshire. His son, John, was gentleman usher to the king. Monnoux, the seventh baronet, was member for Banbury. The Rev. Sir Richard Cope, D.D., prebendary of Westminster, in 1770 became the ninth baronet. The twelfth baronet, Sir William, was minor canon of St. Peter, Westminster. Lieut.-Col. Sir Anthony Cope, the thirteenth baronet, who succeeded to the title in 1892, was major in the Rifle Brigade and fought in Ashantee. Among baronets only five take precedence of him, and among Catholic baronets he stands pre-eminent. The motto of the family, "*Æquo adeste animo*"—Be present with mind unchangeable—has ever been applicable to them. In the affairs of the county they have always taken a prominent part, and from their first occupancy of Bramshill they have remained there.

Passing through the cloistered porch, which is elaborately ornamented, we reach the great hall of old, the banqueting-room. The flooring and wainscoting are of polished oak, and the ceiling is enriched with elaborately carved pendants. There is a very large massive screen bearing carved shields, a large Gothic chimneypiece, and a fine bay window commanding a handsome view of the park. Family portraits in old frames adorn the walls, and the furniture throughout has an old-world charm. One interesting picture is *A Meet at Bramshill*; the late Sir John Cope is there, and one portrait is pointed out as the Iron Duke, though Murray states it is John Warde of Squerries, described as the Father of Foxhunters. The Duke of Wellington, however, was a frequent visitor at Bramshill, and once Queen Victoria and the Prince Consort went there with him. The drawing-room has a richly-ornamented ceiling, and the walls are covered with tapestry from designs given by Peter Paul Rubens, and worked under his personal supervision at Brussels. They tell the story of Decius. The chimneypiece reaches to the ceiling, and the fire-dogs are of unusual height. By a wide and handsome staircase lined with pictures the chapel-room is reached, which is very beautifully decorated. Near by is a large library, which admits to the gallery, 120 feet long by 20 feet wide. It has an oriel window in the centre, and contains carved chests and cabinets, musical instruments and other objects of interest; and with one chest the story of the Mistletoe Bough is associated, though I rather fancy it was Samuel Rogers who brought the story over from Italy. Most of the rooms have chimneypieces of black marble; some are 16 feet high and touch the ceiling, and many have polished wainscots, and when one was being repaired about fifty years ago, a letter from Oliver Cromwell was found behind it.

Unwillingly turning our backs on the beauties of Bramshill, we reach the parish church of St. Mary the Virgin, Eversley. It contains a vault belonging to the Copes, and among the memorials is an inlaid sepulchral brass to Richard Pendilton, who died in 1502, in the service of Giles, Lord Daubeney, and a punning Latin epitaph in rhyme to Alexander Ross, written by himself.

In a charter of Edward the Confessor, addressed to Stygand, Archbishop of Canterbury, the church at Eversley is mentioned. The monks of St. Peter's Abbey, Westminster, held the property, and William the Conqueror renewed their

rights. In 1084 we read that they held the four manors of Eversley. In 1535, when Elisha Ambrose was rector, his benefice was valued at 11*l.* 14*s.* 1*d.* Of the lords of the manors and of the various rectors it is unnecessary to speak, but a few notes on Charles Kingsley may be of interest.

We have recently heard the story of the poet Shelley, and reading through the biography of Kingsley, one's thoughts often wander to the poet of Field Place. Kingsley was an infant prodigy, and at the time when many children have scarcely learned to speak, he was writing rhymes and stringing little sermons together, for his father was a clergyman, first at Clovelly and then at St. Luke's, Chelsea. The boy was delicate and sensitive. He was fond of fishing, boating, collecting shells, and indulging in quiet studies with nature for his teacher. At school he was unpopular, and avoiding all rough games, he would wander alone in search of botanical and geological specimens. In 1836 he became a student at King's College, London, and two years later he entered Magdalene College, Cambridge, where he gained a scholarship during the first year. Fanny Grenfell, the lady who afterwards became his wife, he first met in 1839, and in his letters to her he stated how he was distressed by the Oxford movement. In July 1842 he was ordained by the Bishop of Winchester, and was appointed to the curacy of Eversley. He studied the works of Maurice, Carlyle, Arnold and Mill, and was greatly influenced by their writings. His marriage took place in 1844, and the living of Eversley then falling vacant, he was presented to it by Sir John Cope. He repaired the church and rectory, and educated the people who filled the seats that had hitherto been empty. He occasionally wrote under the name of Parson Lot, and contributed papers to the "*Christian Socialist*," which found no favour with the higher classes, for he depicted the agricultural labourer as little better than a serf, and poachers had his fullest sympathy.



WING OF BRAMSHILL.

His "*Yeast*" was described by a critic as immoral; Carlyle, though he praised "*Alton Locke*," said it was "a fervid creation still left half chaotic." In 1851, after he had preached a sermon in a London church, the incumbent rose up and protested against his teaching, and Blomfield, Bishop of London, forbade him to preach in his diocese. In 1864, without the slightest justification, he attacked Cardinal Newman and Catholics generally. The controversy was published by Newman, who certainly refuted his adversary's charges. Yet, though Kingsley as a Socialist and a confessed Darwinian was unpopular with landowners and many of his brother clergy, the Church honoured him. In 1845 he became honorary canon of Middleham, in 1859 he was appointed chaplain in ordinary to the Queen, ten years later he became canon of Chester and in 1873 was made canon of Westminster. Ill-health somewhat crippled his work in later years, and after a long voyage he died at Eversley on January 23, 1875, and was there buried, Dean Stanley taking part in the service, and afterwards preaching a sermon on him in Westminster Abbey, where his bust, by Woolner, is placed. A memorial cross was erected by his widow in Eversley Churchyard, where she now lies by his side. Kingsley had strong opinions, which he had the courage to express; he made mistakes as all men do, but though tares were mixed with the grain he was sowing, England has reaped a plentiful harvest and is the better for his work.

The parish church of Hartley Wintney is dedicated to St. John the Evangelist; the dilapidated building we saw to-day is not of old date, but it was insecurely built, and is now only used as a mortuary chapel, a later church having been erected on another site. Near Hartford Bridge a Cistercian nunnery



was founded in the time of the Conqueror by Roger Colrith, Thomas, his son, and Jeffery, the son of Peter. It was dedicated to the Blessed Virgin Mary, St. Mary Magdalene and St. John the Baptist. The Cistercian was a less austere order than the Benedictines. The order was founded at Citeaux in Burgundy in 1098 by Robert de Molesme and Stephen Harding, an Englishman of Sherborne. Their habit was white, and as a rule their homes were built at least ten miles from a town. Among the benefactors were Nicholas, Bishop of Winchester, Elias, Abbot of Reading, the Prior of Merton and Margaret Zowche, Lady of Farelehe. From the still incomplete list of abbesses which Dugdale, Tanner and Willis have collected I will only quote a few names: Emma, Sabina, Juliana, Hawisa, Roisa, Camaina de Marreys and Petronilla Pigeon. At the time of the Dissolution the house sheltered the abbess and seventeen nuns. By Henry VIII. the "scite" was granted to Richard Hill, serjeant of the king's cellar.

I am afraid my paper is rough and incomplete, but no pen picture I could hope to produce would give any idea of the beauty or interest of the district we have just passed through.

The particulars for my paper were collected from many writers; some I have incidentally mentioned, but I am also indebted to the writings of B. B. Woodward, B.A., F.S.A., the Rev. Theodore C. Wilks, M.A., George Alexander Cooke, Edward Wedlake Brayley, John Britton, Mackenzie Walcott, the Rev. C. Holme, M.A., G. Phelps Bevan, F.S.S., Robert Dodwell, E. R. Kelly, M.A., Sir Bernard Burke, Leslie Stephen, and to an article by the Hon. Mrs. Armytage which appeared in *Madame*.

The illustrations are from photographs by Mr. Henry Virgoe.

#### EDINBURGH ARCHITECTURAL ASSOCIATION.

THE annual general meeting of the Edinburgh Architectural Association was held on the 2nd inst. in the rooms of the Association, 117 George Street, Mr. Henry F. Kerr, president, in the chair. The President reported that the sub-committee appointed to deal with the subject recommended that the Association should affiliate with the Royal Institute of British Architects. There was, he said, nothing to lose and something to gain from such a step. The recommendation was adopted. Mr. William M. Page, one of the honorary secretaries, submitted the annual report, from which it appeared that twenty-two new members had been enrolled during the past session, that two had resigned and that four members had died. The total membership was now 252. Mr. J. A. Arnot, on behalf of Mr. Watson, reported that the library in connection with the Association would be available next session, and that it was proposed that it should be open two evenings in each week, and also for half an hour daily in the middle of the day.

In presenting the report of the Council, the chairman stated, in connection with Mr. Bruce's motion relative to the establishment of a chair of architecture in the University of Edinburgh, that the Council had as yet nothing definite to report. They had, however, consulted sixteen authorities in England and Scotland with the view of obtaining information on the subject. The result of these inquiries would be reported next session. He recalled that the Association had urged upon the Lord Provost very strongly that the buildings the War Office proposed to erect in the Castle next to the hospital, facing Princes Street, would be a great blot on all views of the Castle rock. He thought that their views, humbly expressed, might possibly have done some good, as he had received a letter from the town clerk to the effect that, while that official was unable to say exactly how the matter stood, he had been informed that the War Office did not in the meantime intend to erect any building at the Castle.

The President took as the topic of his address "A College of Architecture and the Technical Arts in Edinburgh." He alluded to the increased attention which was now being devoted to the theory and practice of education in all its branches. To the lovers of architecture and the technical arts the problem was presented, Are your artists and your public educated as they ought to be? In Paris there had been established for many years a great school which trained students in all the arts from architecture to gem engraving. In it an architectural student would require ten years to pass through its curriculum. There was another great school in Paris chiefly for architecture where the period of education was about five years. In Germany several colleges of like nature were to be found, and in America there were at least five universities which had a fully-developed architectural section. In England nothing approaching this existed, and in Scotland the opportunities for improvement were even fewer. In London the Architectural Association provided teaching in every branch of architectural knowledge. In other cities of England training in the technical arts had been established by the municipal authorities. In Glasgow

much good work was being done in an enthusiastic manner at the School of Art. In Edinburgh what did they find? In connection with the Heriot-Watt College some technical classes (excellent so far as they went), drawing and painting under the Board of Manufactures and the Royal Academy, and other isolated and little known studios where the bud of artistic genius was tempted to bloom. Now students of architecture in whom they were specially interested were or ought to be artists; but although artists, something more. An architect must not only be poetic but practical; his work must not only be beautiful but accurate. What was an architect the worse for knowing thoroughly the history and the styles of architecture, even though he might now and again happen to be a genius? Why should he not understand the basis of design and ornament, and exercise himself in draughtsmanship and design? Although to the artistic mind much might be the result of intuition, what harm could ensue from proper drawing out of the latent spirit? Then, on the practical side, what architect was harmed by knowing something of construction, of materials and of architectural practice? Many architects had regretted that their grasp of the capabilities of various materials had not been assisted by practically working in these materials. Would it not be a great help to have young architects try their hand at wood-working, metal-working and stone-working? This led them to the initial demand, that as architecture was not only a theoretical but a practical study, the training must be both theoretical and practical. In medicine and surgery the clinical and theoretical were combined, because they were practical professions. The effect of this training in architecture would be that usefulness, stability, endurance, appropriateness, simplicity, would all be aided by closer practical study and that hand intimacy with materials which had daily to be used. The Edinburgh Architectural Association at an early date recognised this to a certain extent when the work classes were carried on, but workshops were never added. In later years the school of applied art took the place of the work classes, still without workshops, but with great success. Although the applied arts classes were not intended for students of architecture only, but for the whole variety of the applied arts, the architectural students took the fullest advantage, to their great profit. This school of applied art as it stood was the central point of any architectural education, and should also be of the technical arts generally. All the great schools had a similar class, and must have it, and the only point to bear in mind was that design should be as well taught elsewhere as it was in the Edinburgh school. But beyond this a great development of the workshop idea was required, and a thorough curriculum of theoretical study. Every student of architecture should, of course, have a sound preliminary education to form the entrance to the requisite technical studies, and this was the general conception of at least the American schools. After passing through the school the student was placed in a practising architect's office for some three years. Such training, if wisely guided, should provide well-equipped students for the architectural profession. But as students of architecture they could not afford to lose sight of the training in the other technical arts more or less closely related to it. Painting and sculpture if sufficiently provided for in the Royal Scottish Academy need not be touched, but there were many arts in which the theory of design was one, but the methods of working were necessarily diverse. For example, their furniture designing, carpet and tapestry making, decoration, gold, silver, iron, brass, copper and bronzework all strongly co-related to architecture, and all these should be placed on a proper educational footing. And if so, why not include all the technical arts in a great central national college of architecture and the technical arts? It would be a great undertaking, but one worthy of being entertained by the capital of Scotland. Many of the arts they sought to aid owed much to past Scottish handicraft, and they might fairly endeavour to conserve the technical methods and natural character of the arts, correcting by comparative analysis the errors of decaying tradition and any unfortunate mannerisms. Now, it might be asked, How was this great college to be founded and how maintained? Many of the English municipalities supported technical and art education, and probably it might be right to expect some municipal help in this matter from the city of Edinburgh. But for this great national scheme some wealthy sons or daughters of Scotland must have their hearts touched by the claims of national art, and give of their means to preserve what remained, and to put on a proper basis the future of Scottish design. If any stimulation was required, the munificence of the Americans towards schemes of this nature in connection with their universities should call for emulation. That such a practical school for the arts was a matter of supreme moment was generally admitted, and so great was the outlook that no one could foretell the vast beneficial results that might come in the near future to redound to the credit of our land. Scottish artists in many departments had done wonderfully despite the lack of systematic and sympathetic teaching, and they could confidently look forward to further



and greater honours if students had the advantages of an ample foundation and a wise course of study in a national college of architecture and the technical arts in connection with the University.

The following office-bearers were elected:—President, A. Hunter Crawford; past-president, Henry F. Kerr; vice-presidents, H. O. Tarbolton and J. S. Syme; hon. secretaries, William M. Page and Colin B. Cowrie; hon. treasurer, W. Glassford Walker, C.A.; librarian, John Watson. Conveners of committees—Library committee, John Watson; publication committee, G. S. Aitken; sketchbook committee, John Watson. Committee of management, Thomas Ross, Professor Baldwin Brown, Daniel Macfie; from associates' section, Alfred Greig, A. Lorne Campbell, J. D. Trail. Auditors, W. J. A. Drummond, C.A., James Walker, C.A.

On the 5th inst. the annual excursion of the Association to Carlisle, Naworth and Lanercost took place. The party travelled to Carlisle on the previous evening, and utilised the short time after their arrival by walking about and viewing the Royal Agricultural show ground. On Saturday morning the town hall was first visited, by permission of the mayor and aldermen. The party was received by Mr. Graham, city treasurer, and the interesting old building was described by the Rev. Canon Bower. St. Cuthbert's Church, where are interred some of Lord Rosebery's ancestors, was next visited, and also the police chambers. Here the city mace, sword and fine old silver vessels awakened great interest. The party then proceeded to the castle, where an interesting time was spent. The entire castle buildings were thrown open for the inspection of the members, by command of Colonel Brind, and the party was conducted over them by the official guide. The magnificent views obtained from the top of the old Norman keep were much enjoyed. The cathedral was next inspected by permission of the Very Rev. Dean Henderson. The members were received by the Rev. Canon Bower and Mr. C. J. Ferguson, architect, acted as leader, and gave a descriptive account of the buildings. The conventual buildings and deanery were also visited. After lunch train was taken to Naworth, and the members drove to Naworth Castle. Lord Carlisle granted permission for the visit. The old tower and later additions, with their fine hall and quaint chambers, were of never failing interest, while the gardens and the beautiful surroundings made the visit memorable. Mr. Frederick Franklin, architect, acted as leader. The party then walked through the glen to Lanercost Priory, where they were received by the Rev. T. W. Millis. The rev. gentleman conducted the members over the church and conventual buildings and described their various features. The drive was afterwards continued to Brampton, where tea was partaken of, and the party returned to Carlisle in time for the 8.20 P.M. West Coast express train back to Edinburgh, dinner being served on board the train. Perfect summer weather favoured the outing, which was greatly enjoyed. The president, Mr. Henry F. Kerr, A.R.I.B.A., the vice-president, Mr. A. Hunter Crawford, and the honorary secretary, Mr. William M. Page, were present, the last-named having made all the arrangements for the excursion, assisted by Mr. H. Foxall, of Carlisle.

### GEORGE WASHINGTON, SURVEYOR AND CIVIL ENGINEER.\*

IT is well known in a general way that George Washington commenced his career as a surveyor, but there are no connected records of his work in that line, and the meagre information one can find in the accounts of his life does not give an adequate conception of his proficiency and activity as a surveyor or of his unusual ability and the vast amount of important work which he conceived as a civil engineer.

Washington is reported to have evinced marked aptitude for mathematics at the early age of eleven. He took a course in surveying and navigation at Mr. Williams's school, in Westmoreland County, Virginia, and become so interested in these branches that later he served a special apprenticeship in practical work under Mr. James Genn, a licensed surveyor. In the Clerk's Office of Culpeper Court House is recorded the following:—

"July 20, 1749 (O. S.), George Washington, Gent., produced a commission from the president and master of William and Mary's College, appointing him to be surveyor of this county, which was read, and thereupon he took the usual oaths."

His proficiency in this line led to his employment by Lord Fairfax in 1748, when but a boy of sixteen, to survey certain portions of his lordship's estate in the Blue Ridge Mountains. During the next four years he devoted his time to making the

surveys incident to land sales, having the general direction also of his lordship's land office.

The first record of a survey made by George Washington is as follows:—

"March y. 15th 1747-48. Survey'd for George Fairfax, Esqr. a tract of land lying on Cates Marsh and Long Marsh beginning at three Red Oaks Fx on a Ridge the N° Side a Spring Branch being corner to y<sup>e</sup> 623 Acre Tract & Extending thence N° 30° E' 436 poles to a Large Hickory and Red Oak Fx near John Cozines house thence N° 60° W' 90 poles to a Large White Oak Fx thence N° 7° E' 365 poles to Long Marsh," &c.

Another record of his early work is as follows:—

"SURVEY'D for Richard Barnes, Gent of Richmond County a certain Tract of Waste and ungranted Land Situate Lying and being in the county of Culpeper and Bounded as followeth Beginning at three white Oaks in Normans Line and Corner Trees to (Aaron Pinson's now) Mr. Barnes's Land & extending thence N° 42° 30' W' Ninety five Poles to a branch of Flat Run Two hund and Eighteen Poles to a Large White Oak Corner to Norman etc. \* \* \* thence with his Line N° 53° E' One hund<sup>d</sup> and Eighty Six Poles to the Beginning Containing Four Hundred Acres this Twenty Second Day of July 1749.

John Lonen }  
Edward Corder } Cha Men  
Edward Hogan } Marker  
by

Washington S C C.\*

The following is a copy from one of his more recent notebooks, and shows the improvement in his later work:—

"From the centre of the road leading to the Mill at the White gate (the course of that road being N. 74 W.) the following courses and distances were run and measured:—

"N° 74 E. 42 poles to a blazed red oak on the left of the road; thence along the new marked line.  
"N 21½ E. at 104 poles came to the first hollow;  
at 126 do. came to the second hollow;  
at 146 do. came to the cross line leading to Muddy Hole gate; and at 174 poles came to the old road leading to the Gum Spring;  
thence along that, &c."

It is a matter of record that, while Major L'Enfant is to be credited with working out the details embodied in the plans of Washington city, it was President Washington who, as consulting engineer, directed the work of L'Enfant. Washington and L'Enfant made several trips over the site of the city, and the former personally selected the location of the Capitol, of the White House and of other prominent buildings. Moreover, to him L'Enfant submitted at least two plans of the city, in which Washington made corrections. It is clear, therefore, that to the latter is due the honour of being the chief or consulting engineer of the new capital.

Washington was also a military engineer of no mean ability. In 1752 the engineer of the Ohio Company, Mr. Christopher Gist, recommended the erection of a fort at McKee's Rocks, a few miles below Pittsburg, on the east side of the Ohio. Concerning this Washington says in his diary:—

"I think it greatly inferior either for defence or advantage, especially the latter, for a fort at the forks would be equally well situated on the Ohio and have the entire command of the Monongahela."

In 1754 Washington was commissioned colonel of a Virginia regiment, with orders to cross the Allegheny Mountains and protect the men of the Ohio Company who were trading in that section and to build forts. On the outward march, and as the company was nearing the French forces, a temporary fort, known as Fort Necessity, was thrown up on a tributary of the Youghiogheny river. On his return Washington sent drafts of plans of two forts to the Governor of Virginia.

It was upon his return, in 1754, from his trip across the mountains that Washington began to ponder the great engineering problems to which he devoted the greater part of the latter years of his life. He had conceived those gigantic works for internal communication between the coast and the western country which have since been elaborated into some of the most extensive schemes of transportation by water, highway and railway that the world has ever seen, and from this time forth he investigated them in the true spirit of the civil engineer. Immediately upon his return from the trip above referred to, he reported to the Governor of Virginia in favour of a scheme of communication between the Atlantic States and the great West. The next year, while aide to General Braddock, in his disastrous campaign against the French and Indians, he retraversed much of the same route, and upon his return prepared a map, still in existence, which

\* A paper read at Mount Vernon by Herbert M. Wilson, before the convention of the American Society of Civil Engineers, and published in the *Engineering Record*.

\* For this survey Washington received the sum of 2*l.* 3*s.* on July 25, 1749, as shown by entry in his cash book, a copy of which is in the Toner Collection, Library of Congress, Washington, D.C.



shows the relations between the head-waters of the Potomac, the Monongahela, the Youghiogheny and neighbouring streams, and the portages which should be opened up to admit of water and portage transportation between the Atlantic coast and the headwaters of the Mississippi.

Washington was undoubtedly the originator and promoter of the Potomac Company, from which sprang later the Chesapeake and Ohio Canal.

It was through his efforts that the Virginia Legislature passed a Bill empowering such individuals as were so disposed to embark in the enterprise to open the Potomac, so as to render it navigable from tide-water to Wills Creek (Fort Cumberland).

Washington was not only the first to map and recommend the general route of the great highways called the National Pike and the Chesapeake and Ohio Canal, which later in truth became, to quote him, "the channels of conveyance of the extensive and valuable trade of a rising empire," but he was also the first to commend and predict the commercial success of that route through the Mohawk valley which was afterwards taken by the Erie Canal and the New York Central Railroad.

The National Pike, the route of which was practically located by him and the construction of which he planned, from the Great Falls of the Potomac to Pittsburg was, and still is, as many of you may not know, one of the best aligned, best graded and best macadamised roads in America.

"I have lately," said Washington, in a letter to the Marquis of Chastellux, "made a tour through the Lakes George and Champlain, as far as Crown Point; then returning to Schenectady I proceeded upon the Mohawk River to Fort Schuyler, crossed over to Wood Creek, which empties into the Oneida Lake, and affords the water communication with Ontario. I then traversed the country to the head of the eastern banks of the Susquehanna, and viewed the Lake Otsego, and the portage between that lake and the Mohawk River at Canajoharie. Prompted by these actual observations, I could not help taking a more contemplative and extensive view of the vast inland navigation of these United States, and could not but be struck with the immense diffusion and importance of it, and with the goodness of that Providence who has dealt His favours to us with so profuse a hand. Would to God we may have wisdom to improve them. I shall not rest contented until I have explored the western country, and traversed those lines, or a great part of them, which have given bounds to a new empire."

There is little definite record of actual construction of engineering work by Washington. There is no doubt, however, that he laid out the route and partly built a portion of the Chesapeake and Ohio Canal on the Virginia side, from the Great Falls towards Alexandria. Later the location of this canal was changed to the Maryland side, but the portion above referred to was excavated under his supervision and some locks were built upon it under his direction.

In the beginning of the autumn of 1784 General Washington made a tour as far west as Pittsburg. On returning, his first moments of leisure were devoted to the task of engaging his countrymen in a work which, though of great commercial importance, appeared to him to merit attention chiefly by reason of its political influence on the Union. In a long and interesting letter to Mr. Harrison, then Governor of Virginia, he detailed the advantages which might be derived from opening the great rivers, the Potomac and the James, as high as should be practicable. He suggested the "appointment of commissioners of integrity and abilities, exempt from the suspicion of prejudice, whose duty it should be, after an accurate examination of the James and the Potomac, to search out the nearest and best portages between those waters and the streams capable of improvement which run into the Ohio." Those streams were to be accurately surveyed, the impediments to their navigation ascertained, and their relative advantages examined. The navigable waters west of the Ohio, towards the great lakes, were also to be traced to their sources, and those which empty into the lakes to be followed to their mouths.

"I need not remark to you, sir," said Washington in his letter to the Governor of Virginia, "that the flanks and rear of the United States are possessed by other powers—and formidable ones too; nor need I press the necessity of applying the cement of interest to bind all parts of the Union together by indissoluble bonds—especially of binding that part of it which lies immediately west of us to the Middle States. For what ties, let me ask, should we have upon those people, how entirely unconnected with them shall we be? . . . Until the Spaniards (very unwisely I think) threw difficulties in their way, they looked down the Mississippi—and they looked that way for no other reason than because they could glide gently down the stream, without considering, perhaps, the fatigues of the voyage back again, and the time necessary for its performance, and because they have no other means of coming to us but by a long land transportation through unimproved roads."

To a member of the National Legislature he observed con-

cerning the same subject:—"Extend the inland navigation of the eastern waters—connect them as near as possible with those which run westward; open these to the Ohio; open also such as extend from the Ohio towards Lake Erie—and we shall not only draw the produce of the western settlers, but the peltry and fur trade of the lakes also, to our ports, thus adding an immense increase to our exports, and binding those people to us by a chain which can never be broken."

One hundred and fifteen years ago Washington asked:—"Would it not be worthy of the wisdom and attention of Congress to have the western waters well explored, the navigation of them fully ascertained and accurately laid down, and a complete and perfect map made of the country?"

Here at Arlington you may find a memorandum by Washington of the measurement of the altitude of the porch pavement above mean low tide of the Potomac River, showing the same to be 124 feet 10½ inches. Washington's compass is here, as is also the tripod which he used to support his instrument. About you are evidences of his skill as a landscape gardener.

It is thus evident that George Washington possessed unusual ability for his day as a surveyor. His maps and the records of his surveys are among the best of that time. So remarkably acute and comprehensive was his vision, it is not strange that in this pursuit he could not rest content with mere land surveying, but must pass on to exploratory surveying and to consideration of the relations existing between the drainage basins of an extent of territory greater than had probably ever before been compassed by the mind of surveyor or engineer. The brilliancy of his conceptions, the vigour with which he pressed his plans before State and national legislatures, and the fact that his plans have since been carried out in whole or in part, entitle him to rank as the first and one of the ablest of the civil engineers of America.

## THE SOCIETY OF ARTS.

THE report for the year in referring to the applied art section says six meetings were held during the session in this section. The first, on January 21, was devoted to the consideration of "The Architect's Use of Enamelled Tiles." Mr. Halsey Ricardo discussed the use of tiles both for the outside and inside of buildings, and illustrated his subject by a large number of lantern slides of buildings in Europe and in the East. He strongly urged the use of colour decoration in our streets, and classed the purposes for which tiles are used in architecture under three headings—for hygienic purposes, for saving or reflecting light, and for decoration.

The second paper, on February 4, on "The History of the Rosary in all Countries," was read by the Rev. Herbert Thurston, S.J., at a meeting over which the Cardinal-Archbishop of Westminster presided. Father Thurston traced the use of the rosary in the East to the Hindoos long before the introduction of the Buddhist religion. Paternosterers or sellers of rosaries in Paris and London are mentioned in documents of the thirteenth century, and they probably existed long before that period. All the varieties of form in rosaries are to be found in the old sepulchral brasses, and the author showed how strong an influence the general use of the rosary in the Middle Ages had upon the art of the times.

Mr. Gerald C. Horsley read a paper on March 4 on "Structural Colour Decoration of the Interior of Public Buildings," in which he alluded to the growth of colour schemes intended to accentuate the architectural lines of large buildings. The author reviewed the various attempts at colour decoration in churches and other public buildings, and pointed out that there had been a decline in the decoration of our buildings in colour since the sixteenth century. He showed that there were two distinct modes of decoration—(1) in which colour was obtained from structural materials, as shown in floors, walls and roofs, and (2) decoration in colour after the completion of the building.

At the fourth meeting, on April 8, Professor Beresford Pite read a paper on "Street Architecture," in which he pointed out the difficulties attending the adaptation of rigid architectural rules to iron structures now so common in our streets. Uniformity and symmetry were still attainable, but he feared that picturesque streets were things of the past. The modern difficulty in the treatment of street architecture was the shop window, and the chairman (Mr. Thomas G. Jackson, R.A.) agreed with Professor Pite that our commercial architecture must be frankly modern.

"The Printing and Illustration of the Modern Book" was the subject of Mr. Charles T. Jacobi's paper on May 6. The author referred to what had been done in the past towards the production of a perfect book, and from what was to be learnt from this inquiry he deduced certain principles by adherence to which we might still hope to produce beautiful books. The work of the early printers was to be studied and followed with



such adaptations as were necessary for modern requirements; thus, the best title-pages of modern times were largely adapted from early Italian examples. The three elements in the production of an artistic book were type, paper and ink. The illustrations should be in harmony with the type, but one of the artistic printer's greatest difficulties was that the paper best fitted for the type was often least fitted for adequate reproduction of half-tone prints.

The last paper of the session was read on May 27, by Miss May Morris, on "Pageantry and the Masque." In this scholarly paper Miss Morris gave a vivid picture of the pageants in the streets of London and other towns in the Middle Ages, and showed how artistically these shows were conceived and carried out, in striking contrast to the want of æsthetic fitness so manifest in much of the decoration of the present day.

### INDIAN FESTIVALS.

AN abstract of a paper on "Pageantry and the Masque," by Miss May Morris, appears in a late number of the *Journal of the Society of Arts*. It was prepared to fill the place of another paper which was to be read before the Applied Art Section of the Society. Sir George Birdwood, K.C.I.E., C.S.I., presided on the occasion, and in his speech referred to the cause, or causes, of the decay during the past 200 years of the pageantry of the streets and highways, and of our public life generally in this country. This was one of those great matters, too high for him, in which, nevertheless, he was always exercising himself; and the only conclusion on it he could advance was that the decay was attributable to the gradual failure of faith throughout Protestant countries in the sacramentality of universal nature; faith in which would seem to be the originating, continuing, and ever elevating force of the whole art of life—including its every artistic and picturesque presentation—as at once the symbol and assay of a life beyond life. At least among the historical nations who still followed in the faith of their fathers, the pageantry of popular life remained as spontaneous, real, and convincing as it was in once Catholic England. In India the people, and emphatically the Hindus, continued to live and move and have their daily being, as from antiquity, in the frankest, freest, and most familiar, and the most joyous communion with their gods; the greater gods of earth and sea and sky, and the lesser gods—imaged by roughly hewn stocks and stones—of their streets and roadsides, and the Lares and Penates of the recesses of their homes—figured by strange forms of rudely cut and beaten brass and copper: and certainly the pageantry of their common life—in which nothing was common or unclean because all was divine—shapes and colours, and fills the complete diurnal and annual round of the dædal globe whereon they tread. Every morning at sunrise the women are to be seen in their long flowing robes of white, or pink, scarlet, black, blue, yellow, or green, perambulating in archaic Aryan worship the four horned altar on which the pot of "Holy Basil" is placed in front of every Hindu house, invoking the blessing of the Almighty on the House Father and Mother, and their Sacred Family. The fields, and villages, and towns, are periodically perambulated in the same way; and thus the whole world of India is, at times, to be seen out in the dewy sunshine of the dawn walking with God.\* Again every evening as the fiery orb of the sun sets silently below the unclouded horizon it is solemnly saluted; when, in the sudden night which follows, the temples are all brilliantly lighted up and visited in turn by the thronging crowd.† Then there are the great festivals of the gods for every month, and almost every week, of the year. The festival of the Winter Solstice is held in Bombay [early in January], in honour of the ancient Vedic gods, Indra [the Rain], Varuna [the Waters], Agni [Fire: cp. "ignis"], and Surya [the Sun]. The moment the sun enters the sign of Aquarius, all the people go down into the sea, and rub their bodies over with sesamum

seed, the favourite seed of the sun, for the pure, bright light it oil gives; whence the phrase, "Open Sesame." The rest of the day is spent in out of door and indoor rejoicings; and wherever friends meet they offer each other comfits of sesamum seed, saying, "Take, eat these comfits of sesamum seed, and think kindly of me throughout the coming year." At the celebration of the Hindu New Year's Day [March 21], the standard of Indra is set up in front of every [Hindu] house in Bombay. It must be set up before every house, for, on this day, it is raised in honour of Indra on the inestimable height of higher heaven; and the will of the gods is to be done on earth even as in heaven. So on this day the standard of Indra waves in every wind under the firmament, over all India; and at night in Southern India, his bonfires blaze on every hill. But the Holi festival [early in March], held in honour of Krishna, is the great saturnalia of the spring equinox in India, and the greatest popular pageant of Western India. In the surging tide of the processions which traverse every street of Bombay the whole life of Krishna is enacted, and particularly his sports with the shepherdesses [*gopis*], the mingled crowd of devotees as they tumultuously advance singing hymeneal songs and throwing red powder [*gulal*], and flowers, and sweetmeats, and squirting coloured and scented water at each other, and the images of the god borne aloft among them. At the close of the festival bonfires are lighted, into which the Holi cake is thrown as a burnt-offering. Much fun also goes on in making people "April—or rather March—fools." The Summer Solstice is celebrated all over India [end of June], but in Bombay the rejoicings are of rather a domestic than public character, on account of the heavy rains at the setting in of the south-west monsoon. The annual procession [about the middle of September] of Ganapati or Gan-esa [literally "Lord of the Hosts (gangs of heaven) the god of Wisdom"], presents in Bombay and Poona a scene of unbounded mirthfulness. Every house contributes an image of the god to the procession, in which every member of every family joins. The images of the god are each carried in a palanquin, profusely hung with the choicest flowers of the season, the god himself also being crowned with roses. With loud shoutings and laughter the gigantic procession makes for the sea, or for some tank, where the images are thrown into the water, in which the god is supposed to pass the night; and that night no one may look the moon in the face. The Dasara [last week of October] is the great Indian festival of the autumnal equinox. In Bengal it is held in honour of the dread goddess Kali or Durga, the wife of Siva, the God of Destruction; and the great nocturnal procession of the goddess, with its interminable blaze of torches and coloured [Bengal] lights, blue, red, and green, and incessant detonation and deflagration of fireworks, and its wildly whirling crowd of leaping and yelling men, holding up over the heads the mystic vase containing the conjoined symbols—crossed triangles, and lotus "Knop and flower"—of Kali and Siva, and of dancing and singing women—waltzing round and round and in and out the uproarious onrushing turmoil, and singing as they waltz in robes of the brightest motley—the procession from end to end lit up luridly against the blackness of darkness of the night, in which the high tottering images of the goddess are partially lost; all this presents a seething spectacle of frenzied religious enthusiasm, indescribable in its impression of weird and phantasmal picturesqueness. In Bombay, the solemnity is characteristically kept as a great military pageant, in honour of the tremendous war, sung of in the "Mahabharata," between the heroic Pandavas and their cousins the equally heroic Kauravas. From every rural village to the town the higher and lower hereditary officials, and the whole body of the cultivators, issue forth in great gala, and perambulate the bounds of the township, or village, and worship the trees, defining them, particularly trees of such rich and showy effluence as the *Butea frondosa* [*palas*, whence Plassey], *Cassia fistula* [*bawa*], *Prosopis spicigera* [*shami*], and *Bauhinia racemosa* [*apti*]. In the "native states," the Hindu princes and chiefs ride forth on their painted horses,\* in the full gorgeous panoply of Mediaeval war—like to

The great Emetrius, the King of Inde—

with flags flying, and blare of trumpets, crash of shawms, and piercing notes of high shrilling pipes, and the measured bang of a well belaboured big drum; and, with their whole court arrayed in the richest apparel of state—robes, turbans, and fluttering scarfs of yellow, edged green, and every tinct of red edged yellow, and white edged red, and black, white and blue, dull orange [*bhagwa*], the caparisons of the same colours as these edgings, and overlaid with gold plates and studs, richly embossed, and resplendent with talismanic gems; and garlanded with flowers, as are also the musical instruments and the tall spears, and the flags. And so the gay cavalcade rides on and on into the green wild, to some full blooming

\* This perambulation [*pra-dakshina*, "advancing—with face to the sun—right-hand-wise"—compare Deisul] in the direction of the sun's course from east by south, and west, and north, round to east again, the most ancient rite of Aryan sun worship, survives to this day in the service of the sacring of our English sovereigns. In anointing the sovereign, the Cruciate or Western order of enumerating the four quarters of the heavens is observed, *i.e.*, the forehead and breast, and then the left and right arm, are in succession touched with the anointing balm; but in the previous presentation of the sovereign to the people, the archbishop, in reciting the terms of "Recognition," observes the Circular or Eastern order of the four quarters of the heavens, addressing the assembled company successively toward the east, south, west, and north. It is to be observed also that the "Colobium Sindonis" with which the sovereign is after unction invested, originally meant a "tunic of Indian [Sindian] stuff," *i.e.* cotton—not linen, as now.

† These simple rites recall the "Hymnus ad Gallicantum" and the "Hymnus ad Incensum Lucernæ" of the primitive Christian families. [Prudentius.]

\* They are stained on their manes, and tails, and legs below the knee—the milk-white horses red, the black white or yellow, the green, and so on.



Butea,\* or Cassia, or Prosopis, or Bauhinia, that has before-hand been marked out as its cynosure and goal; and perambulating it 7 times or 9, or 12, 19, 21, 84, or 108 times, gathers its golden flowers in armsfull, calling them "gold" [*sona*], and offering, them on the return journey, as "gold" to the idols of the wayside village temples. Going and returning, wherever these gallant companies ride, the good Lord Sivaji, in their vision, rides on before—just as St. George once rode before our English chivalry—Sivaji, the partisan leader of the Mahratta race against the suzerain Mogul, and the idolised personification of their impassioned patriotism and romantic valour. Such is the Dasera of Western India, and in all the instinctive, spontaneous ritualism of Hindu life this solennial pageant of the Mahratta Princes is

—the master dream, of a life of dream  
And the faith of a flower's beauty.

The Divali, or great Feast of "Lanterns" [about second week in November] held in Bengal in honour of Kali in her more beneficent aspect, is in Bombay again characteristically celebrated in honour of the joyous Lakshmi, the Goddess of Good Luck, or Good Fortune, the wife of the Lord Preserver Vishnu. Every house in the town and island is traced out with "rows of lamps" of cocoa-nut oil, which gives a soft, pure flame of the most perfect and far-reaching illumination, irradiating the whole town of Bombay, and the whole length of the Island of Bombay from Mahim to Colaba, in an illimitable light of the most ethereal splendour, reflected far out into the Erythrean Sea. The eyes that once gaze on its glory remain under its enchantment for ever. The great Mahometan religious solemnity of the "most holy" Muharam, held in perpetual memorial of the massacre of the sons of Ali, Sir George Birdwood said he had described in detail in Sir Lewis Pelly's "Introduction to the translation of The Miracle Play of Hassan and Hussain" [Allen & Co.], and he would refer those present who wished to follow the matter further to Sir Lewis Pelly's obscure but profoundly suggestive volumes. He had said enough to show that the popular life of India was in this way everywhere filled with divinity; and that was the only explanation he could suggest of its universal artistic attractiveness, and of the complete content of the people in it—which neither wars, nor plague, nor famines could perturb or confuse. He had found it very much the same in Catholic Europe. He spent the year of the Great War of Giants in France, and was living in Boulogne at the time of the death and burial of Monseigneur Hafrangue, when the apple orchards around about were in their full bloom. Many present would know Boulogne, the new town flush with "the streak of silver sea," and the old town above, still high cinctured by its Mediæval wall, and the old apple trees planted on the ramparts, with the cathedral church of Our Lady of Boulogne brooding over all. About three hours before the interment half a mile or more of sable cloth, from 4 to 5 yards broad, and diapered over with large ivory-white *fleurs de lys*, was rolled out from the cathedral stores, and hung above the shop and other ground-floor windows, along the length of every street to be traversed by the funeral procession. This was all on foot—the ordinary clergy in black and white, a small knot of church dignitaries in robes, and nodding hat tufts, of various colours, and a few civil and military functionaries in official uniforms. Nothing could have been more unprepared, yet nothing more real and impressive in its simple, and—alike in picture and in sentiment—most expressive pomp. With that cloud of apple blossoms, in all their lavish loveliness, enwreathing the whole scene, it was as if an illumination out of some old Froissart had been suddenly reproduced in the landscape and life and religious feeling of 600 years ago. Here, in answer to a question from the audience, Sir George Birdwood said they might make sure of the spectacular success of the Coronation Durbar at Delhi. The present Viceroy was a statesman of artistic sensibility, and quick, instinctive sympathy with everything in the vernacular culture of the people of India that had contributed to develop their unique historical personality, and being also a man of powerful intellect, with the disposition to do

things magnificently, and wielding autocratic power, he might be relied on to make the approaching Durbar altogether worthy of them and of the traditions they cherished of the glories of the reigns of Vikramaditya and Salivahana. Continuing his remarks, the Chairman said that one of the circumstances of his life he always recalled with pride was his having occupied that chair when, in 1892, the illustrious father of Miss May Morris read his paper before the Applied Art Section on "The Woodcuts of Gothic Books." The Great Exhibition of 1851 inflicted two cruel blows on our prosperity and reputation; it betrayed our manufacturing processes and our commercial organisations—in a phrase, our "trade secrets"—to the whole world of ravaging competitors, whose envy, hatred, and malice has ever since dogged our footsteps in all our international relations; and it also cosmopolitanised and so degraded and deformed our national industrial arts. The great work of William Morris was to lead back our arts and crafts to their traditional methods, and "motifs," and style; and he happily lived to influence by his direct teaching and example almost every department of our decorative arts—painted tiles, stained glass, furniture of all uses, woven and dyed and printed stuffs, embroidery, domestic metalwork, and book printing, book illustration, and bookbinding, and now at last our jewellery is beginning to feel something of his indirect influence—once again proving that death has no power over those whose work is deathless. It was, indeed, by the death of William Morris that the true purpose and dimensions of his lifework were first made manifest to us, and he is now recognised throughout the civilised world as the greatest art master of the Victorian Age, who stamped his glorious personality on every English craft and household art of the nineteenth century.

#### HAWICK ARCHÆOLOGICAL SOCIETY.

THE annual field day of this Society was held on the 12th inst., when about forty of the members and others had an excursion to Lauder and other places of historic interest in the neighbourhood. Proceeding by train to Melrose, they drove to Lauder *via* Glendearg Castle, which is associated with "The Monastery," one of Sir Walter Scott's novels. There are three forts in close proximity, and these were occupied by the defenders of the monks of Melrose in olden times. The old parish church of Lauder, which is a pre-Reformation one and cruciform in shape, was visited, also Thirlstone Castle, the seat of the Earl of Lauderdale. This castle is of great size and strength, part of it having been built by Edward I. early in the fourteenth century, and some of the rooms contain family portraits and other very valuable pictures by Lely, Hogarth, Romney, Sir Joshua Reynolds and other old masters. Thirlstone Castle, being near the Border, was in ancient times very often in the hands of the English. In one of the rooms Prince Charlie slept after the battle of Prestonpans. Unfortunately the weather on Saturday afternoon was showery, and the party had to forego a portion of their programme.

#### BIRMINGHAM ARCHÆOLOGICAL SOCIETY.

ON Saturday a party of members and friends of this Society visited three of the most interesting churches in Warwickshire—Knowle, Temple Balsall and Berkswell. The fine church at Knowle is, outwardly at least, familiar to most Birmingham people, though a much smaller number would be acquainted with its interior. This may be described as a study in church extension. Originally designed as an ordinary parish church, the foundation of a chantry caused the addition of a side chapel, which has now become a transept. The church was afterwards made collegiate, with the result that the chancel had to be much lengthened. The original elevation of the chancel must have been much greater than now, since the sedilia and piscina, which remain, are at an impossible height above the present pavement. Perhaps the greatest ornament of the church is the beautiful rood-screen, though this, like the church itself, has suffered materially from restoration. The visitors next drove to Temple Balsall. This very beautiful thirteenth-century church derives its name from the Knights Templars, who built it, but did not long retain possession. It is remarkable for its simplicity as well as for its architectural charm, consisting as it does of one single finely-proportioned space, without any division whatever. Being built on rapidly-rising ground, the body of the church ascends to the chancel by a series of progressive elevations. The Geometrical windows are among the best of their kind known, and the whole edifice is surmounted on the outside by a very singular frieze of human and grotesque heads, full of character and most original in design. Beside the church stands what was once the grange, with perhaps the refectory of the order. Outwardly this is so changed that no one would date it earlier than the eighteenth century, but within it retains some fine evidences of its actual antiquity.

\* All these trees flower in the spring, but one or other of them, if it be only a solitary example, is always to be found conspicuously in flower also in the autumn. While revising the proof of these remarks I note in the *Pall Mall Gazette* of this afternoon [June 17] that the townfolk of the Royal Burgh of Linlithgow are this very day summoned to the ceremony of marking the bounds of the town in the following traditional terms:—"Oyez! Oyez! Oyez! The burgesses, craftsmen, and whole inhabitants of the Royal Burgh of Linlithgow are hereby warned and summoned to attend my Lord Provost, Bailies, and Council at the ringing of the bells on Tuesday, June 17 curt., for the purpose of riding the town's marches and liberties according to the use and custom of this ancient and honourable burgh royal, and that in their best carriage and equipage, apparel, and array, and also to attend all diets of Court held and appointed upon that day by my Lord Provost and Bailies, and that under the penalty of 100*l.* Scots each. God save the King and my Lord Provost." The italics are mine.—Geo. B.



The almshouses, which also adjoin the church, were erected and endowed by Lady Catherine Leveson, and present an ideal picture of a peaceful retreat for age and infirmity. A drive by country by-roads brought the party to Berkswell, where, after tea, the fine church was carefully inspected. This is of various ages from the twelfth to the seventeenth century, and has the advantage of having been restored with care and reverence. The Norman windows in the east end, and the curious and grotesque corbel heads on the south side, are striking features. There is also a Norman crypt, once probably a place of pilgrimage, and reached by a stair, which seems to intimate the expectation that those who visited the holy place would have prepared themselves by fasting. This crypt was for some time a place of burial, and still contains some half-dozen coffins, with their occupants, a somewhat grim spectacle to the pilgrims of the present day, whose objects are mainly of an architectural nature. Happily the crypt is excellently ventilated. Some of the old galleries remain, and the vestry over the half-timbered porch is delightfully quaint. In visiting all three churches the party had the able guidance of Mr. J. A. Cossins, by whom every detail of their construction was furnished.

### THE CARDMAKERS' COMPANY.

THE prizes offered by the Cardmakers' Company for the best designs for a pack of cards have been awarded as follows:—First prize, 10 guineas, Mr. H. W. Hardy, 17 Featherstone Buildings, Holborn; second prize, 5 guineas, Mr. MacCoteron, 36 Great James Street, Bedford Row; third prize, 3 guineas, Miss Margaret Roscoe, Box Hedge, Great Budworth, Northwich, Cheshire; fourth prize, 2 guineas, Mr. Fred W. Walenn, The Studio, 15<sup>1</sup>/<sub>2</sub> Avenue Road, St. John's Wood; commended, Mr. Cosmo Crump, 324 Upper Street, Islington; Mr. Fred Leighton, 122 Upper Tulse Hill; Mr. W. H. Riley, Waverley, Dashwood Street, Leicester; Mr. F. Colin Tilney, Unaleigh, Green Lanes, Winchmore Hill; and Mr. W. McBride, 17 Pembroke Road, Dublin. There were 230 entries. Mr. Hardy's card shows the figure of Peace with the olive branch, while the clouds in the background are rolling away. On one side of the figure is the coat of arms of the City of London, and on the other the arms of the Cardmakers' Company appear. This card will be reproduced and presented at the Master's and Wardens' inauguration dinner.

### GENERAL.

**The Enlargement** of Victoria station by the London, Brighton and South Coast Railway is to be commenced forthwith.

**Professor Halsey C. Ives**, the chief of the department of art at the Universal Exposition, St. Louis, 1904, has arrived in London.

**A Memorial** is to be erected in Peterborough Cathedral to the soldiers of all ranks from the neighbourhood who have fallen in the South African war. Leicestershire, Rutland, Cambridgeshire and Lincolnshire will be asked to co-operate with Northamptonshire in the matter.

**Excavations** for the foundation of a new railway station at Metz have just brought to light the remains of a Roman theatre 438 feet long.

**Mr. John Thomas Bellows**, of Upton Knoll, and of Eastgate Street, Gloucester, printer and publisher, and a prominent archaeologist, who died on May 5, aged seventy-one, bequeathed his collection of antiquities to the Gloucester Museum.

**A Sanatorium** is likely to be erected by the South Wales and Monmouthshire Branch of the National Association for the Prevention of Consumption to accommodate twenty patients. The building will cost 5,000*l.*, and the maintenance will be 1,600*l.* per annum.

**An Exhibition** showing how design is taught in Japan, and especially in Tokio, has been organised in Paris by M. Felix Regamey. Examples from elementary classes, as well as from the higher art classes, are shown. They suggest that in the schools at least tradition has more power than nature.

**The People** of Lancaster have decided to re-erect the ancient Covell Cross on the site of the old Roman basilica as a memorial of King Edward's Coronation and a thank-offering for his recovery. An influential committee has been appointed to carry out the scheme. The site is opposite to the present Judges' apartments.

**The Villa Borghese** in Rome was to be sold to-day. But a guarantee has been given in the name of the Italian Government and the municipality of Rome that the property will be purchased for public purposes. This has been decided on in order to prevent foreigners obtaining possession of the villa.

The King of Italy will contribute a large sum towards the fund.

**The Reservoir** at Upper Neuadd, which has a capacity of 350,000,000 gallons of water and a water surface of 59 acres, has been opened. The cost has been 138,000*l.*, and is the last of three constructed for the Merthyr Waterworks. A solid masonry embankment stretches across the valley, and is surmounted in the centre by a prominent tower containing the balancing tank for hydraulic purposes. It has been almost wholly built out of Welsh materials. The masonry was constructed with Welsh stone and Welsh lime, and no cement from England or abroad had been needed. The consulting engineer was Mr. G. F. Deacon.

**The "Danae"** of M. Carolus Duran is to be acquired by the Municipal Council of Bordeaux in spite of the protestations of some of the members. The price to be paid is 12,000 francs.

**Lord Cheylesmore** has bequeathed his collection of English mezzotint portraits, which numbers several thousands, to the nation. They will shortly be deposited in the British Museum. Among the works is an example by Prince Rupert.

**Operations** are in progress for the protection of the spire of Salisbury Cathedral against lightning. The former conductors will be removed, and a more modern system of continuous copper tapes substituted.

**Vauxhall Bridge** is not progressing so quickly as had been anticipated. It will not be possible to enter into a contract for the superstructure before next year. The delay might to some extent be attributed to natural and other difficulties which had presented themselves. Not the least of these had been the rather stringent restrictions imposed by the Thames Conservancy in their efforts to secure non-interference with the traffic of the river. From time to time the contractors had been urged to press forward the work under their contract for the demolition of the old and the partial construction of the new bridge, but they had stated that they would be unable to finish before the end of this year.

**The First Commissioner of Works** has stated that he was ready to make arrangements by which a moderate sum might be yearly appropriated to the redecoration, or completion of the decoration, of the Palace of Westminster on a more systematic basis than had hitherto been the case.

**Stoppages of Sewers** by roots of trees made it necessary to relay over 19,500 feet of pipes in the system at Berlin in 1900. The joints are now made with oakum and asphalt in order to avoid such trouble on new lines.

**The Melbourne and Metropolitan Board of Works** have accepted a recommendation of the Officers' and Servants' Committee to the effect that the wages of bricklayers employed by the Board should be reduced from 11*s.* per day per week of forty-eight hours to 10*s.* per day.

**The Portland Cement Industry** in the United States in 1901 is reported by the United States Geological Survey to have turned out a little over 12,710,000 barrels, an increase of about 4,230,000 barrels over the product of 1900. The imports during 1901 were under 940,000 barrels. The production of natural cement in 1901 was about 7,850,000 barrels, and the output of slag cement was about 273,000 barrels.

**An International Exhibition** is proposed to be held next year in Manchester. It will comprise the world's latest inventions in machinery, scientific research, aerial navigation, education, photography, agriculture, mining and other industries, and the fine arts. The promotion is in the hands of exhibition experts, and already plans and designs have been drawn out. If the scheme develops as planned the larger portion of the profits will be handed over to the local charities, and more especially to the hospitals.

**The First Section** of the contract for constructing a new dock at Chatham has been practically completed. The dock is built of concrete faced with granite and Portland stone. The length of the groundwork is 712 feet, the length from the outside of the caisson to the head being 650 feet. It is expected that the new dock will be completed and ready for use at the beginning of the new financial year.

**We are requested** to state that the appointment of Mr. Hornblower as architect to University College Hospital, recently announced in the architectural journals, is not connected with the completion of the new buildings now in course of erection from the design of Mr. Alfred Waterhouse, R.A. On the retirement of Mr. Waterhouse in April last, Mr. Paul Waterhouse was appointed by resolution of the hospital committee to carry these important buildings through to their completion, a selection which was confirmed by Sir J. Blundell Maple, Bart, M.P., the donor of the entire fabric.

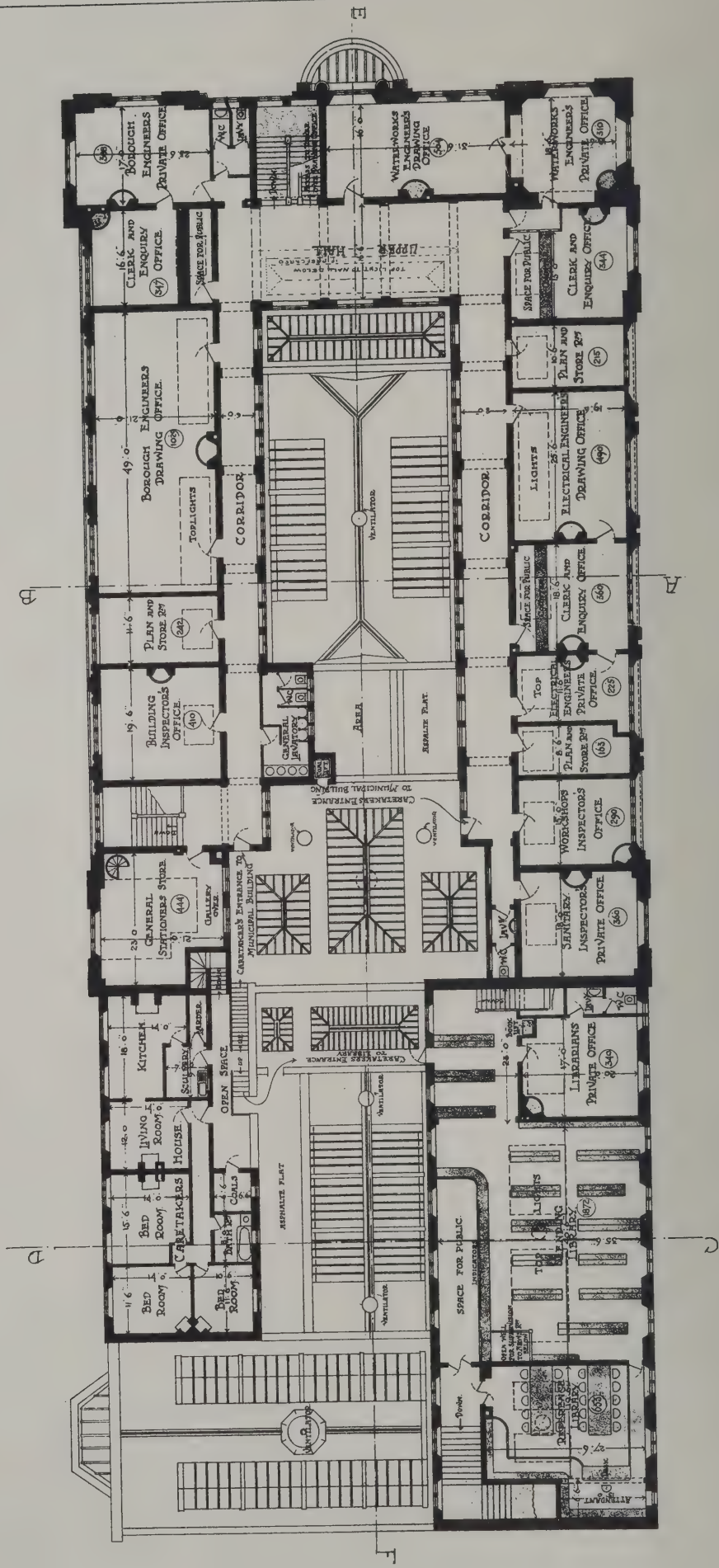
**The Wesleyan** general chapel committee has sanctioned the erection of twelve new chapels, at an estimated cost of 56,000*l.*, with accommodation for 5,300. One is at King's Road, Chelsea, and another at Finchley. The expenditure sanctioned by the committee during the year is 626,000*l.*



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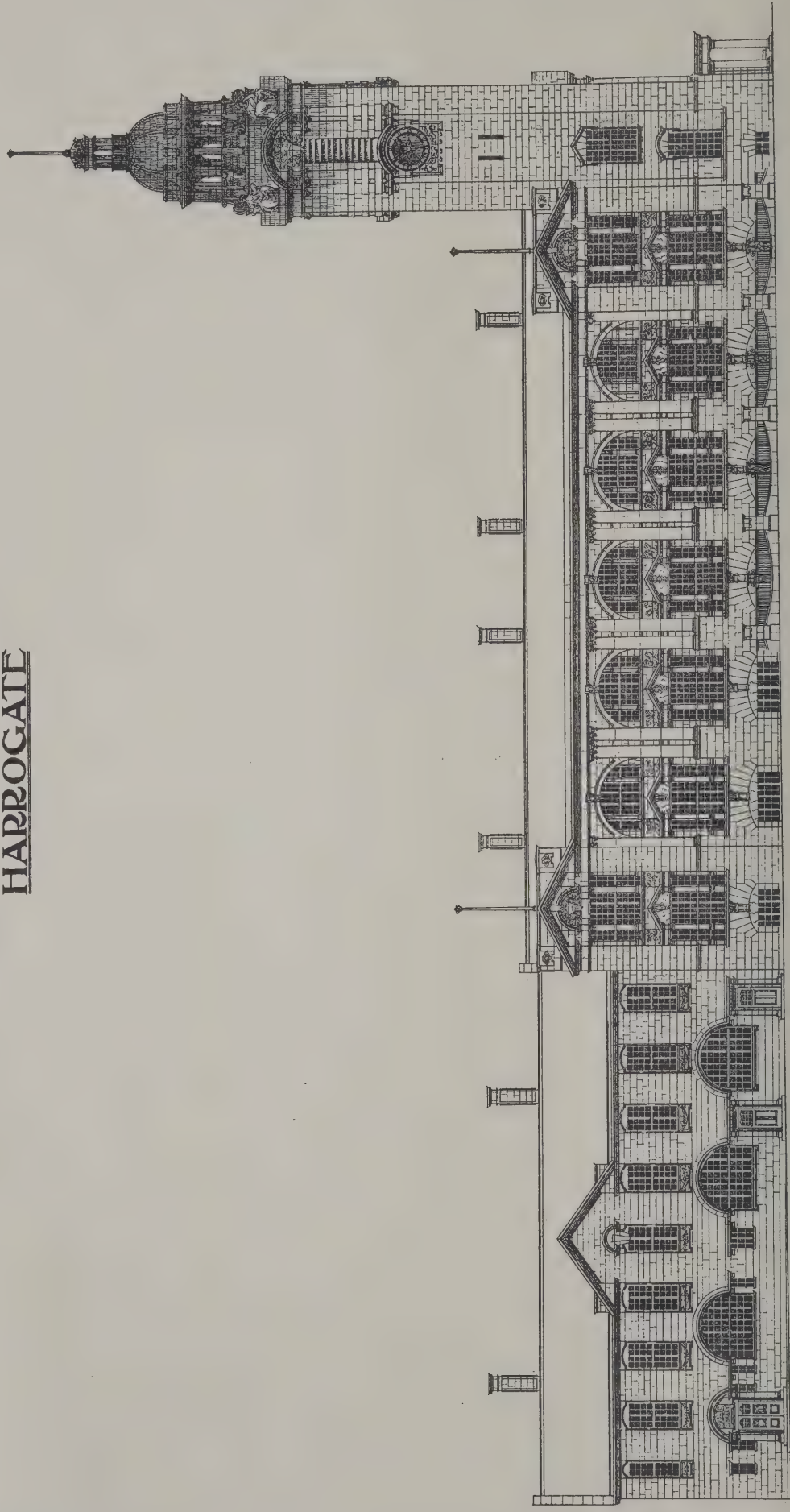




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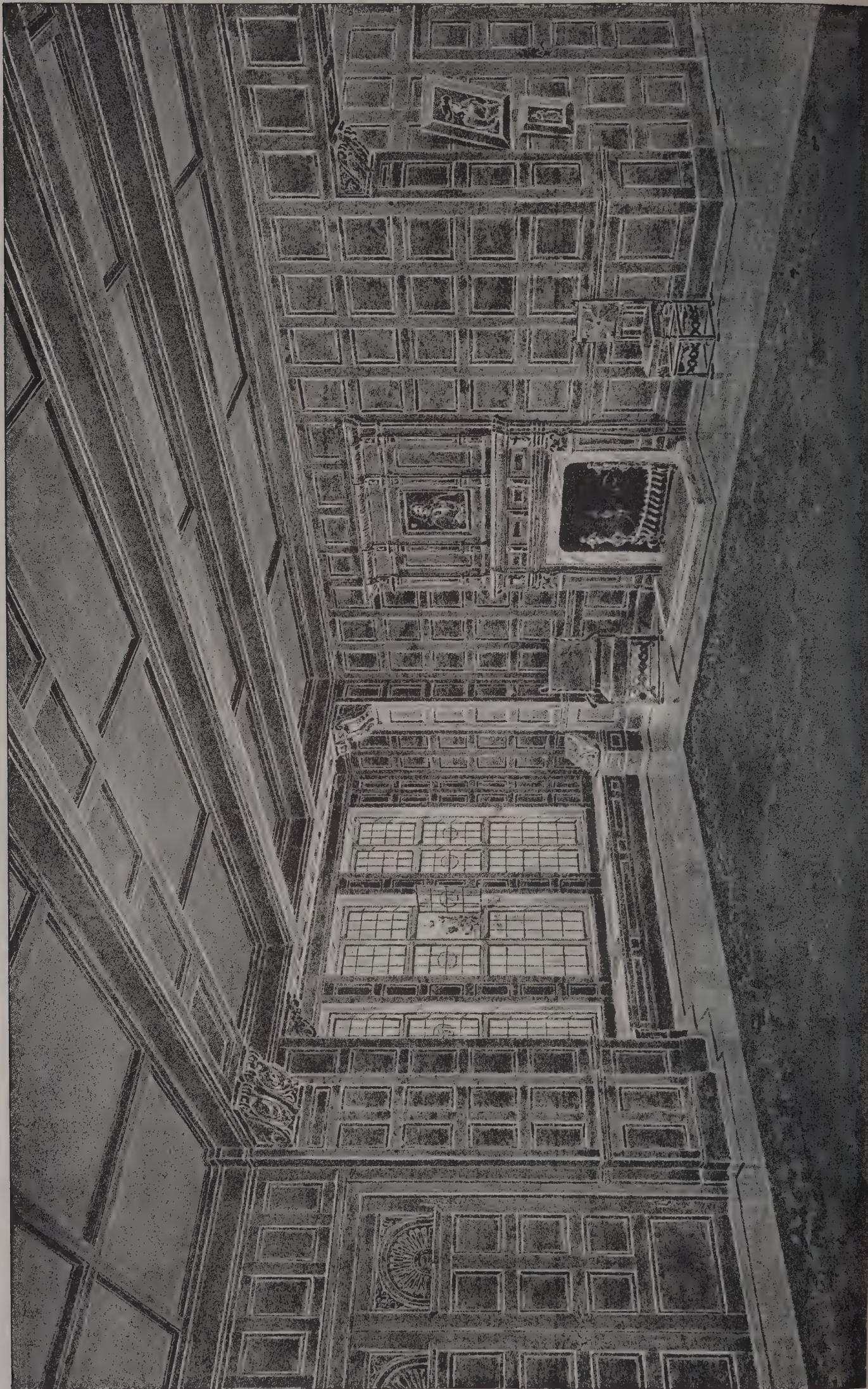
ELEVATION TO VICTORIA AVENUE



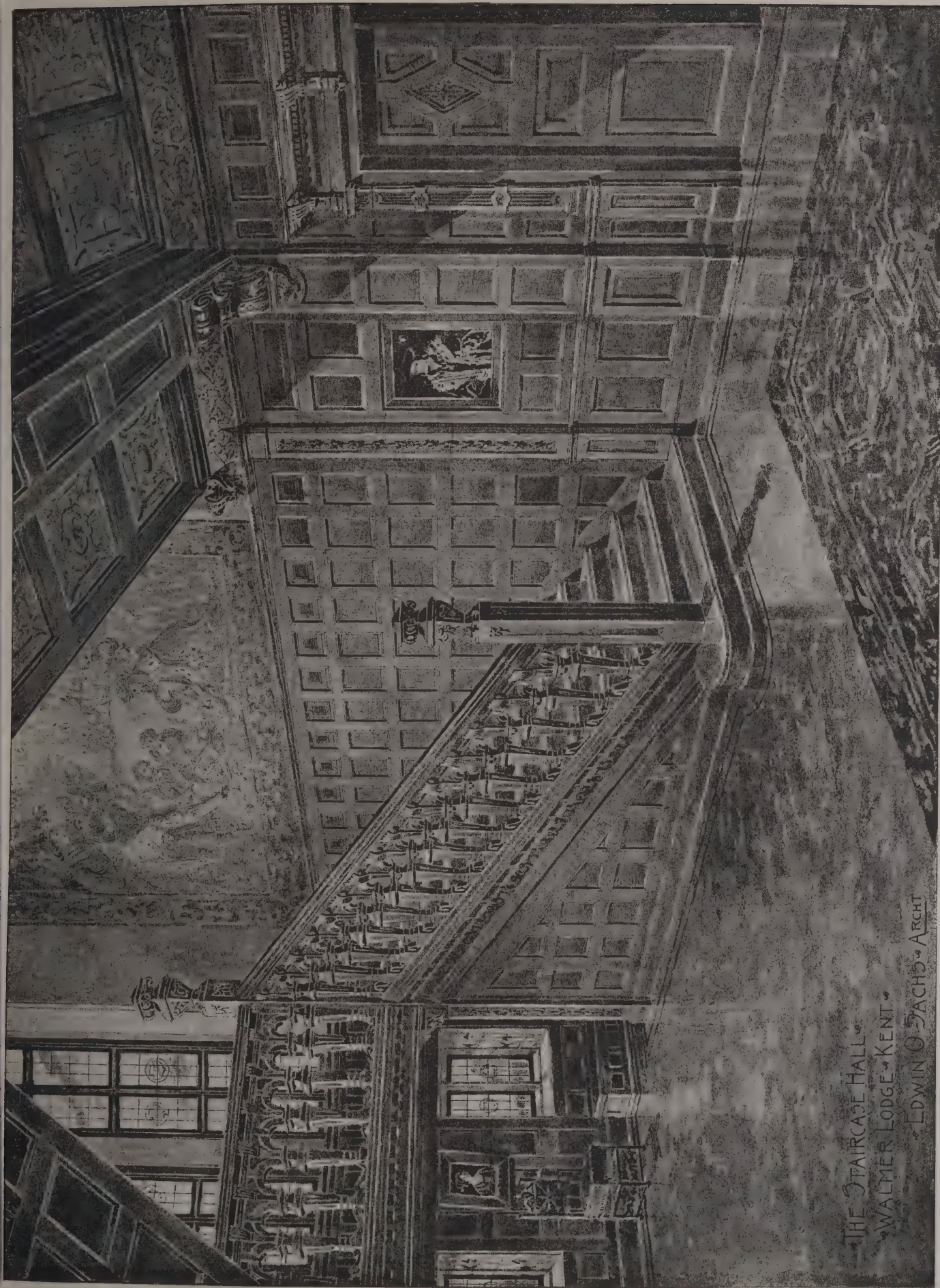


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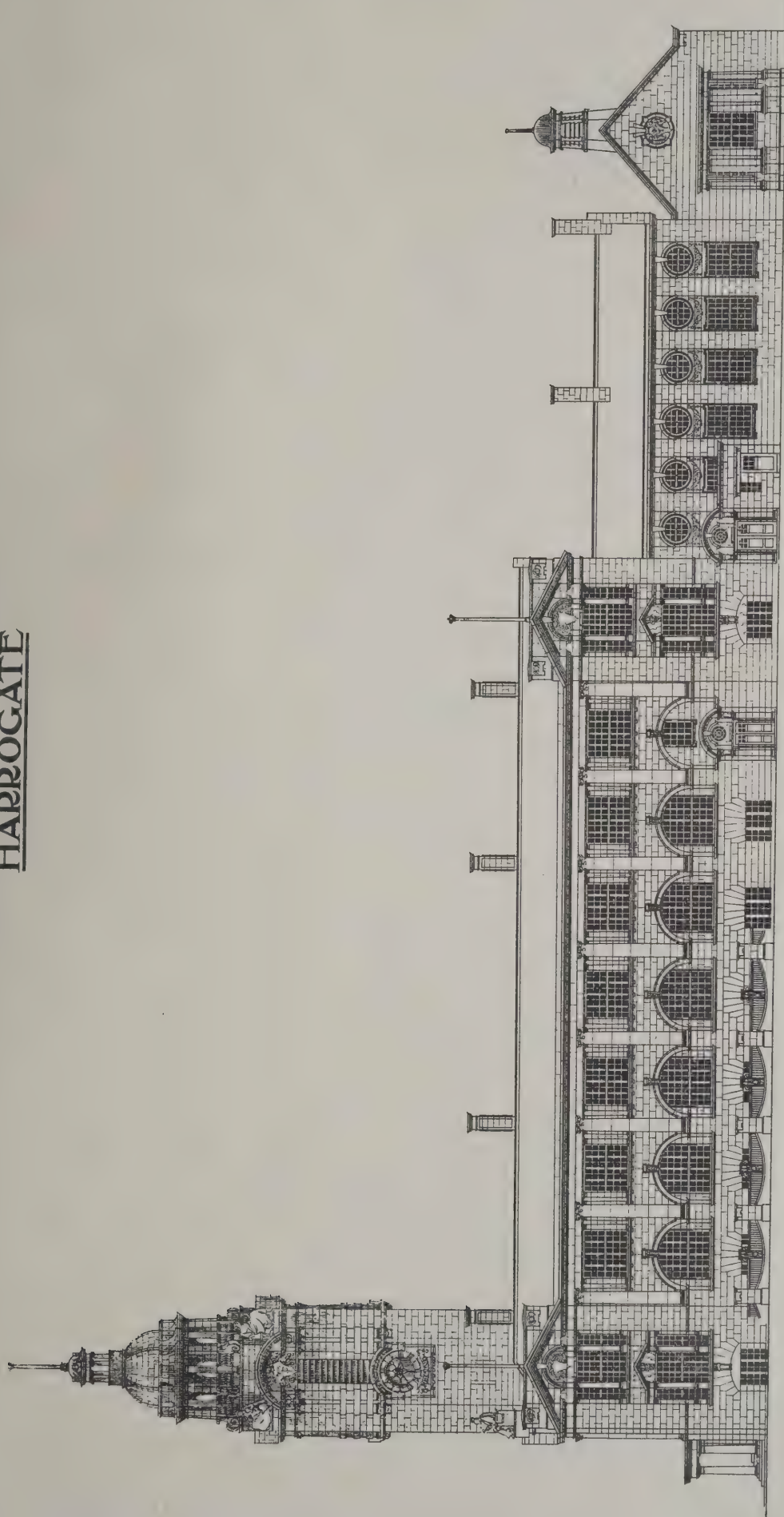
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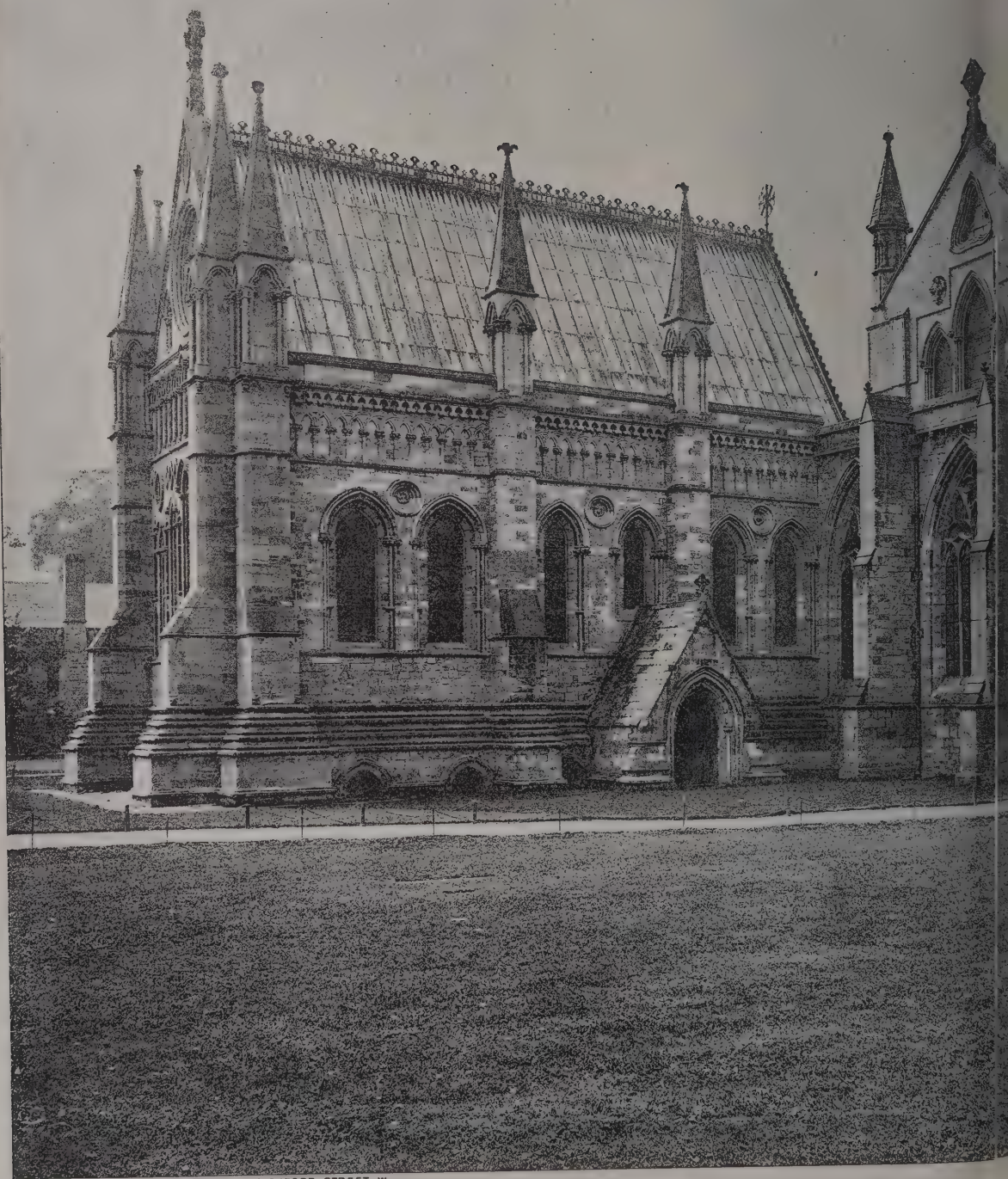


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THE  
Architect and Contract Reporter.

## EDITORIAL NOTICES.

*In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

## TENDERS, ETC.

*\*\* As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

## COMPETITIONS OPEN.

**BERMONDSEY.**—Sept. 16.—Designs are invited for artisans dwellings to be erected on land at Rotherhithe, within the borough of Bermondsey, and known as the Fulford Street area. Premiums of 100*l.*, 60*l.* and 40*l.* will be awarded. Mr. Fredk. Ryall, town clerk, Town Hall, Spa Road, S.E.

**BIDEFORD.**—Sept. 25.—The Town Council of Bideford are about to erect municipal offices and a public library upon a site opposite the west end of the Long Bridge, Bideford, and they invite designs for the proposed buildings. Premiums of 30*l.*, 15*l.* and 10*l.* respectively are offered for the designs which shall be placed by the Council first, second and third in order of merit. Designs and descriptions, &c., are to be delivered to Mr. Wm. B. Seldon, town clerk, 18 The Quay, Bideford.

**CLACTON-ON-SEA.**—July 26.—Plans are invited for erection of a new school in Holland Road, Great Clacton, for 500 children, showing enlargement for an extra 300 children. Mr. Charles E. White, clerk, Wellesley Road, Clacton-on-Sea.

**DEPTFORD.**—Aug. 30.—Competitive designs are invited for a town hall and municipal offices. Premiums of 100*l.*, 75*l.* and 50*l.* are offered for the three selected designs. Mr. Vivian Orchard, town clerk, Municipal Offices, 20 Tanner's Hill, Deptford S.E.

**INDIA.**—Nov. 1.—Competitive designs are invited for the erection of a memorial to Her Majesty the late Queen Victoria at Allahabad. A premium of 2,000 rupees will be awarded to the design selected by the committee. Mr. H. Nelson Wright, Indian Civil Service, honorary secretary, Queen Victoria Memorial Fund Committee, Allahabad, India.

**LIVERPOOL.**—Sept. 15.—Designs are invited for new labourers' dwellings to accommodate about 2,500 persons, to be erected on the Hornby Street area. Premiums of 250*l.*, 150*l.* and 100*l.* respectively are offered for the first three selected designs. Particulars will be supplied by the Town Clerk.

**SOUTHEND.**—Sept. 7.—Designs are invited for a church to accommodate 500 persons, a clergy-house, and a parochial hall or parish-room about 50 feet by 30 feet. Mr. C. H. J. Talmage, Kathleen Villa, Southchurch Road, Southend-on-Sea.

**SUNDERLAND.**—Aug. 30.—Designs are invited for proposed police and fire-brigade buildings to be erected in Gill Bridge Avenue and Dun Cow Street. Premiums of 100*l.*, 50*l.* and 25*l.* are offered for first, second and third designs respectively. Mr. Fras. M. Bowey, town clerk, Town Hall, Sunderland.

## CONTRACTS OPEN.

**ALDERSHOT.**—July 23.—For erection of stables, cartsheds and other buildings in connection with the new depôt. Mr. Nelson F. Dennis, surveyor, Aldershot.

**AMBLE.**—July 25.—For erection of twenty-one workmen's houses at Amble, Northumberland. Messrs. Thomas Meik & Sons, engineers, 29 St. Andrew's Square, Edinburgh.

**BARNSELY.**—July 21.—For alterations to the fire-brigade station, near St. Mary's Place, Barnsley, and for erection of six new shop fronts to shops in the Harvey Institute. Mr. J. H. Taylor, borough surveyor, Manor House, Barnsley.

**BARROW-IN-FURNESS.**—July 23.—For erection of additional battery-rooms, &c., at the electricity works, Buccleuch Street. Mr. C. F. Preston, town clerk, Town Hall, Barrow-in-Furness.

**BENWELL.**—July 25.—For erection of eighteen houses in Colston Street, Benwell, Northumberland. Messrs. Farthing & Dunn, 21 Pilgrim Street, Newcastle.

**BEVERLEY.**—For erection of two houses at Beverley. Mr. Fredk. Musto, architect, Greek Street Chambers, Leeds.

**BRADFORD.**—July 24.—For erection of a furniture depository, Picton Street, Manningham. Mr. Charles E. Marsden, architect, 3 John Street, Bradford.

**BRADFORD.**—July 30.—For erection of laundry, boiler-house and chimney, stabling, &c., in Barnard Terrace, Usher Street, Bradford. Mr. Wm. Rycroft, architect, Bank Buildings, Manchester Road, Bradford.

**BRADFORD.**—Aug. 6.—For erection of a store and three houses in Great Horton Road and Summerville Road, Bradford. Mr. Wm. Rycroft, architect, Bank Buildings, Manchester Road, Bradford.

**BRIDPORT.**—July 21.—For alterations and additions to the Greyhound hotel, Bridport, Dorset. Mr. Frederick Cooper, architect, Bridport.

**BRISTOL.**—July 28.—For erection of a cemetery chapel at Canford Lane, Westbury-on-Trym. Messrs. La Trobe & Weston, architects, 20 Clare Street, Bristol.

**BRISTOL.**—July 28.—For extensions to the Ham Green hospital, Pill, Bristol, comprising two pavilions, discharging block, additions to administration building, &c. Mr. T. H. Yabbicom, city engineer, 63 Queen Square, Bristol.

**BROUGHTON MOOR.**—July 22.—For erection of Broughton Moor Church, Cumberland. Mr. W. D. Caröe, architect, 8 Whitehall Place, S.W.

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**BURY.**—July 24.—For alterations and additions to the manager's house at the sewage-disposal works at Blackford Bridge. Mr. Arthur W. Bradley, borough surveyor, Bury, Lancs.

**CAMBORNE.**—July 22.—For erection of a villa residence. Mr. E. H. Crispin, Trelawney Road, Camborne.

**CANNOCK.**—July 22.—For erection of an infants' school for 210 children, with caretaker's house, out-offices and boundary walling in Station Road, Hednesford, Cannock, Staffs. Messrs. Bailey & McConnal, architects, Bridge Street, Walsall.

**CARLISLE.**—Aug. 1.—For erection of grand stands, &c., for the Carlisle Race Stand Company, Ltd. Mr. Joseph Graham, architect, Bank Street, Carlisle.

**CASTLEFORD.**—July 24.—For repair of the market hall roof, Castleford. Mr. H. H. Broadbent, clerk, Council Offices, Castleford.

**CHESTERFIELD.**—Aug. 9.—For construction of a new main outfall sewer at Cresswell, for the Clown Rural District Council. The works will comprise about  $1\frac{1}{2}$  miles of 12-inch stoneware pipe sewers, together with all manholes, ventilators, flushing arrangements and other appurtenances. Mr. James Snow Whall, clerk, 44 Bridge Street, Worksop.

**CHESTERFIELD.**—Aug. 11.—For erection of infirmary, nurses' home, laundry and other works at the workhouse, Newbold Road, Chesterfield. Messrs. Rollinson & Son, architects, 13 Corporation Street, Chesterfield.

**COVENTRY.**—July 21.—For conversion of the old mill at the workhouse into dayrooms and dormitory. Mr. Thos. F. Tickner, architect, 7 Bishop Street, Coventry.

**COVENTRY.**—July 21.—For repairs and alterations to premises, Gosford Street, Coventry. Mr. Herbert W. Chataway, architect, Trinity Churchyard, Coventry.

**CROSSGATES.**—July 30.—For erection of station buildings, platform roofing, warehouse, stationmaster's house and cottages at Crossgates, Yorks, for the North-Eastern Railway Company. Mr. William Bell, architect, York.

**CUMBERLAND.**—July 25.—For erection of proposed gymnasium at Seascale. Mr. W. L. Mason, architect, Kelsick Road, Ambleside.

**DARLINGTON.**—July 31.—For erection of seventy workmen's houses in connection with Messrs. R. Stephenson & Co.'s works, Darlington. Mr. W. Y. Dixon, Estate Office, Baltic Chambers, West Hartlepool.

**DEWSBURY.**—July 23.—For erection of two stables in South Street. Messrs. John Kirk & Sons, architects, Huddersfield.

**DURHAM.**—July 24.—For making of a cellar underneath part of the Workmen's Club, Parker's Buildings, West Stanley. Specifications, &c., may be seen at the Club.

**EASTBOURNE.**—July 22.—For erection of proposed park-keeper's lodge and refreshment buildings at Hampden Park. Mr. Wm. Chapman Field, borough architect, Town Hall, Eastbourne.

**ELLAND.**—July 25.—For erection of a refuse destructor and electric light and power station. Mr. James Clarkson, clerk, Council Offices, Elland.

**FINCHLEY.**—July 21.—For erection of an electricity generating station. Mr. Edward Calvert, chief electrical engineer, 2 Broadway, Finchley.

**GOLCAR.**—July 23.—For erection of a house and shop at Town End, Golcar, Yorks. Mr. Arthur Shaw, architect, Golcar.

**GREAT YARMOUTH.**—July 21.—For erection of a boundary wall at the Hollies, Gorleston. Mr. Walter Lake, architect, Regent Street, Great Yarmouth.

**HASTINGS.**—July 22.—For alterations and additions to the storekeeper's cottage at Waterworks Road, Hastings. Mr. P. H. Palmer, engineer, Town Hall, Hastings.

**HASTINGS.**—July 23.—For completion of subway between the new workhouse buildings and the present workhouse infirmary, Ore, Hastings. Mr. A. W. Jeffery, architect, 5 Havelock Road, Hastings.

**HIGH WYCOMBE.**—July 23.—For erection of thirty-six cottages in Kitchener Road, High Wycombe. Mr. A. E. Boulter, secretary to G.W. and G.C. Railways Joint Committee, Paddington Station, London.

**HUDDERSFIELD.**—July 21.—For erection of two semi-detached residences at Banks, Honley. Mr. J. Berry, architect, 3 Market Place, Huddersfield.

**HUDDERSFIELD.**—July 25.—For erection of a villa residence at the Quarries, Longwood Edge. Mr. J. Berry, architect, 3 Market Place, Huddersfield.

**IRELAND.**—July 21.—For completion of the tower and spire to the Catholic church, Templemore, co. Tipperary. Mr. C. G. Ashlin, architect, 7 Dawson Street, Dublin.

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IRELAND.—July 21.—For an extension of the present goods shed on the west side of York Dock, for the Belfast Harbour Commissioners. Mr. W. A. Currie, secretary, Harbour Office, Belfast.

IRELAND.—July 23.—For construction of a storage reservoir at Barnattin, near Drogheda, with a capacity of about 60,000,000 gallons, for the Drogheda Corporation. Mr. L. Donegan, secretary, Gas and Water Offices, Drogheda.

IRELAND.—July 23.—For erection of twenty labourers' cottages, out-offices, &c., and the alterations and repairs of one existing cottage, at Charleville, Cork. Mr. J. Ryan, clerk, Rural District Council, Charleville.

IRELAND.—July 23.—For erection of an altar, with credence table and sacarium, for new chapel in the workhouse at Loughlinstown. Mr. P. F. Comber, 19 Lower Leeson Street, Dublin.

IRELAND.—July 24.—For erection of a schoolhouse at Tooban, Fahan, Londonderry. Mr. J. P. M'Grath, architect, 28 Carlisle Road, Londonderry.

IRELAND.—July 24.—For erection of a central creamery building of stone or iron at Lear, Bailieborough. Mr. Owen Clarke, secretary, Co-operative Agricultural and Dairy Society, Ltd., Bailieborough.

IRELAND.—July 24.—For erection of a central creamery building of stone or iron at Lear, Bailieborough. Mr. T. M. Farrelly, Bailieborough.

IRELAND.—July 25.—For alterations in connection with Kilbride Presbyterian church. Rev. R. Allison, The Manse, Kilbride, Doagh.

IRELAND.—July 25.—For erection of twenty-one labourers' cottages, with offices, &c., in the rural district of Celbridge. Mr. James Whelan, architect, 4 Lindsay Terrace, Botanic Road, Dublin.

KEIGHLEY.—For erection of three houses in Arctic Street, Beechcliffe, Keighley. Messrs. John Haggas & Sons, architects, North Street, Keighley.

KINGSTON-UPON-THAMES.—July 21.—For erection of a new free library in Fairfield Road. Mr. J. Alfred Cox, architect, 4 Adam Street, Adelphi, W.C.

KINGSWEAR.—July 22.—For erection of a vestry, &c., at the Wesleyan chapel, Kingswear. Mr. G. H. Mitchelmore, architect, Waterhead, Kingswear.

LEEDS.—July 21.—For erection of underground conveniences at Kirkgate Market, Leeds. One guinea deposit with application. City Engineer's Office, Leeds.

LEEDS.—July 22.—For erection of a cottage at the Sheepscar gasholder station. Mr. R. H. Townsley, general manager, Gas Offices, Leeds.

LEEDS.—July 23.—For erection of the Foresters' Club institute in Enfield Road, Leeds. Messrs. Buttery & Birds, architects, Basinghall Hall Square, Leeds.

LEEDS.—July 29.—For erection of a Primitive Methodist church and schools, &c., in Harehills Avenue, Leeds. Mr. W. H. Dinsley, architect, Chorley, Lancashire.

LEICESTER.—July 21.—For erection of an infirmary at North Evington, Leicester. Messrs. Giles, Gough & Trollope, architects, 28 Craven Street, Charing Cross, S.W.

LEIGH.—July 24.—For construction of underground convenience in the market place, Leigh, Lancs. Mr. Tom Hunter, borough engineer and surveyor, Bank Chambers, Leigh.

LICHFIELD.—July 22.—For erection of stabling and alterations required to the existing premises at the Stowe Street depot (late Wait's Yard), and alterations to Minors House property. Mr. Emerson Brooke, city surveyor, Frog Lane, Lichfield, Staffs.

LEWES.—July 23.—For erection of board-room and offices in West Street, Lewes. Mr. Henry Card, architect, 10 North Street, Lewes.

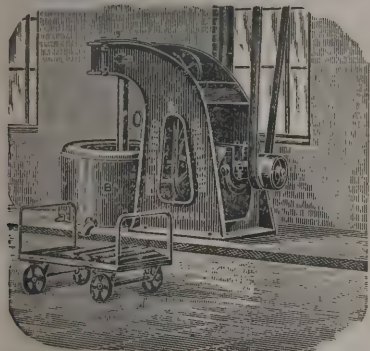
LONDON.—July 22.—For foundations for the proposed new Land Registry offices, Lincoln's Inn Fields, for the Commissioners of H.M. Works and Public Buildings. Particulars may be obtained on application to Mr. Henry Tanner at H.M. Office of Works, Storey's Gate, S.W.

LONDON.—July 24.—For erection of lunatic wards at the workhouse, Parish Street, Tooley Street, S.E. Messrs. Newman & Newman, architects, 31 Tooley Street, S.E.

LONDON.—July 24.—For internal and external decorative repairs at the infirmary, East Dulwich Grove, S.E. Mr. G. D. Stevenson, architect, 13 and 14 King Street, E.C.

LOWESTOFT.—For removal of the present wooden clubhouse of the Royal Norfolk and Suffolk Yacht Club to a site about 50 feet to the north of that now occupied. Apply to the Secretary, Royal Norfolk and Suffolk Club, Lowestoft.

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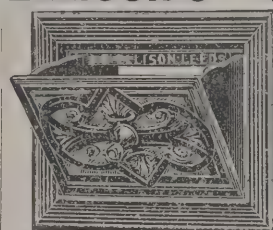
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**LUTON.**—July 21.—For erection of two galleries in the Chapel Street Infant school; alteration and extension of latrines in the Chapel Street boys' yard; painting and other renovation, both external and internal; painting (external), the pointing of brickwork and other renovations at the Biscot school. Messrs. J. R. Brown & Son, architects, Castle Street, Luton.

**MANCHESTER.**—July 22.—For widening of L. and Y. Railway line at Brighthouse. Contract No. 3. Particulars at Engineer's Office, Hunt's Bank, Manchester.

**NEWARK.**—For street works in Coronation Road, Newark. Messrs. Sheppard & Harrison, architects, Bargate, Newark.

**NEWARK.**—July 22.—For erection of an infant school accommodating 300 children on a site adjoining the Great North Road, Balderton. Messrs. Saunders & Saunders, architects, Arcade Chambers, Newark-on-Trent.

**NEWCASTLE-ON-TYNE.**—July 23.—For alterations to Hanover Square brewery and maltings, Newcastle-on-Tyne. Mr. J. W. Wardle, architect, 33 King Street, South Shields.

**NEWCASTLE-ON-TYNE.**—July 23.—For erection of buildings in City Road and Manor Chare, for the Hospital for Sick Children. Messrs. Oliver, Leeson & Wood, architects, Bank Chambers, Mosley Street, Newcastle-on-Tyne.

**NEWHAVEN.**—July 30.—For general repairs and internal painting and decorating at the workhouse, Newhaven, Sussex. Mr. William Gates, clerk to the Guardians, 86 High Street, Lewes.

**ROCHDALE.**—July 30.—For erection of a reservoir keeper's house at Ashworth Moor, Norden, near Rochdale. Mr. James Diggle, Hind Hill Street, Heywood.

**RUGBY.**—July 28.—For pulling-down the wooden building used as a small-pox hospital at Barby Road pumping station, and re-erecting it on a brick foundation in a field at Lawford Heath. Mr. D. G. Macdonald, surveyor, Rugby.

**SCOTLAND.**—For additions to the St. Cuthbert's R.C. schools, Slateford Road, Edinburgh. Messrs. Buchanan & Bennett, C.E., 12 Hill Street, Edinburgh.

**SCOTLAND.**—July 22.—For erection of a public slaughter-house. Mr. Gavin Paterson, architect, Hamilton.

**SCOTLAND.**—July 24.—For completion of the new post office, Aberdeen. Forward names and addresses to H.M. Office of Works, Edinburgh.

**SCOTLAND.**—July 31.—For extension of Glasgow Central Station hotel for the Caledonian Railway Company. Mr. James Miller, architect, 15 Blythswood Square, Glasgow.

**SOUTHAMPTON.**—July 31.—For erection of a telegraph office at Southampton Docks, for the Commissioners of H.M. Works and Public Buildings. Particulars may be obtained at H.M. Office of Works, &c., Storey's Gate, S.W.

**SOWERBY BRIDGE.**—July 28.—For erection and alteration of the proposed offices at the gasworks, Sowerby Bridge, Yorks. Mr. R. W. Evans, clerk to the U. D. Council, Commercial Bank Chambers, Halifax.

**STAVELEY.**—For erection of a club at Staveley, Chesterfield. Mr. Ben. J. Marson, architect, Staveley, Chesterfield.

**THORPE HESLEY.**—For erection of house and shop, also slaughter-house and stable, at Thorpe Hesley, Yorks. Mr. Herbert Smith, architect, Wentworth, near Rotherham.

**THORPE HESLEY.**—For erection of house and shop and two cottages at Thorpe Hesley, Yorks. Mr. Herbert Smith, architect, Wentworth, near Rotherham.

**TOTTENHAM.**—Aug. 5.—For erection of a fire station, dépôt buildings, &c., at Conway Road. Mr. W. H. Prescott, engineer, Coombes Croft House, 712 High Road, Tottenham.

**WALES.**—For erection of forty-one houses at Six Bells, Abertillery. Mr. Telford Evans, 8 Queen Street, Cardiff.

**WALES.**—For erection of a new shop and premises, Beaufort Street, Brynmawr. Mr. B. J. Francis, architect, Abergavenny.

**WALES.**—July 21.—For alterations and additions to the Prince Albert inn, Albert Street, Aberdare. Messrs. J. Llewellyn Smith & Davies, architects, Aberdare.

**WALES.**—July 21.—For erection of stables and stores at Abertillery and Llanhilleth. Mr. James McBean, surveyor, 1 King Street, Abertillery.

**WALES.**—July 21.—For erection of twelve cottages at Brithdir. Mr. E. A. Johnson, architect, Merthyr.

**WALES.**—July 21.—For renovation of the Bethel church, Upper Cwmbran. Mr. T. Williams, secretary.

**WALES.**—July 21.—For erection of a house at Little Mill, Pontypool. Mr. D. J. Lougher, architect and surveyor, Bank Chambers, Pontypool.

**WALES.**—July 21.—For alterations to the Tabernacle schoolroom, The Hayes, Cardiff. Messrs. Robert & Sidney Williams, architects, Borough Chambers, Wharton Street, Cardiff.

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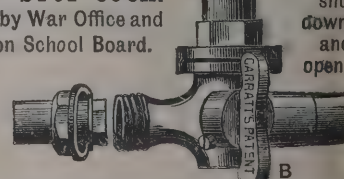
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WALES.—July 24.—For erection of a boiler and engine house at the Joint Counties asylum, Carmarthen. Particulars on application to the Clerk to the Asylum.

WALES.—July 24.—For alteration of Penrhiwceiber girls' school cloakroom, erection of boundary walls, and general repairs. Mr. S. Shipton, clerk, Town Hall, Mountain Ash.

WALES.—July 25.—For reroofing, colouring the inside walls and cleaning and varnishing the seats of Nantyglo parish church. The Vicar, Trinity Vicarage, Brynmawr.

WALES.—July 25.—For erection of sixty houses at Senghenydd. Mr. J. H. Phillips, architect, Clive Chambers, Windsor Place, Cardiff.

WALES.—July 30.—For extension of schools at Gilfach Goch, Llantrisant. Mr. Jacob Rees, architect, Pentre, Rhondda.

WALES.—July 31.—For erection of a chancel and vestry at the church of Trianglas, Trecastle, Breconshire. Mr. D. T. Isaac, Ruperra House, Brecon.

WALTHAMSTOW.—July 22.—For erection of a gas-house at the electric generating station, Priory Avenue, Walthamstow. Mr. E. J. Gowen, clerk, Town Hall, Walthamstow.

WILLESDEN.—July 22.—For erection of observation block in connection with the extension of isolation hospital at Dog Lane, Neasden. Mr. O. Claude Robson, engineer, Public Offices, Dyne Road, Kilburn, N.W.

WOLVERHAMPTON.—July 28.—For erection of covered market on the site adjoining the cold stores and ice factory in Wulfruna Street. Particulars may be obtained on application at the Borough Engineer's Temporary Office, School Street Depot.

WORKINGTON.—July 22.—For erection and completion of eighteen dwelling-houses in Blackburn Street. Mr. John Warick, town clerk, Town Hall, Workington.

WORKSOP.—July 25.—For erection of four semi-detached villas at Sunnyside, Worksop. Mr. A. H. Richardson, architect, Victoria Buildings, Worksop.

ON Saturday afternoon the new parish church of Carnoustie, N.B., was formally opened by the Rev. Dr. Russell, Moderator of the Church of Scotland General Assembly. The new church is a handsome structure and has cost about 7,000l. There is sitting accommodation for 1,100 persons.

## TENDERS.

### BOLDRON.

For construction of works for the water supply of the village of Boldron, near Barnard Castle. Mr. J. E. PARKER, engineer, Post Office Chambers, Newcastle-on-Tyne.

H. Smith	£557	3	10
R. A. Crowe	463	2	5
C. Hedley	453	2	0
H. & J. W. Lee	367	2	3
C. Busby & Sons	365	3	0
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### CARLTON.

For sewerage works in Meadow Road, Carlton, Notts. Mr. R. WHITBREAD, surveyor.

Cope & Raynor	£321	0	0
Richmond & Son	260	4	6
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### CHELMSFORD.

For making, delivery, erecting, setting to work and maintaining for six months a borehole pump at the waterworks pumping station, Great Baddow, near Chelmsford. Mr. JAMES DEWHIRST, engineer, Avenue Chambers, Chelmsford.

A. Barclay & Co.	£540	0	0
Glenfield & Kennedy	515	0	0
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ing Work. All communications to  
587 & 589 HARROW ROAD, PADDINGTON, W.



**COLCHESTER.**

For plumbing and sanitary work at the Canterbury Road school. Messrs. GOODEY & CRESSALL, architects, Victoria Chambers, Colchester.

W. Rogers	£690	0	0
J. H. Johnson	690	0	0
E. Pattison & Son	585	13	0
G. DOBSON & CO., Colchester (accepted)	539	0	0

**EXETER.**

For erection of a new roof (about 60 feet by 48 feet) over a portion of the Old Quay Foundry and Engine Works, Commercial Road. Mr. J. ARCHIBALD LUCAS, architect, Guildhall Chambers, High Street, Exeter.

WESTCOTT, AUSTIN & WHITE, Summerland Crescent (accepted)	£130	0	0
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**HAMMERSMITH.**

For painting, whitewashing, &c., at the infirmary, St. Dunstan's Road, W.

S. T. Prechner	£230	0	0
Bristow & Eatwell	201	0	0
H. J. Turnpenny	193	0	0
E. McGinnis	190	18	6
Dixon & Page	190	0	0
Matthews & Wallis	185	0	0
C. Curd & Son	175	10	0
A. E. Townsend & Coles	165	7	9
W. Reason	149	10	0
A. M. Smith	145	10	0
Bate Bros.	145	0	0
J. Martin	142	12	0
B. Young	138	5	0
F. E. Wright	129	0	0
H. Dakin & Co.	128	0	0
C. H. Maisey & Sons	127	10	0
Seed Bros. & Crook	120	0	0
E. B. Smith	119	0	0
A. H. Brewer	118	10	0
E. Stubbington & Co.	112	0	0
R. Iredale & Sons	109	0	0
Woollaston Bros.	98	0	0
P. McCarthy	91	0	0
M. McArthur	72	10	0
J. J. RICHARDS, 9 Shannon Grove, Brixton, S.W. (accepted)	66	0	0

**HALIFAX.**

For erection of an auxiliary summer service of steam-heating mains at the poor-law hospital, Salterhebble.

J. NAYLOR & SON, Cheapside (accepted).

**HANDSWORTH.**

For painting outside wood and ironwork at the Victoria Park, Handsworth, Staffs. Mr. H. RICHARDSON, surveyor.

F. Nicholls & Co.	£691	0	0
Hulbert & Ladbury	498	0	0
A. BRYANT, Soho Road, Handsworth (accepted)	330	16	0

**HERNE.**

For (1) cleansing, repainting and general repairs of the isolation hospital wards and offices at West End, Herne, Kent; (2) for laying about 580 feet of 4-inch and 160 feet of 6-inch stoneware pipes, the building of inspection chambers, fixing of gullies, ventilation shafts and the building of cesspools for the drainage of the West End isolation hospital. Mr. W. D. STATHAM, surveyor, Eddington, near Canterbury.

**Contract No. 1.**

Dennis	£268	0	0
C. W. Welby	186	0	0
Keeler & Co.	179	16	0
Wiver & Co.	164	18	0
P. Furley	136	0	0
Smellie	125	0	0
F. W. Gates	116	10	2
CHURCH & CO, High Street, Whitstable (accepted)	95	3	0

**Contract No. 2.**

T. Collard	108	10	0
C. W. Welby	100	0	0
Keeler & Co.	196	15	0
Smellie	115	0	0
F. W. Gates	87	16	6
P. FURLEY (accepted)	79	0	0

**HOVE.**

For street works in Wolstonbury Road. Mr. H. H. SCOTT, borough surveyor.

W. A. MCKELLAR, 1 Langdale Road (accepted) £357 0 0

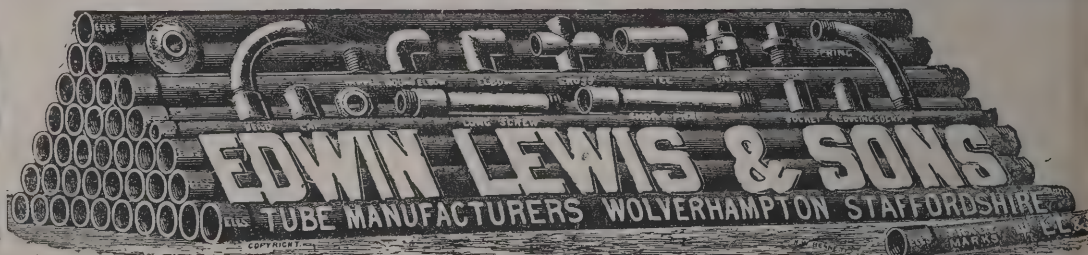
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HOUNSLOW.

For sewerage works on the Pear Tree estate. Mr. P. G. PARKMAN, surveyor.

Wheeler	£1,069	0	0
Lawrence & Thacker	1,065	0	0
Dunmore	1,057	0	0
Dickson	1,031	0	0
Rogers	935	0	0
Mowlem	916	0	0
Parry	903	0	0
Ketley	901	0	0
Swaker	869	0	0
Green	820	0	0
Chapman	729	0	0
CASE SEA DEFENCE SYNDICATE, LTD., London (accepted)	697	0	0

ILFORD.

For erection of an oak paled fence 6 feet high, with gates, at the new recreation-ground adjoining Wanstead Park. BOWLAND BROS., Steam Sawmills, Fenny Stratford, Bletchley (accepted)

	£348	2	10
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ILKLEY.

For additions and alterations to Westfield, Ilkley. Messrs. FRANCE, MILNES & FRANCE, architects, 99 Swan Arcade, Bradford.

Accepted tenders.

Gill & Pease, mason and joiner.

J. Houldsworth, plumber.

Nelson Bros., slater.

D. Lister, plasterer.

J. Schofield, Burley-in-Wharfedale, painter.

IRELAND.

For erection of two labourers' cottages in the townland of Dromore, Stranorlar. C. BROWNE, Glenelly, Killygordon (accepted)

	£245	0	0
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For sewerage works in Herbert Road, Bray.

W. Murphy	£480	0	0
B. Brady & Sons	465	0	0
Heggarty & Gault	379	10	0
G. DIXON, 55 Upper George Street, Kingstown (accepted)	367	10	0

IRELAND—continued.

For sewerage works in the village of Clashmore, co. Waterford. Mr. EDWIN GREEN, engineer, Killeagh, co. Cork. M. MURRAY & SONS, Youghal (accepted)

	£340	0	0
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KETTERING.

For street and sewerage work in Reservoir Road, Britannia Road, Beatrice Road, and parts of Shakespeare Road and Hallwood Road, and for sewerage works in Cowper Street and the road from Cowper Street to the Rockingham Road. Mr. T. R. SMITH, surveyor.

T. C. Starkey	£5,290	0	11
A. Lewin & Son	3,600	0	0
Co-operative Builders, Ltd.	3,487	0	0
A. Jewel	3,295	0	0
W. G. Wilmot	3,002	0	0
F. BARLOW, Rothwell (accepted)	2,910	0	0

LEICESTER.

For cleaning and painting the whole of the exterior of the old portion of the borough lunatic asylum, Humberstone, and other structures and erections in connection therewith. Mr. E. GEORGE MAWBEY, borough surveyor.

G. Johnson & Sons	£480	0	0
W. A. Banton	478	4	2
J. T. Warner	450	18	3
W. Clark	447	4	5
J. A. Tyler	427	15	3
T. Carr	402	0	0
T. C. KING & Co. (accepted)	326	5	0

LONDON SCHOOL BOARD.

For alterations and repairs to adapt No. 37 Kentish Town Road for a workshop and store for own workmen for the Marylebone District and for a clerk of works' office.

H. Wall & Co.	£225	0	0
F. T. Chinchin & Co.	217	0	0
Marchant & Hirst	198	0	0
T. Cruwys	170	0	0
H. Eady	169	0	0
F. Chidley	166	0	0
Stevens Bros*	154	10	0

\* Recommended for acceptance.

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Overhead Tanks, Gas  
Engines or Accumu-  
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Station, Ayr Station  
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Glasgow; Court  
Houses, Glasgow,  
&c., &c.

**JOHN BENNIE,**  
HYDRAULIC & GENERAL ENGINEER,  
Star Engine Works,  
Moncur St., GLASGOW.

# HEATING



HEATING AND VENTILATING  
ENGINEERS,  
CROWN WORKS,  
LEEDS.



## LONDON SCHOOL BOARD—continued.

For improvements, Boundary Lane school.

Holliday & Greenwood, Ltd.	£16,131	0	0
J. Garrett & Son	16,026	0	0
F. & H. F. Higgs	16,021	0	0
W. Downs	15,673	0	0
J. & M. Patrick	15,620	0	0
Treasure & Son	15,588	0	0
J. Marsland & Sons	15,575	0	0
J. Appleby	15,276	0	0
J. & C. Bowyer	14,778	0	0
J. Smith & Sons, Ltd.	14,673	0	0
Stimpson & Co.	14,440	0	0
W. Johnson & Co., Ltd.	14,427	0	0
T. L. Green *	14,287	0	0

For sliding glazed partition to divide classroom B (all departments), including a new doorway to one of the divided rooms (infants' department), Plassy Road school.

H. Bouneau	£430	0	0
H. Groves	387	0	0
H. Leney & Son	373	10	0
G. Kemp	364	0	0
G. Bush	360	0	0
J. & C. Bowyer	356	0	0
J. Smith & Sons, Ltd.	342	0	0
A. J. Acworth	330	0	0
RICE & SON (accepted)	319	0	0

For alterations and repairs to adapt premises adjoining the Hatfield Street school for a workshop and store for own workmen for the Southwark district and for a clerk of works' office.

H. J. Williams	£507	10	0
J. Marsland & Sons	298	0	0
J. Harries & Co.	281	10	0
Belcher & Co., Ltd.*	257	0	0

\* Recommended for acceptance.

For cleaning, painting and repairing Nos. 31 and 33 Albion Street, South Grove.

T. Willson	£276	10	0
J. F. Holliday	229	0	0
W. Margrie & Son	213	0	0
J. Haydon & Sons	184	10	0
A. HEARD & CO. (accepted)	173	0	0

## LONDON SCHOOL BOARD—continued.

For removing existing partition and providing two new partitions in order to redivide classrooms D and E into three rooms, including reversing stepped flooring in these rooms in order to obtain left light; also altering position of doorway in connection with same, Brackenbury Road school.

S. Polden	£336	0	0
H. Bouneau	313	12	0
General Builders, Ltd.	267	0	0
Galbraith Bros.	257	0	0
John Stones	253	8	0
Lathey Bros.	251	0	0
F. T. Chinchon & Co.	243	15	0
W. R. & A. Hide	235	0	0
WAKE & DEAN, LTD. (accepted)	214	0	0

For providing a glazed partition to divide classroom D; also reversing stepped flooring in one of the divided rooms in order to obtain left light, including lengthening two windows and bricking up fireplace in connection with same, girls' department, Redvers Street school; and for providing a glazed partition to divide the corresponding room in this department, together with reversing stepped flooring in both rooms, including widening three windows, forming new doorway and bricking up fireplace in connection with same, infants' department, Redvers Street school.

Johnson & Co.	£620	0	0
J. Grover & Son	488	0	0
F. & F. J. Wood	480	0	0
BRUCE, CROOM & CO. (accepted)	462	10	0

## MACCLESFIELD.

For inside and outside painting and decorating required at the mortuary chapels and lodges at the cemetery.

BENNETT BROS, John Street (accepted).

## NORTH WALSHAM.

For supply of 300 tons of granite, broken to a 1½-inch ring gauge, and 25 tons of granite chips. Mr. E. J. SIMPSON, surveyor.

W. GRIMLEY & Co., Sutton Bridge, 300 tons of 1½-inch, 13s. 5d.; 25 tons of chips (Mountsorrel granite), 10s. (accepted).  
Note.—Ten other tenders.Prevents Dry Rot,  
Fungus, Decay, &c.

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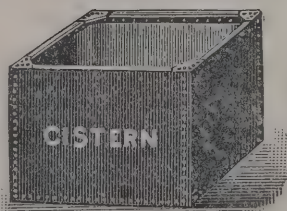
Wood Preservative.

Enquiries  
Solicited.

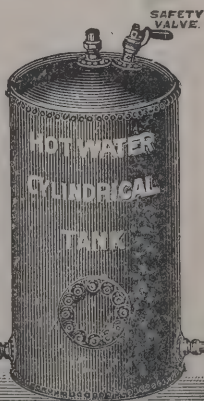
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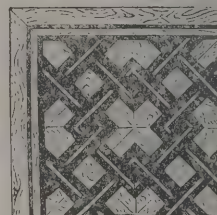
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KING'S ROAD, CHELSEA, S.W.Supply all kinds of Boilers, their Improved and other val  
tested Hot-water Pipes, Castings, Connections and Fittin  
at lowest retail prices.

Telegraph, "Hortulanus, London." Telephone No. 8724



MOULTON.

For alterations and additions to premises at Moulton, Northants. Messrs. BROWN & MAYOR, architects, 63 Abingdon Street, Northampton.

H. Jones	£717	0	0
F. Alright	673	10	0
G. W. Souster	650	0	0
H. Branson	649	0	0
Lewis Bros.	648	0	0
R. Cleaver	632	10	0
A. P. Hawton	626	0	0
G. Harris	622	0	0
W. Higgins	615	0	0
M. Clayson	611	0	0
J. Garrett	589	10	0
E. D. Sharman & Son	579	0	0
Co-operative Builders, Ltd.	569	18	0
T. HIGGS, Northampton (accepted)	548	0	0
Tanner Bros.	540	10	0

NEWTON ABBOT.

For supply of sluice valves, air valves, hydrants, surface boxes, &c., in connection with the laying of about three miles of pipe, 6-inch, 4-inch and 3-inch diameter.

J. D. Young & Sons, Ltd.	£151	5	0
Alldays & Onions	115	6	0
Guest & Chrimes	95	7	6
J. Stone & Co.	93	15	11
Biggs, Wall & Co.	93	1	6
Glenfield & Kennedy	92	0	6
J. BLAKEBOROUGH & SONS, Brighthouse (accepted)	84	4	6
Clay, Henriques & Co.	70	16	3

For supply of about 120 tons of cast-iron pipes, 6-inch, 4-inch and 3-inch diameter, and about six tons of special castings.

J. C. MacEvan & Co.	£872	13	0
R. Laidlaw & Son, Ltd.	868	6	0
T. Spittle, Ltd.	847	14	8
D. Y. Stewart & Co.	837	18	9
Clay Cross Co.	802	6	10
Watson, Gow & Co.	796	18	2
Cochrane & Co., Dudley (accepted)	788	15	8
Biggs, Wall & Co.	775	2	4
Isca Foundry Co.	762	19	8
A. J. Cloake	715	15	5

NEWTON ABBOT—continued.

For laying and jointing about three miles of cast-iron pipes, 4-inch and 3-inch diameter, with all work in connection; and for construction of an open reservoir to hold about 3,400,000 gallons, about 2½ miles from Bovey Tracey.

E. R. Lester	£5,820	0	0
J. C. Lang	5,531	1	4
Hawking & Best	5,518	10	0
W. C. Shaddock.	5,137	10	0
Stephens & Son, Ltd.	4,877	5	5
Woodman & Son	4,731	12	6
M. Bridgman	4,541	16	10
Dart & Pollard.	4,497	0	0
W. Gibson	4,236	10	2
A. JENKINS, Southwell, Notts (accepted)	4,217	12	10

NORTHAMPTON.

For supply and fixing of about 200 yards run of horizontal iron fencing for enclosing part of Abington Park, abutting on the Wellingborough Road.

Dixon & Fish	£223	18	0
A. Bell & Co.	125	2	0
Hill & Smith	115	14	0
Cort, Paul & Cornick	109	0	0
W. Miller & Sons	105	14	0
W. Hayward & Sons, Ltd.	103	0	0
Mawle & Co.	100	12	6
MOBBS & Co., Lion Foundry, Northampton (accepted)	94	10	0

NOTTINGHAM.

For painting the public gas lamps throughout the city.

Allwood & Attewell	£417	0	0
W. M. Timms	415	4	0
R. H. Jarvis	348	18	6
Rainbow	329	0	0
G. MADDOCK, 78 Woodborough Road (accepted)	313	19	3

PLYMOUTH.

For two additional boiler seatings and engine-bed, electricity works, Prince Rock. Mr. JAMES PATON, borough surveyor.

Pearce Bros.	£740	13	0
R. T. Hortop	695	7	0
W. E. BENNETT, 44 South View Terrace, Plymouth (accepted)	671	8	0

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Should you require a thoroughly satisfactory scheme of Ventilation—either Automatic or Mechanical, according to circumstances, combined with Warming by High or Low Pressure Hot-Water, or Steam, for any class of Building—communicate with

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CHARLTON WORKS, SUTTERTON STREET, LONDON, N.

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And we will be most pleased,  
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**CLOSETS,**  
**ETC., ETC.**  
Telegrams,  
“RELiance, WOODVILLE.” The “Defiance” Washdown.





**OSSETT.**

For erection of a villa residence in Ossett, Yorks. Mr. GEORGE PATTERSON, architect, Ossett.

*Accepted tenders.*

R. Oldroyd & Son, mason	£565	0	0
W. Horsnell, joiner	448	0	0
J. Pollard, plumber	210	0	0
R. Clegg, plasterer	1c6	0	0
W. H. Thompson, Batley, tiler	86	0	0

**POTTERHAMWORTH.**

For erection of a brick tower with cast-iron tank, &c., and for providing and laying about 1,850 yards of 3-inch, 2½-inch and 2-inch cast-iron pipes, with valves, standposts, &c., in the village of Potterhamworth, Lincs. Mr. JESSE CLARE, engineer, Sleaford.

*Tower, tanks, &c.*

T. C. Starkey	£1,183	0	0
J. C. Thompson	1,162	0	0
W. G. Henton	1,104	0	0
J. T. Barnes	934	0	0
F. PATTINSON, Ruskington (accepted)	882	0	0

*Pipes, &c.*

J. C. Thompson	626	0	0
Chapman & Ellis	615	0	0
T. C. Starkey	532	0	0
Wakeford	508	0	0
W. G. Henton	469	0	0
T. Rowland	421	0	0
J. T. Barnes	391	0	0
F. PATTINSON (accepted)	378	0	0

**ROCHFORD.**

For erection of a laundry at the workhouse, Rochford, Essex. Messrs. GREENHALGH & BROCKBANK, architects, Bank Chambers, Southend-on-Sea.

S. E. Moss	£2,316	0	0
E. West	2,233	0	0
Davis & Leaney	2,229	0	0
H. Potter	2,213	0	0
J. Band	2,190	0	0
W. E. Davey	2,170	0	0
F. & E. DAVEY, Southend (accepted)	2,085	0	0

**REIGATE.**

For street improvements in St. John's Road, Earlswood. Mr. F. T. CLAYTON, borough surveyor.

*Roadway.*

Lawrence & Thacker	£1,456	0	0
J. Young	1,300	0	0
S. Kavanagh & Co.	1,189	0	0
E. Iles	1,132	0	0
STREETER & TODHUNTER (accepted)	1,077	0	0

*Wide bridge.*

S. Kavanagh & Co.	563	0	0
STREETER & TODHUNTER (accepted)	535	0	0
J. Young	524	0	0
E. Iles	523	0	0

*Narrow bridge.*

S. Kavanagh & Co.	536	0	0
STREETER & TODHUNTER (accepted)	507	0	0
J. Young	500	0	0
E. Iles	498	0	0

**ST. ALBANS.**

For erection of a villa in Cornwall Road. Mr. S. D. EDMUNDS, architect, St. Albans.

W. Stevens & Sons	£310	0	0
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**ST. GERMANS.**

For excavating and removing soil, erection of a retaining wall, and clearing the site for a new schoolroom for the St. Germans Wesleyan school, Cornwall.

Stephens	£160	5	0
Bennett	114	0	0
HOBBS, Liskeard (accepted)	90	0	0

**SCOTLAND.**

For building works, for the Ancient Order of Foresters. Messrs. JOHNSTON & BAXTER, architects, 49 Meadowside, Dundee.

*Accepted tenders.*

J. Binny & Co., Rattray Street, mason	£1,897	0	0
W. & R. Brownlee, Small's Wynd, joiner	797	0	0
A. McRitchie, Temple Lane, plasterer	183	4	0
T. M. Dewar, Constitution Road, plumber	175	0	0
D. Hutchinson, North Lindsay Street, slater	58	0	0

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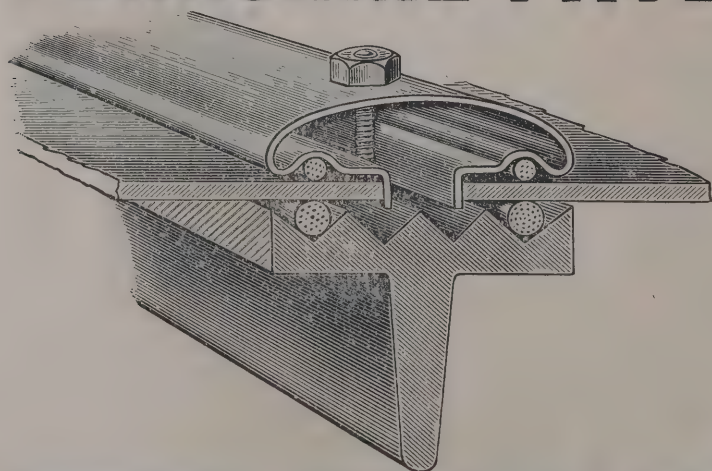
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SCOTLAND—continued.

For construction of about 300 yards of 18-inch fireclay pipe-drain at Haywood. Messrs. JOHNSTONE & RANKINE, engineers, 238 West George Street, Glasgow.  
W. SCOTT, 29 Castle Street, Strathaven  
(accepted) . . . . . 162 5 9

For painters' work of the new house for male patients at Lady'sbridge lunatic asylum, Banff.  
J. & S. Fyfe . . . . . £179 10 0  
C. Innes & Co. . . . . 162 0 0  
J. Jarvie & Sons . . . . . 130 0 0  
A. FERGUSON & CO., Aberdeen (accepted) . . . . . 126 16 0

For buildingwork in connection with the proposed new cemetery.

Accepted tenders.

P. Buchan, Strathmiglo, mason . . . . . £506 6 10  
D. Houston, Cupar Fife, railings and gates . . . . . 126 17 0  
J. & G. Maxwell, Auchtermuchty, joiner . . . . . 19 10 0  
W. Murray, Auchtermuchty, plasterer and slater . . . . . 16 7 6  
W. Lawrie, Falkland, plumber . . . . . 9 5 5  
J. Clark, Auchtermuchty, painter . . . . . 6 14 0

For formation of roadways and walks at the general hospital now being erected at Stobhill, Springburn, Glasgow.

R. Young & Co. . . . . £11,786 0 0  
Exor. of J. Gibson . . . . . 11,437 15 1  
W. Gow & Son . . . . . 10,762 2 1  
J. J. & P. McLachlan . . . . . 9,374 11 0  
W. Wilson . . . . . 9,146 7 4  
A. Stark & Sons . . . . . 8,906 9 2  
A. & J. Faill . . . . . 8,779 14 2  
T. Chrystie . . . . . 8,170 0 0  
J. & J. NEILSON, Glasgow (accepted) . . . . . 7,203 6 8

For erection of new cookery and classrooms at Gallatown public school, Dysart, Kirkcaldy. Mr. D. FORBES SMITH, architect, Kirkcaldy. Quantities by the architect.

Accepted tenders.

Balfour Bros, Sinclairtown, mason . . . . . £817 0 0  
D. Wishart, Pathhead, joiner . . . . . 722 3 7  
J. Easton, Kirkcaldy, plasterer . . . . . 308 2 0  
Blyth & Dingall, Sinclairtown, plumber . . . . . 304 1 7  
R. Page, Pathhead, slater . . . . . 78 0 0

SCOTLAND—continued.

For erection of a farm colony block, for the Glasgow Lunacy District Board.

Brick, &c., work.

T. P. Jamieson . . . . . £6,589 3 7  
Forrest & McLeod . . . . . 6,058 10 9  
R. Murdock & Son . . . . . 6,030 0 0  
J. J. & P. Mc Lachlan . . . . . 5,636 17 7  
E. C. Morgan & Sons . . . . . 5,536 0 0  
Kinnear, Moodie & Co. . . . . 5,190 0 0  
Paterson & Baldie . . . . . 5,178 17 9  
Gibson & Young . . . . . 4,428 13 7  
A. MCINTYRE & SON, 65 Nithsdale Street, Glasgow (accepted) . . . . . 4,997 0 0

Joiner, &c., work.

E. C. Morgan & Sons . . . . . 2,033 2 8  
P. Gaffney . . . . . 1,930 13 1  
Miller & Murray . . . . . 1,890 0 0  
W. Shaw & Son . . . . . 1,857 5 9  
J. Herbertson & Son . . . . . 1,829 7 6  
J. & G. FINDLAY, 24 Grant Street, Glasgow (accepted) . . . . . 1,793 12 6

For supply and installation of heating apparatus at Barnhill poorhouse, Springburn, Glasgow.

D. & J. Tullis, Ltd. . . . . £1,845 0 0  
H. A. Parnel & Co. . . . . 1,681 4 6  
Smith, Allan & Co. . . . . 1,672 8 0  
Lancashire Heating Co. . . . . 1,525 9 0  
Brightside Foundry & Engineering Co., Ltd. . . . . 1,500 0 0  
Mather & Platt . . . . . 1,464 14 8  
J. Spencer & Sons . . . . . 1,352 1 10  
D. McCullum . . . . . 1,293 10 10  
D. Stuart . . . . . 1,284 15 2  
Cameron & Co. . . . . 1,250 10 8  
J. Combe & Son . . . . . 1,211 5 11  
J. McFarlane & Co. . . . . 1,152 9 0  
J. CORMACK & SONS, 36 Abercorn Street, Glasgow (accepted) . . . . . 1,134 8 8  
Steel & Wilson . . . . . 1,117 5 10  
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**STROOD.**

For alterations in connection with providing additional strong-room accommodation and the erection of new lavatory, &c., at the Board-room and offices of the workhouse at Strood, Kent. Mr. G. E. BOND, architect, Pier Chambers, High Street, Chatham.

West Bros. . . . . £145 0 0  
E. WEST, Station Road, Strood (*accepted*) . . . 130 0 0

**SWINDON.**

For painting and repairs at several schools, for the Swindon School Board.

*Accepted tenders.*

G. Kilminster, 62 William Street, Westcott school £82 10 0  
A. E. Tunley, 13 Gloucester Street, Gorse Hill school . . . . . 59 0 0  
A. T. King, Lethbridge Road, Clarence Street school . . . . . 50 0 0  
A. E. Tunley, 13 Gloucester Street, Queenstown school . . . . . 28 0 0

For erection of hanging and dissecting rooms at the Roath abattoirs, Cycle Street, Cardiff. Mr. W. HARPUR, borough engineer.

Williams & Hoare . . . . . £395 5 9  
D. W. Davies . . . . . 390 0 0  
G. Griffiths . . . . . 382 17 0  
Knox & Wells . . . . . 377 0 0  
F. SMALL, Edward Place (*accepted*) . . . . . 370 0 0

**THORNE.**

For lighting of the town of Thorne, Yorks, from Sept. 1 to April 30, 1903.

THORNE GAS CO., LTD., Thorne (*accepted*) . . . Per Burner. £1 8 6

**WALES.**

For erection of Board school buildings at Cwmystwyth. Mr.

J. A. JONES, architect, 7 Queen's Terrace, Aberystwyth.  
Davies & Williams . . . . . £739 0 0  
D. Davies . . . . . 687 0 0  
J. Morgan . . . . . 673 0 0  
H. WRIGHT, Llanfihangel-y-Croyddin (*accepted*) 599 0 0

**WALES—continued.**

For erection of free library at Aberfan. Mr. T. F. HARVEY, surveyor.

C Evans . . . . . £745 0 0  
E. WILLIAMS, Wyndham Street, Dowlais (*accepted*) . . . . . 695 12 0

For erection of a physical laboratory and workshop at the Tredegar county school, Mon.

R. Edwards . . . . . £650 0 0  
D. J. VAUGHAN, Commercial Road (*accepted*) . . . 508 7 0

For erection of free library and public hall, Trecynon, Aberdare. Mr. C. H. ELFORD, architect, 30 Weatheral Street, Aberdare.

D. T. DAVIES, 73 Llewellyn Street (*accepted*) . £2,059 0 0

For painting, colouring and decoration of Trinity Calvinistic Methodist chapel, Aberkenfig. Messrs. J. & F. J. HURLEY, architects, 10 Bridgend Road, Aberkenfig.

J. C. Edwards . . . . . £97 0 0  
Gough Bros. . . . . 78 7 0  
F. Bartlett . . . . . 69 15 0  
J. Richards . . . . . 67 6 0  
R. LOTT, Bridgend (*accepted*) . . . . . 66 10 0  
J. W. Edwards . . . . . 47 0 0

**WEALDSTONE.**

For forming, making-up and providing proper means for lighting the entrance road to the Wealdstone recreation ground. Mr. F. HILL PARR, surveyor.

Meston & Hale . . . . . £399 8 3  
W. HOLLINGSWORTH, Wealdstone (*accepted*) . . . 335 15 1

**WEMBLEY.**

For street works in Ranelagh Road, Wembley, Middlesex. Mr. C. R. W. CHAPMAN, surveyor.

Wallace & Son . . . . . £1,254 3 4  
C. Ford . . . . . 1,074 0 0  
T. Adams . . . . . 999 0 0  
G. R. Mann . . . . . 980 0 0  
Free & Sons . . . . . 959 8 3  
Meston & Hale . . . . . 949 10 10  
Hollingsworth . . . . . 934 7 1  
Wilson, Border & Co. . . . . 906 16 8  
H. HAYNES, Alperton, Wembley (*accepted*) . . . 889 10 0  
Nowell & Co. . . . . 850 0 0  
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WEST CORNFORTH.

For erection of a club hall and manager's house at West Cornforth, Durham. Mr. H. T. GRADON, architect, Market Place, Durham.

Ward Bros.	£1,993	0	0
T. Lazonby	1,689	0	0
G. T. Manners	1,649	0	0
D. D. Hall	1,540	0	0
J. T. Mann	1,492	9	6
R. TELFER, Spennymoor (accepted)	1,426	10	0

WEST HAM.

For street works in Janet Road, Saxelby Road, Lucke Road. Mr. JOHN G. MORLEY, borough engineer.

Wallace & Inns	£4,999	14	7
T. Adams	3,271	1	11
W. Griffiths & Co., Ltd.	3,261	3	8
D. J. Jackson	3,130	7	11
J. JACKSON, Broadway, Plaistow (accepted)	3,035	8	10

For supply of two steel chimneys, four fans and engines for induced draught, all brickwork in connection with the flues, economisers. Mr. J. K. BOCK, borough electrical engineer, Abbey Mills, West Ham.

Accepted tenders.

Babcock & Wilcox, Ltd, Oriol House, Far- ringdon Street, E.C., brickwork	£3,425	0	0
Babcock & Wilcox, economisers	2,480	0	0
W. H. Allen, Son & Co., Bedford, fans and engines	2,200	0	0
Babcock & Wilcox, steel chimneys	1,648	0	0

WESTON-SUPER-MARE.

For construction of a stone lifeboat-house, with timber slipway, &c., on the foreshore of Birnbeck Island. Mr. W. T. DOUGLAS, architect, 15 Victoria Street, Westminster, S.W. W. H. POLLARD, Bridgwater (accepted) . . . £2,230 0 0

For erection of stone gate piers and coping, and fixing of railings, &c., at Knightstone. Mr. HUGH NETTLETON, surveyor.

G. Sprake	£114	15	0
C. Fear	112	0	0
Bryant & Sons	111	12	6
W. H. STACY, Walliscote Road, Weston-super- Mare (accepted)	110	0	0

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A NEW discovery in decorative work, which is at once elegant, eminently artistic, permanent and relatively inexpensive, has just been perfected, and specimens may be inspected at 369 Oxford Street, W.

Pyrochrom is the name applied to a newly-discovered process by which the most artistic effects are produced on plain or silvered glass in translucent colours, which are applied in such a manner as to be equally perfect whether viewed from front or back. By its means windows, glass doors, &c., can be decorated in a highly effective manner. The most striking results, however, are perhaps attained in the case of mirrors, panels, &c., the effects produced by these when lighted from behind by electricity, gas or other illuminant being strikingly beautiful.

The process is obviously of the greatest value in the decoration of private houses, hotels, cafés, restaurants, &c., especially in buildings of a public nature, as it is practically indestructible. It also has a wide field for advertising purposes, effective tablets or pictures of a durable nature being produced at very small cost.

The following are among the advantages which the Pyrochrom Company claim—and, as it appears to us, with justice—for their new and very artistic production :—

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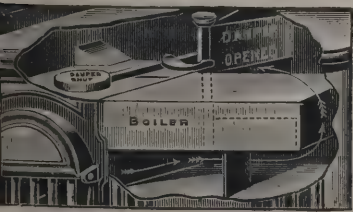
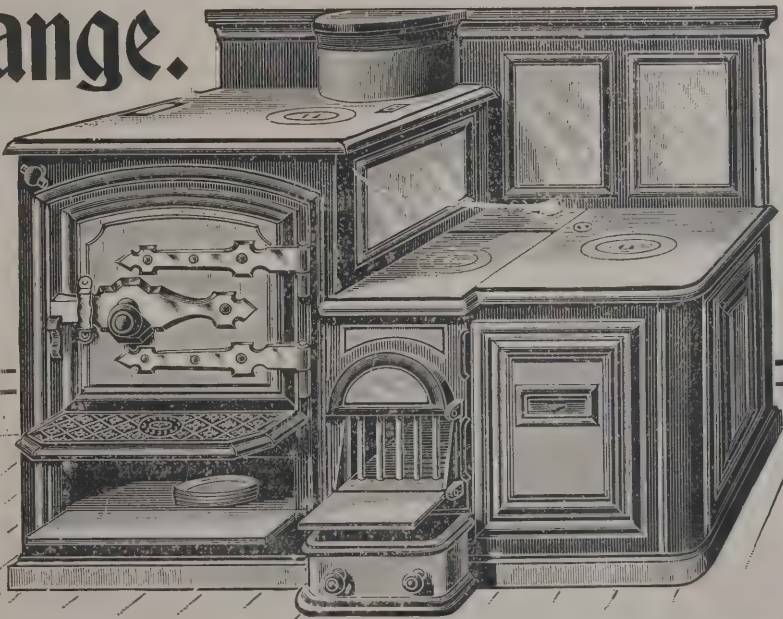
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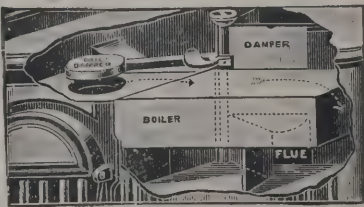
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The above shows the heat concentrated under the boiler and the waste heat passing under the not plate.

This Independent Range is fitted with hot water circulating boiler as shown in the sections, and the heat of the fire passes direct under the bottom of the oven.

A Fire Brick Dome and damper is fitted over the fire, which enables the heat to be concentrated at pleasure on the hot plate or boiler, the waste heat of either passing under the other, thereby utilising what is usually lost.



The above shows the heat of the fire concentrated on the hot plate and the waste heat passing under the boiler.

The casing and oven door are lined with slag wool and a third oven can be arranged if required.



employed the colours are to all intents and purposes everlasting.

*Magnitude of Design.*—In the old and mosaic process every colour, every shade even, demanded a separate sheet of coloured glass, which had to be cut and fitted by a skilled glazier, and the joining lines hidden as well as could be by strips of metal, or "stippling," and by various other makeshifts. Pyrochrom presents one unbroken surface, thus adding greatly to the general effect of the picture.

*Cheapness*—By Pyrochrom a perfect and lasting picture can be obtained at such a price as to bring it within easy reach of the million.

PLANS for the erection of that section of the new Glasgow and West of Scotland Technical College and Science and Art Buildings, which is to occupy the ground recently acquired from the School Board of Glasgow and the site of Anderson's College, have now been passed by the Dean of Guild Court. The new buildings are in the Renaissance style, and are to be built of red sandstone, and constructed to accommodate altogether 5,000 students—a number slightly in excess of those attending the college at the present time. The plans show a structure of imposing size and architectural elegance, one which will form a valuable addition to the public buildings of the city. The portion to be erected at present will run parallel with Montrose Street. On the ground floor will be accommodated the department of natural philosophy. With the exception of two or three rooms to be used for general purposes, the second floor will be devoted to the department of natural science. The third floor will provide accommodation for the department of architecture and building construction, while the chemical department and the department of technical chemistry will be housed on the top floor, the whole of which they will practically occupy in the completed building. Behind the Montrose Street section of the college, and running parallel to it, will be three blocks of buildings. The first block will contain a portion of the electrical engineering department, but will be principally occupied by the examination hall. In the next block the remainder of the electrical engineering department will be housed, while the third block will embrace rooms for woodworking classes and the department of mining and geology. A wing connecting the three blocks will be occupied by the department of prime movers, mathematics and metallurgy. Mr. David Barclay, St. Vincent Street, is architect of the new technical college.

### THE SANITARY INSTITUTE.

THE preliminary programme of the nineteenth congress, to be held in Manchester from September 9 to September 13, has now been issued. The president of the congress is the Right Hon. the Earl Egerton of Tatton. Mr. W. N. Shaw, F.R.S., will deliver the lecture to the congress, and Sir W. J. Collins, M.D., the popular lecture. Excursions to places of interest in connection with sanitation and a conversazione will be arranged for those attending the congress. It appears from the programme that over 300 authorities, including several county councils, have already appointed delegates to the congress, and, as there are also over 2,500 members and associates in the Institute, there will probably be a large attendance in addition to the local members of the congress. In connection with the congress a health exhibition of apparatus and appliances relating to health and domestic use will be held as a practical illustration of the application and carrying out of the principles and methods discussed at the meetings; it not only serves this purpose, but also an important one in diffusing sanitary knowledge among a large class who do not attend the other meetings of the congress.

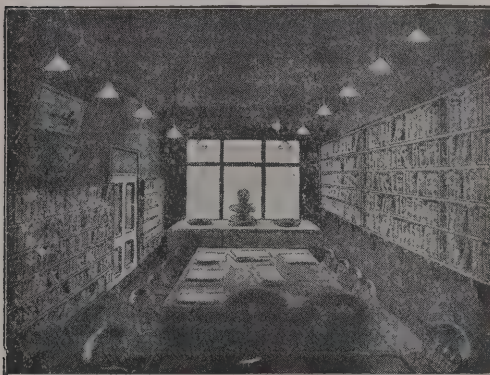
The congress will include three general addresses and lectures. Three sections meeting for two days each, dealing with (1) sanitary science and preventive medicine, presided over by Sir James Crichton-Browne, M.D.; (2) Engineering and architecture, presided over by Sir Alexander Binnie; (3) Physics, chemistry and biology, presided over by Professor A. Sheridan Delepine. Eight special conferences—Municipal representatives, presided over by Alderman Alexander McDougall, J.P.; port sanitary authorities, Alderman Walton Smith, J.P.; medical officers of health, presided over by Dr. James Niven; engineers and surveyors to county and other sanitary authorities, presided over by Mr. Charles Jones, C.E.; veterinary inspectors, Mr. W. Augustus Taylor; sanitary inspectors, presided over by Mr. W. Bland; domestic hygiene, presided over by Mrs. W. O. Meek; hygiene of school life, presided over by Professor C. S. Sherrington.

The local arrangements are in the hands of an influential local committee, presided over by the Lord Mayor of Manchester, with Mr. J. H. Reynolds, principal of the Municipal School of Technology, as honorary secretary.

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Cluny, No. 45.



## TRADE NOTES.

MESSRS. W. POTTS & SONS, clock manufacturers, Guildford Street, Leeds, have received instructions to make and fix a chime clock in the tower of Moorsholm Church, North Yorkshire, from Mr. R. R. Petch.

THE new infectious diseases hospital, Newcastle-under-Lyme, is being warmed and ventilated by means of Shorland's double-fronted patent Manchester stoves, with descending smoke flues, by Messrs. E. H. Shorland & Brother, of Manchester.

THE New Guide Book for purchasers just issued by Messrs. J. W. Benson, Ltd., of Ludgate Hill and Old Bond Street, is one of the handiest books we have seen for general information to all those anxious to possess a watch, chain or a ring, to a fitted travelling case, on the monthly payment system, which J. W. Benson still have in vogue, this plan continuing to meet with great success.

MESSRS. G. M. RESTALL & SON, adamantine plaster manufacturers, of Soho Pool Wharf, Birmingham, who have, by the way, just attained their majority, having been established upwards of twenty-one years, are sending out a newly revised circular descriptive of their plasters and cements, and containing instructions for their use and an enumeration of the uses to which they can be applied, as well as a list of the buildings in which they have been employed and another of names of builders and contractors who have successfully used them.

MESSRS. JOHN KING, LTD., the warming and ventilating engineers, of Liverpool, with a view to meeting the convenience of their clients in London and the Southern counties, have opened offices at No. 7 Quality Court, Chancery Lane, London, to which all inquiries should be addressed. Messrs. King have recently fitted up their well-known heating apparatuses for the Duke of Westminster, the Marquis of Cholmondeley, the Earl of Derby, the War Office, and H.M. Board of Works; and the firm's contract for the warming and ventilating of the new lunatic asylum at Portrane, co. Dublin, amounting to nearly 20,000l., which is the largest contract that has ever been let in Great Britain for work of this sort, is rapidly approaching completion.

## ELECTRIC NOTES.

THE units of electricity generated in Greenock during the four weeks ending June 28, numbered 22,235, 17,505 being

sold, or 9,066 more than for the same period last year. For traction purposes 55,865 units were supplied. The applications for supply now number 277, which is equivalent to 35,418 8 candle-power lamps.

AT a special meeting of the Renfrew Town Council a notice was read from the Electrical Supply Corporation intimating that they intend to apply during next session for a provisional order under the Electric Lighting Acts, and if obtained they intend to exercise the statutory powers conferred by these Acts within the burgh. After consideration, the Council agreed to oppose the application.

AT a meeting of the Kilmarnock Town Council the electric committee reported that they had offered Mr. Bryson, who had been appointed engineer for a scheme of electric lighting in the burgh, a sum of 330l. as a settlement in full of his claim and expenses, in consequence of the scheme having been in the meantime abandoned, and that Mr. Bryson, whose original claim was 976l. 17s. 3d., had signified his willingness to accept this sum.

THE West Ham Borough Council, who were the first body in the east of London to light their district by electricity, have just accepted a tender amounting to 108,900l. for the construction and equipment of a system of electric trams for the borough. The southern districts—Plaistow and Canning Town—will be chiefly benefited by the enterprise of the Council. The rails are to be made in England, and it is hoped as far as possible to employ men in the constructional works who reside in the borough.

AT the monthly meeting of the Town Council, on the motion of Bailie Service, a committee was appointed to consider the advisability of applying to Parliament for a provisional order giving the Council the right to become the distributors of electricity within the burgh. As a result of opposition to the Clyde Electric Power Bill, a clause was inserted giving Dumbarton and Kirkintilloch power to apply for such an order within a specified time, without the opposition of the company. In answer to a councillor, the clerk said that if they obtained this order, which was likely, work would have to be proceeded with within a specified time.

AN important movement, having for its object the supplying of electricity for lighting and traction purposes throughout Carnarvonshire, has just been set on foot by Sir William Preece, K.C.B., and Mr. Charles H. Rees, Carnarvon. In the course of an address at the Cymmwdorion section of

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the National Eisteddfod, held at Carnarvon in 1894 on the industrial resources of Wales, Sir William Preece referred to the unusual facilities afforded by the district for an electric installation on a large scale. Since then various schemes have been propounded, but it is only now that anything like a workable scheme has been presented. It is proposed not only to introduce electric light into the populous centres of the county, but to construct electric tram lines and to seek the co-operation of quarry-owners with the view to the substitution of electricity for steam-power. The movement has already met with considerable support, and although a very large sum will be needed to carry out the scheme, it is believed there will be no difficulty in raising the necessary capital. Several smaller schemes for isolated districts have for some time been maturing, but it is felt that one large and comprehensive scheme for the whole county is more likely to be carried to a successful issue. In order to further discuss and consider the proposals an influential county meeting is to be held at Carnarvon on the 14th inst., when Sir William Preece will explain his views and enter fully into the details of a project which cannot fail to have a most beneficial effect on the industries of the whole district.

### VARIETIES.

THE new church which has been erected in St. Stephen's parish of Smethwick will be consecrated on the 25th inst. by the Bishop of Lichfield.

THE members of the Durham Archaeological Society made a two days' excursion to North Yorkshire on Thursday and Friday last week, Canon Greenwell, F.S.A., acting as cicerone.

AFTER being closed for two months for renovations, High Street Methodist New Connexion chapel, Huddersfield, was reopened on the 10th inst. The whole outlay will be between 800*l.* and 1,000*l.* There was already a debt on the chapel of 1,500*l.*, and a bazaar is to be held next May to raise 2,000*l.*

ON the 12th inst. at Morecambe the opening took place of the new United Methodist Free church, Sandylands, erected to meet the needs of the west end of the town. The new building is of stone, the interior being pitch-pine, with stained-glass windows. The cost of the building and land was 7,388*l.*

AN important extension of the Southern Outfall sewage works of the Ossett Corporation has been recently carried out

at an outlay of about 9,200*l.* Thirty-two acres of additional land have also been acquired for sewage treatment. The extension was formally opened on Monday.

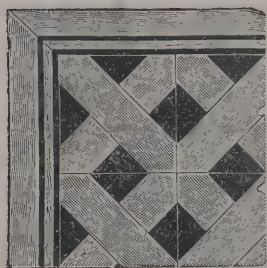
THE new district wash-houses erected by the Dundee Town Council at Constable Street were opened last week. They have cost 7,140*l.*, while the cost for the wash-houses and baths at Caldrum Street, which will soon be opened, is 5,746*l.*, the total expenditure on the two places being 15,126*l.*

IN view of the strong opposition manifested at the inquiry respecting the site selected by the Kettering Urban Council for their refuse destructor, and the suggestions that there were other sites less open to objection, the Local Government Board thought it desirable that the Urban Council should further consider the matter.

A BRITISH and Colonial Industrial Exhibition, under the patronage of Lord Milner, Sir J. Gordon Sprigg and other Cape magnates, will be held in Cape Town during the months of November, December, January and February, 1903 and 1904. The manager will be Mr. A. P. Baker, F.R.C.I., of Cape Town. An English office has been opened at Seymour Grove, Manchester.

THE *Standard* Berlin correspondent telegraphs:—According to reports from Stockholm the plans for a new canal between Gothenburg, on the west coast of Sweden, and Wenersburg, on the large Wener lake, have now been drawn up on the basis of the surveys instituted in 1900. This enterprise is intended by the Swedish Government to supplement the old canal connecting the Baltic with the North Sea, which is no longer able to cope with a traffic doubling itself every twenty years. The new canal will take from seven to eight years to construct, and will cost 32,000,000 Scandinavian crowns. The depth will be about 20 feet, which will allow vessels of a tonnage up to 4,100 tons to pass through. Its yearly carrying capacity is estimated at a maximum of 20,000,000 tons.

THE Midland Railway Company have just opened at the Sandon and Canada Dock station, Liverpool, new provision warehouses, with cellars for the storage of bacon, lard, butter, cheese, &c. Built of brick, with concrete floors, and practically fireproof, the new station is centrally situated on the line of docks, and merchandise of all kinds can be rapidly transferred from ship to warehouse. All kinds of provisions requiring storage at a low temperature will be specially accommodated



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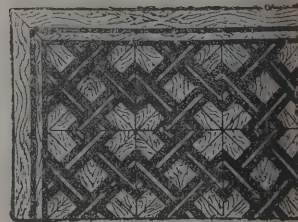
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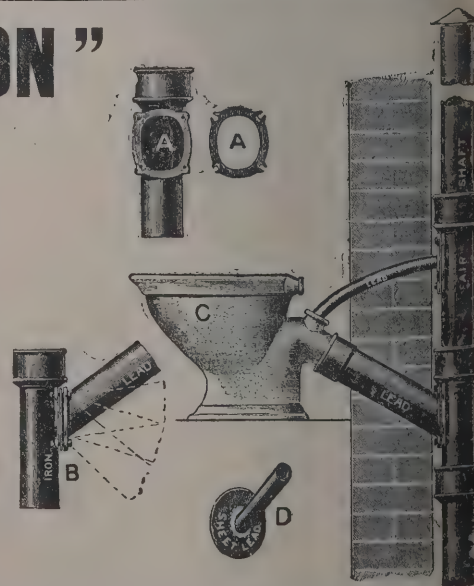
C—Shows the one size which can be adapted for 4 in. Soil Pipe, and a 4 in.  $\times$   $1\frac{1}{2}$  in. Invert Junction for Anti-siphon Pipes, &c.

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A PORTION of an old brass showing the dress of a female effigy was found some years ago in the ancient parish chest in Holy Trinity Church, Stratford-on-Avon, and by direction of the vicar the brass was preserved. It has just been shown to the Rev. J. Harvey Bloom, rector of Whitchurch, near Stratford, a well-known antiquarian, who has pronounced it to be part of the effigy of Agnes Pagette, wife of the famous Master of the Guild of the Holy Cross, which was founded in Stratford about the twelfth century. The inscription on the brass is recorded in Dugdale's "History of Warwickshire," and the brass itself has long been lost. The recovery of a portion of it has excited a good deal of public interest, and the vicar and churchwardens have been asked to show it in a conspicuous position in the church.

THE new textile school in connection with and adjoining the buildings of the Heginbottom Technical School, at Ashton-under-Lyne, was opened on the 5th inst. by the mayor of Ashton (Mr. J. B. Pownall). The building, which consists of two storeys, has taken nearly two years to erect and to equip with the necessary machinery, and has cost about 7,000*l*. The movement owes its inception to the public spirit of Mr. Councillor Barlow, the late Mr. Alderman Marland, Mr. Samuel Newton, Messrs. Hetherington & Sons, of Manchester, and others. Every department of an up-to-date cotton mill is represented. There are, in addition, two complete sets of spinning and weaving machinery, jacquard and other looms for pattern weaving, power and light being supplied by electricity.

ON Friday last about twenty members of the Liverpool Engineering Society visited the extensive quarries of Messrs. Darbshire, Limited, Penmaenmawr, on the invitation of Mr. C. Darbshire, a past president of the Society, and after luncheon inspected the quarries and all the numerous stages in the preparation of macadam, &c. Amongst other interesting items a big blast had been arranged for on a given signal by means of an electrical cable. A charge of nearly half a ton of

powder was fired, displacing a mass of stone from the mountain's side, accompanied by a terrific explosion. An exhibition of sett-making was also given. After the quarries had been inspected the party partook of dinner at the residence of Mr. C. Darbshire. Mr. Wilcox proposed a vote of thanks to the host and hostess, to which Mr. Darbshire replied. After a stroll round the grounds the party broke up. Amongst the gentlemen present were Messrs. F. Priest, Wilcox, A. W. Duncanson, A. Leighton, B. Cunningham, G. C. Kenyon, &c.

A COMMODIOUS and attractive open-air swimming-bath, which has been constructed for the benefit of the residents of Port Sunlight, was formally opened by Lord Stanmore, G.C.M.G., on the 5th inst. The bath is very centrally situated, being on land to the north of Bolton Road, and is built on the most modern principles, both as regards health and convenience. The shape of the bath is oval and its measurements are 100 feet long, 75 feet across, 3 feet 6 inches deep at the shallow end and 7 feet 3 inches at the other end. Here a capital diving platform has been erected, the highest point for diving being about 25 feet. Separate dressing-boxes and large dressing-rooms for boys have been erected, and altogether the bath is excellently equipped, and is bound to prove itself of great advantage to the residents of the district. It has cost 2,617*l*.

ON Saturday the 5th inst. members of the Bristol rowing world assembled to witness the formal opening by the Lord Mayor of the new and commodious boat and club house which the Redcliff Rowing Club has just erected. The house, a two-gabled and two-storeyed one, is 54 feet by 17 feet wide. The foundation is piled, and on the lower floor is accommodation for twenty boats, which can be run along a platform to water level. The upper storey consists of three rooms, the central one being a large, well-arranged dressing-room for men. To the right is situated a ladies' room, which is divided by a movable partition, so that on those occasions when the whole building is placed at the disposal of the sterner sex the two rooms can be thrown into one for gymnastics or smoking concerts. On the left of the men's room are a couple of shower baths and lavatories. Verandahs on either side of the building overlook the river, and on the Bristol Bridge side staging has been built for pleasure boats, while on the other side there is a similar structure for use by those who go in for rowing seriously. The interior woodwork is of Carolina pine, the light character of which gives the place a bright and comfortable appearance. The fittings throughout are of an up-to-

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date character, and electric light has been laid on throughout. The cost of the building amounts to about 600*l*. The work has been carried out by Messrs. T. Lovell & Sons, from plans prepared by Mr. James Hart, of Corn Street.

THE sanitary committee of the Leeds City Corporation spent a considerable time recently discussing the laundry arrangements in connection with the new fever hospital at Manston and the smallpox hospital at Killingbeck. Various methods of effecting the necessary alterations and improvements have been debated from time to time, these ultimately taking shape in the scheme now resolved upon, by which the number of boilers at Manston will be doubled, and an extension of the premises carried out in accordance with plans submitted by the architect to the committee. The Manston Hospital laundry will also be lighted by electricity, as will be that at Killingbeck; but the latter will be heated by steam generated at Manston, and supplied with light from the same place. It was the doubt which some members felt as to the feasibility of conveying the steam unexhausted through pipes from Manston to Killingbeck which led to the lengthy discussion of the subject, though the distance being only about a quarter of a mile, expert opinion showed that the plan was perfectly workable, and indeed something similar was already being done elsewhere.

### BUILDING AND BUILDERS.

AT Birkenhead last week the foundation-stone was laid of a new Sunday school in connection with the Oxton Road Congregational church, designed by Mr James H. Cook. The building, which includes a hall capable of holding 440 adults, has been constructed at a total cost of 3,500*l*.

THE contract has been let for the erection of a mission church on Eccles New Road, Manchester. The new building will be attached to St. Luke's and the site is half-way between Weaste and Eccles. The building will be principally terracotta with stone dressings, and will cost upwards of 4,000*l*.

THE foundation-stone was laid on the 6th inst. at Woodford Halse, Northants, of a new voluntary school, which is to cost about 900*l*. The school, which was designed by Mr. W. E. Mills, of Banbury, will contain a schoolroom 35 feet by 20 feet, and two classrooms 20 feet square. It is expected that the building will be completed about next Christmas.

THE Mayor of Swansea announced at the monthly meeting of the Harbour Trust that the new stock, amounting to 350,000*l*, recently raised would enable the Trust to commence the construction of the projected new dock at an early date. The scheme will cost two million pounds.

MEMORIAL-STONES have been laid for a new Wesleyan Methodist mission-hall in Cowley Road, Walton. The hall is being built to meet the needs of a large new residential neighbourhood on the west side of Anfield cemetery, and is an extension of the work of Kirkdale Wesleyan chapel.

THE foundation-stone has been laid of St. Columba parish church, which is to be built on a site in St. Vincent Street, Glasgow. The new church replaces the building in Hope Street, which had to be removed two years ago in connection with the operations of the Caledonian Railway Company, and which was one of the churches in the city in which Gaelic services were regularly held.

IT is reported that a well-known and old-established firm of ironmasters in the Black Country are contemplating laying down at an early date a new forge and rolling mills on the site formerly occupied by the blast-furnaces which were carried on successfully for a great number of years by Messrs. Bennett & Co., and latterly by an Oldbury brick company. The prospects of the iron trade in this portion of the Black Country are said to be improving.

THE tender of Mr. Thomas Rowbotham, builder and contractor, Coventry Road, Small Heath, for the foundations of the new buildings of the Birmingham University, has, we understand, been accepted. The amount of this contract will probably be between 40,000*l*. and 50,000*l*. Last week Mr. Rowbotham also secured the contract for the erection of a workhouse and infirmary at Wormwood Scrubs for the Hammersmith Board of Guardians, the amount of the tender, particulars of which we published, being 187,777*l*.

A NEW fire station is about to be erected on the site on which stood The Cedars, at the junction of Grafton Square and Old Town, Clapham. The freehold cost 3,000*l*, and on it it is intended to erect a building which shall be the superintendent's station for the E district. Mr. A. A. Allen, the chairman of the fire brigade committee of the London County Council, laid the foundation-stone on Saturday, and was thanked on behalf of the inhabitants by the Mayor of Wandsworth.

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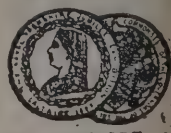
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THE Town Council of Pittenweem, N.B., has agreed to carry out, at a cost of about 700*l.*, a scheme by Mr. Currie, architect, Elie, for altering and improving the present sewage of the burgh, with the view of giving effect to the recommendations of Professor Hunter Stewart, who, at the request of the Town Council, recently reported on the sanitary condition of the burgh in connection with the frequent outbreak of typhoid therein.

It was the wish and intention of those who originally designed Trinity Congregational church, Reading, that at some future date it should be surrounded by a fence in keeping with the general appearance of the church itself. Wednesday, the 9th inst., saw the commencement of the carrying out of that wish, when Sir Peter Spokes "well and truly laid" the foundation-stone of the wall now in course of erection. The new fence will consist of a dwarf wrought-iron railing on a low battering wall of Swindon stone coped with rubbed Robinhood stone. The fence will be constructed in panels, piers of Swindon stone with Robinhood stone caps occurring at intervals between the panels of railing. There will be four sets of double-entrance gates and one single gate of wrought-iron, all hung to massive square piers. The whole of the work is being executed from the designs and under the supervision of Messrs. Ravenscroft, Son & Morris, architects, Reading.

THE foundation-stone was laid last week of the new women's infirmary in connection with the union workhouse at Stratford-on-Avon. The scheme includes a new laundry, fitted with the latest engineering appliances, the total cost of the works (exclusive of furnishing) being about 7,000*l.* The stone-laying was of a semi-private character, and was performed in the presence of the Guardians and a few friends by Mr. J. Cove Jones, who for over twenty-three years has filled the position of chairman of the Board. The Guardians have accepted the tender of Messrs. J. G. Fincher & Co., of Stratford, to erect the new laundry for the sum of 1,415*l.*, and the offer of Messrs. Barford & Perkins, of Peterborough to carry out the engineering work for 1,819*l.*

THE thirteenth annual picnic in connection with the North Staffordshire Builders' Association took place on the 10th inst., when a visit was paid to Warwickshire. A special train left Stoke-upon-Trent at 8.20 in the morning for Coventry. The party consisted of about 300, comprising members of the Association, their wives and friends. The arrangements were carried out by Mr. J. Bowden, secretary. The visit to St.

Michael's Church and St. Mary's Hall could not take place owing to the late arrival of the train, so the party proceeded at once to the King's Head hotel. After lunching they drove to Kenilworth Castle, a distance of five miles, along a road which is interesting from its historical associations. On returning to Coventry the party proceeded to Bournville for the purpose of seeing this model village.

NINETEEN master and operative plumbers applying for registration under the National Registration of Plumbers attended for examination on Saturday at King's College by the Worshipful Company of Plumbers. The candidates were from various parts of London, and also from Bedford, Egham, Redhill, Rochester and Saffron Walden. The practical test included lead-bossing and the making of plumber's joints, &c. The examination questions included the subjects of contamination of drinking-water from faulty connections, roof covering, arrangement of bath, sink and closet wastes, drainage of town houses and disconnection with sewers. The examiners were Mr. Charles Hudson, master plumber, chairman of Board of Examiners; Mr. J. Knight, master plumber; and Messrs. F. Oakes and G. Wilson, representing the United Operative Plumbers' Association of Great Britain and Ireland. Nine candidates succeeded in passing the examination.

AN important and expensive work was inaugurated at Sealand on the 7th inst., when the first sod was cut of the new purification works for Chester. The new works, which were rendered necessary in consequence of the old outfall works being inadequate to meet the increasing requirements of the city and district drainage area, are situated on the east of and adjacent to the present works, and embrace about an acre of land purchased by the Corporation for the purpose. On this site will be constructed the tanks and filter-beds in which the sewage will be subjected to bacteriological treatment. To cover the cost of the scheme the Corporation have borrowed a sum of 56,000*l.* The ceremony, which was of a simple nature, was attended by the Mayor and a number of city councillors and others interested in the undertaking. Councillor John Jones, chairman of the sewerage committee, gave a short description of the proposed works, and the Mayor thereafter cut the first sod for the first tank, and Councillor Jones a sod for the first filter. The Mayor was presented with a miniature silver spade by Major Tulloch, and a similar memento was presented to Councillor John Jones by Messrs Underwood Brothers.

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12s. 11d. per 100: 17 1/2" x 3" x 2" ditto, 8s. 11d. per 100;  
17 1/2" x 3" x 1 1/2" ditto, 6s. 10d. per 100.

Also in Pitch Pine. Prices on application.



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conceal nails at following very low prices:—

1 1/2 x 4 1/2" Wainscot Oak	at 53s. 0d. per square.
1 x 4 1/2" ditto	at 42s. 6d. "
1 1/2 x 4 1/2" Pitch Pine	at 23s. 0d. "
1 x 4 1/2" ditto	at 12s. 6d. "

These prices do not include desiccation.

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**ELECTRIC LIGHTING IN TRURO.**

THE Corporation of the city of Truro have resolved to consider the question of lighting the city by electricity. A special committee has been appointed for this purpose, of which Mr. Silvanus Trevail, P.S.A., has been elected chairman. The following report was presented and adopted at the last meeting of the Council:—

*Supplementary Report.—Electric Lighting Committee, June 25 and July 3, 1902.*

Your committee met on the above dates and beg to make the following report and recommendations:—

1. That the town clerk be instructed to advertise in the *Electrician* and the *Electrical News* as follows:—

*Electric Lighting Committee.*

The electric lighting committee of the city of Truro are prepared to receive proposals for the electric lighting of the city on or before July 31 instant.

2. Having considered notices of intention to apply for provisional orders from Messrs. Deacon & Co., the United Electric Light and Power Company and the Provincial Electric Supply and Traction Company for the purposes of supplying electricity within the Council's area, your committee recommend that the town clerk write and inform them that the Council have already an electric lighting order for the city of Truro, and will be glad to receive suggestions from any firm relative to an electrical lighting installation.

(Signed) SILVANUS TREVAIL, Chairman.

**THE LONDON COUNTY COUNCIL HOUSES.**

A REPORT from the housing of the working classes committee embodies the accounts in respect of the Council's working-class dwellings and the Parker Street lodging-house tenements for the year ended on March 31 last. The dwellings mentioned in these accounts comprise 2,591 tenements, 358 cottages and 324 cubicles, providing accommodation for a total of 15,952 persons, whilst those mentioned in the previous year's accounts comprised 2,041 tenements, 305 cottages and 324 cubicles, providing accommodation for 12,196 persons. The following is a list of the new dwellings which have been opened during the year to which the accounts refer:—Rossetti Buildings, Millbank Estate, accommodates 290 persons; Lowood and Chancery

Buildings, Cable Street, Shadwell, 276; Hardy Cottages, Trafalgar Road, Greenwich, 306; Toronto and Montreal Buildings, Cotton Street, Poplar, 360; Adelaide Buildings, Ann Street, Poplar, 190; Battersea Bridge Buildings, 278; Reynolds Buildings, Millbank Estate, North Block, 200; East Block, 205; Mulready Buildings, Millbank Estate, 230; Maclise Buildings, Millbank Estate, 296; Landseer Buildings, Millbank Estate, 230; total, 2,856. Since the end of the year to which the accounts relate up to the present date the following new dwellings have been opened for occupation:—Fletcher Buildings, Duke's Court site, accommodation, 230 persons; Battersea Bridge Buildings, Folly Cottage, 8; Lawrence Buildings, Millbank Estate, 296; Beaumont Buildings, Duke's Court site, 190; Sheridan Buildings, Duke's Court site, 190; Morland Buildings, Millbank Estate, 300; total, 1,214.

The total gross income for the year amounted to 58,058*l.* 15*s.* 6*d.*, and of this 53,315*l.* 14*s.* 4*d.*, or 91·83 per cent., was required for outgoings during the year, as against 94·76 per cent. required during the year 1900-1. There is thus a surplus balance on the year's working of 4,743*l.* 1*s.* 2*d.* The outgoings include central office charges, the cost of local supervision and collection of rent, rates and taxes, lighting, water and insurance, stores and incidentals, an amount set aside for the cost of repairs and renewals, together with interest and sinking fund charges in respect of debt. Of these items, rates and taxes have increased in almost every case, but economy has been effected principally under the head of lighting, water and insurance. With regard to the amount set aside for repairs and renewals, after paying for all repairs a sum of 11,125*l.* 12*s.* remains to the credit of the repairs and renewals fund, as compared with 8,934*l.* 18*s.* 2*d.* on March 31, 1901. This forms a reserve to meet the heavier expenses under this head which may be expected as the dwellings become older. The committee observes:—"In some few cases difficulty has been experienced in letting tenements, notably at Battersea Bridge Buildings; but on the whole the average loss of rent by empties has been comparatively small. The amount of rent written off as irrecoverable represents only 10*s.* per cent. of the rent receivable. The accounts show that, taking one year with another up to date, there is, as a whole, no deficiency on income account as a result of the Council deciding itself to erect and manage dwellings; that is to say, the balances in hand in respect of all the dwellings are now such that all previous contributions from the rates

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might be repaid, and the accounts would still show a surplus balance. This we cannot but regard as a satisfactory state of affairs. The total expenditure on capital account on all the dwellings up to March 31, 1902, amounted to 931,459*l.* 3*s.* 1*d.* This sum represents the actual payments made up to that date, and does not include liabilities under contracts for buildings in course of erection. Though the net result of the year's working of all the dwellings erected by the Council shows that there is no charge on the county rate in respect of such dwellings as a whole, it will be seen from the accounts that where debit balances obtain they are chiefly in respect of dwellings erected under Improvement Acts, whereas the credit balances are chiefly in respect of dwellings erected under the Housing of the Working Classes Act. We are advised that owing to the fact that the money to make good any deficiency must, in the case of dwellings erected under the Housing Act, be provided out of the special county rate, and in the case of dwellings erected under Improvement Acts out of the general county rate, it is not possible to make any actual transfer of the surplus under the Housing Act so as to reduce or clear off the deficiency under Improvement Acts."

### COLLEGE FOR NORTH STAFFORDSHIRE.

The treasurer and secretary of the Council for the Extension of Higher Education in the Potteries (Messrs. W. M. Philips and A. W. Brown) have prepared a report on the probable initial cost of building and maintaining a college in North Staffordshire. The report states that the municipal divisions of the Potteries have compelled each town to make provision on its own account, and each technical institute erected has its own staff and works independently of the others. The joint reporters were of opinion that the proposed college should, in the first instance, aim at supplementing the work of the institutes by giving instruction in those directions in which they were unable to make any provision. The directions in which development seemed to be demanded were connected with the pottery and mining industries, with the training of pupil teachers, and with the consolidation and advancement of University extension work. Their estimates of the cost of building and maintaining a college, embracing in the first instance these departments alone, were—(a) Buildings—Department of mines, 4,000*l.*; school of pottery, 4,000*l.*; training department, 6,000*l.*; general offices and

lecture-rooms (according to work undertaken), 3,000*l.* to 7,000*l.*; fitting and furnishing, 3,000*l.* to 4,000*l.*; total, 20,000*l.* to 25,000*l.* The possible income from various sources was—North Staffordshire Mining Institute, 4,000*l.*; training authority, 6,000*l.*; grants from the County Council, 3,500*l.* to 4,750*l.*; voluntary subscriptions, 6,750*l.* to 10,250*l.*; total, 20,000*l.* to 25,000*l.* (b) Cost of maintenance—Initial salaries of staff:—Principal, 500*l.*; lecturers in chemistry, ceramics, mining, physics, mathematics and languages, ranging from 400*l.* to 200*l.*; lectures in geology, 50*l.*—2,250*l.* This staff consisted only of those who were necessary to supplement existing teaching in the district, and in the event of rapid growth of the college further expenditure would be necessary. If a training department for teachers, apart from a pupil-teachers' centre, was established, an additional 950*l.* for salaries would be required, but the cost of this department would be maintained out of the Government grants, supplemented by those of the local authority. The maintenance expenses, laboratories, rates, taxes, lighting, heating, &c., would be 790*l.*, and the cost of office and organisation would be 326*l.* The approximate cost of the maintenance of the college would therefore be 3,500*l.* a year. The income from fees, grants, &c., was estimated at 1,200*l.*, leaving to be raised by grants from the local authorities and from other sources the annual sum of 2,300*l.* It was hoped that the school of pottery, in addition to training men, would act as a central advisory and analytical department for the manufacturers.

### REPAYMENT OF LOANS FOR BUILDING.

The report of the Select Committee on Repayment of Loans by Local Authorities has the following observations on rehousing:—

The contention of local authorities is that they must rehouse a large proportion of those whom they displace upon sites in the very part of their district in which land is most valuable; that if they are to rehouse the actual people whom they dispossess they cannot charge them rents higher than those which they have been accustomed to pay for their slum dwellings; that they have reduced to the lowest figure, consistent with substantial and sanitary construction, the cost of building; that they are working at a loss and that they are consequently confronted with the alternative of either making good that loss

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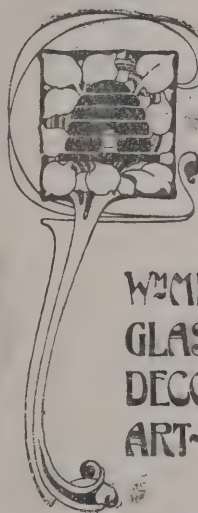
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annually out of the rates or reducing their sinking fund payments by obtaining an extension of the periods for replacement; that, in other words, they are compelled to ask for a contribution in aid of their rehousing schemes, either from the present ratepayers or from more remote future generations. The witnesses who have appeared on behalf of municipal authorities have expressed a preference for the latter alternative, and they have urged in justification of that preference that future generations will receive from their schemes both a valuable tangible asset and incalculable intangible benefits in the improved health and morals of the people.

The committee do not wish to express any opinion as to the economical character of municipal building operations, but they think that the manner in which the profit and loss account of rehousing schemes is in many places presented is calculated to convey a wrong impression as to the annual charge upon the rates arising from these schemes. Interest and sinking-fund payments on the whole amount given for the insanitary area or buildings, or expended upon demolition, are often charged against the rehousing scheme. It appears to the committee that the capital charges against the rehousing part of a scheme under Parts I. or II. of the Act should be only interest and sinking-fund charges in respect of that part of the total loan raised which is rightly attributable to the cost of building the houses and to the housing value of their sites, *i.e.* the price which such sites would fetch in the market if sold, subject to a covenant to build upon them workmen's dwellings. The rest of the loan should be regarded as expended on a sanitary improvement and repaid in a period not exceeding 60 years.

Another point in the profit and loss account which is very material in the consideration of the question whether relief should be given in respect of sinking fund charges is the scale of rents charged for the new tenements. It is obvious that if the rents charged are unreasonably low there will be a loss upon the scheme, even if repayment of loans is altogether dispensed with. Assuming it to be necessary to charge less than a commercial rent for their new accommodation in the case of those who have actually been compulsorily displaced, and have not received compensation under the provisions for that purpose, the committee consider that in all other cases the rent should be such as is commanded by similar accommodation in the district. To adopt any other scale must lead to great difficulty in selecting the tenants of these exceptionally low-rented tenements, and to a serious reduction of the supply of houses by private enterprise.

The committee further suggest that the amount allowed in these accounts for repairs and renewals should not be based upon the probable cost of repairs during the earlier years of the currency of the loan when the houses are new, but upon the probable average annual cost during the whole period.

A period for repayment which would, in the opinion of the committee, be just both to the present and the future, could be arrived at in the case of that portion of each loan which is required strictly for rehousing, if the points dealt with in paragraphs 65, 66 and 67 were attended to in submitting to the sanctioning authority estimates as to the probable financial results of the scheme. They recommend that estimates so framed should in every case be required and examined, and that the period assigned for the repayment of that portion of the loan should be subject to an absolute maximum of eighty years.

#### *Housing under Part III.*

It has been represented to the committee that local authorities are placed at a disadvantage as compared with their private competitors in housing undertakings by the fact that they are compelled to repay their housing loans within the periods at present allowed.

The statutory maximum periods are sixty years in England and Ireland and thirty years in Scotland. The committee see no reason for the exceptional treatment of Scotland in this matter. It should also be observed that under the Housing of the Working Classes Act, 1890, the money advanced by the Public Works Loans Commissioners to building societies or individuals for housing purposes must be repaid in a period not exceeding fifty years.

In the Metropolis, if the County Council borrows for housing purposes, or if the metropolitan boroughs obtain their housing loans from that Council, the full maximum term for repayment of the whole loan is obtained. This is apparently the result of the fact that sixty years is the period assigned for redemption by the London County Council (Money) Acts which have been passed with the assent of the Treasury.

If the metropolitan boroughs were to borrow for housing from any other source than the county council they would be subject to the more stringent limitations placed on the repayment of loans formerly raised by vestries.

In England outside the Metropolis, and in Ireland, the English and Irish Local Government Boards respectively fix within the limit of sixty years the period for the repayment of

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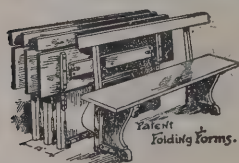
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each loan raised under the general Acts dealing with the matter.

In practice these boards usually allow 60 years in the case of loans for land and 40 years for buildings.

In allowing 40 years for buildings the boards apply that term not merely to bricks and mortar and other material of long life, but also to a variety of items many of which are from the outset, or may by ordinary wear and tear speedily become short-lived; the amount of these items not infrequently equals a considerable proportion of the cost of the outer shell.

Under the annuity system the amounts required to be paid each year to extinguish a 3 per cent. loan in 40 and 60 years are equal to an annual payment of 4.33 per cent. and 3.61 per cent. respectively upon the amount of the loan. Private enterprise would hardly enter into building operations which did not show a margin of receipts over working expenses amounting to larger percentages than these upon the money invested. It appears, therefore, to the committee that municipal builders are not hampered in their competition with other builders by the present conditions of repayment under which their capital is raised.

It has, however, been urged upon the committee on behalf of the local authorities that the capital required in the case of their houses is greater than in the case of houses erected by private enterprise, because of the high standard of excellence which is enforced in regard to their building operations by public opinion and by the requirements of the public departments. Several instances in which it is alleged that such requirements were unreasonable have been brought to the notice of the committee, but it has not been proved in any case that those requirements exceeded the standard which ought to be enforced by building by-laws upon all builders, public or private.

The municipal witnesses have suggested to the committee various periods as being, in the opinion of the local authorities which they represented or of housing conferences, appropriate for the repayment of loans raised for housing undertakings.

Some of these witnesses expressed the opinion that loans for the purchase of sites for houses should not be required to be repaid at all, but that such sites should be regarded as liquid assets against the debt, because it would always be possible to resell them for the sum, or more than the sum, given for them by the local authority.

The opinion more generally expressed was that sums borrowed for such sites should be repaid within 100 years. In view of the fact already referred to that the policy of Parlia-

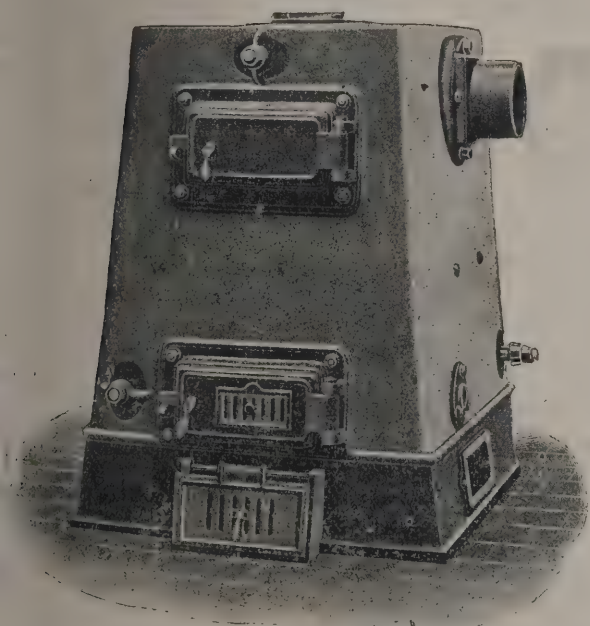
ment has always been to prevent the creation under general Acts of a permanent debt by local authorities, the committee think that the latter opinion is the more reasonable one, and proceed to discuss it.

It must be remarked in the first place that the extension from 60 to 100 years of the period for site loans is not one which is of very great financial importance to present ratepayers. Such sites in the case of housing, as distinct from rehousing, can be, and generally are, selected upon the outskirts of the town, and the price paid for them does not usually represent a very large proportion of the total cost of the scheme. If a 3 per cent. basis and the annuity system of repayment are adopted, it will be found that the suggested extension would only mean to present ratepayers an annual saving of 9s upon every 100l. of the sum given for the site.

On the other hand, the extension would mean to future generations a very considerable increase of the risk they are called upon to undertake, *i.e.* the risk of finding themselves, owing to migration of population or other causes, possessed of land for which, if they wish to sell it, they cannot obtain a price equal to the amount of the charges in respect of its acquisition still remaining upon it, and for which, if they retain it, they are compelled if the annuity system of repayment has been adopted, to make precisely the same annual sinking-fund payments as those which were made by their predecessors whose representatives undertook the enterprise for which the land was required and selected the site.

The committee, however, realise that this risk may be very greatly diminished by the adoption of the instalment system of repayment. Under that system a far larger portion of the capital borrowed is repaid in the earlier years of the loan period than under the annuity system; and the committee think it improbable that, even if the period for repayment of loans raised for the purchase of sites for dwelling-houses was somewhat extended, such land, if judiciously purchased, would often become during the currency of the loan worth less than the amount of the debt upon it, which, under that system, was still unpaid.

Some witnesses have represented to the committee that a distinction may be drawn between the land acquired by local authorities for the erection of dwelling-houses and that purchased for other purposes. The committee think that there is some substance in this representation. Suitable land for dwelling-houses is more likely, on account of its position, to retain its value than sites of sewage works, or lands for water



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supply; it can more easily be resold than land on which a public building has been erected, or which has been thrown into a street; its resale would not provoke the same opposition as that of a public park or recreation ground; in other words, it forms a more liquid asset to meet debt than any other land purchased by local authorities.

After full consideration of all the financial and other arguments on the subject which have been placed before them, the committee are prepared to recommend that, subject to the acceptance of the instalment system of repayment, the maximum period allowed in the case of loans under Part III. of the Act of 1890 for sites for dwelling-houses should be extended to eighty years, provided that the fixing of the exact period within that maximum for each of such loans is left to be decided by the sanctioning authority after consideration of the situation of the land, the price given for it and all the circumstances of the locality.

It appears from the evidence that the statutory maximum of 60 years for the repayment of loans for building operations under Part III. would, if made applicable to the whole of the United Kingdom, meet the views of most of the witnesses who have appeared before the committee to represent the councils of extra-metropolitan cities and boroughs, but Lord Welby, speaking on behalf of the London County Council, expressed the opinion that this maximum term should be increased in the case of such loans—if raised by that Council—to 100 years.

The committee recognise that there are certain considerations with regard to the Metropolis which may justify the preferential position in which the London County Council is placed by being able to obtain in all cases sixty years for the repayment of money borrowed for housing purposes, but they consider that even in the metropolitan area, and with regard to the building operations of the London County Council, a period of sixty years, which is generally considered as equivalent to the lives of two generations, is the longest term which can properly be allowed for the repayment of loans raised for the erection of artisans' dwellings under Part III. of the Act.

The committee have next to consider whether there should be any modification of the present practice of the departments in fixing, when it is their duty to do so, the actual term for the repayment of a building loan.

The department charged with this duty should in each case take into consideration not only the question of how long the buildings which are to be erected will remain in existence as dwellings, but also the question of how long the effective

demand for dwellings of the proposed type in the proposed position will continue.

It is obvious that an answer to the first question can only be arrived at after a careful consideration of plans and specifications, and may then be rendered wholly incorrect by matters over which the Department has no control, e.g., bad workmanship or insufficient attention to periodical repair.

The answer to the second question must be an effort of prophecy, based on a knowledge of the particular locality and a study of the migrations of population which have taken place and their causes. The steady advance in the type of accommodation required by the working classes and the probable effect of improved facilities for locomotion upon the distribution of population must also be borne in mind.

Every witness who appeared before the committee to represent a particular locality was not unnaturally inclined to the opinion that the population of that locality must in future rather increase than decrease. On the other hand, the committee have received evidence of considerable decreases of population in other localities which may have arisen either from temporary or permanent causes.

In view of the infinite variety in the manner in which the questions mentioned above must be answered, in considering the application of different authorities for sanction to borrow money for different building schemes, the committee do not think that any one period for repayment can be decided upon which would be universally appropriate.

The committee are not prepared to say that the period of forty years usually allowed by the departments concerned is either too long or too short in all cases.

If the departments had the power either to insist upon the adoption of the instalment system for repayment, or to secure by audit the maintenance of adequate provision for repair, the committee would consider, in the case of these loans, that the periods usually granted are too short, but they cannot adopt that general view in the present state of the law upon the subject.

If, as the committee believe to be the case, all the circumstances of the locality are considered in deciding upon each application, and the scale of periods allowed in respect of each of the groups of items which make up the total cost of a building is periodically reviewed with due regard to the improvements introduced into building operations, the committee consider that the departments may be relied upon to do substantial justice in fixing the periods for repayment.

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# The Architect.

## THE WEEK.

IT was said by Captain WELLS, the chief officer of the Metropolitan Fire Brigade, at the inquest concerning the Queen Victoria Street fire on Monday, that if one of the firemen had known the geography of the building lives might have been saved. The words are enough to suggest the wisdom of the edict which was issued in the time of LOUIS XIV. in Paris, and by which it was ordered that all the master masons, carpenters, tilers, or roof-coverers should give their names to the commissaries of the various districts of the city in order that they might be available when their services were demanded on occasions when fire broke out. Heavy penalties were inflicted on all who attempted to evade their obligations. It was realised that those men were acquainted with the planning of the old timber houses which stood in the narrow streets of Paris, and in cases of emergency would instinctively arrive at the nooks and corners in which the terrified inmates would seek shelter. The modern firemen are mainly derived from sailors, and there is no doubt about their courage and activity; but as, from their past experience, they can know very little about the disposition of the parts of houses, they are in a difficulty when they have to combat the flames in so complicated a series of buildings as formed the theatre of the tragedy in Queen Victoria Street. Captain WELLS said he was in favour of such an amendment of the London Building Act as would insure proper structural access to all buildings, and where there is a deficiency in geographical knowledge that arrangement would be an advantage.

THE majority of the buildings throughout the country in which minor civil actions are heard and criminal cases are tried have not the qualities which impress people with a belief that much respect is given by us to justice. They are generally badly arranged, insufficiently lighted, and with ineffective ventilation. In many towns they were erected at a time when architecture appears to have been unknown. A day spent in one of the courts is enough to fatigue the strongest lawyer. The local authorities are supposed to be responsible for the buildings, but the expenses of improvements they wish to cast upon the State, while the State repudiates all liability. The decisive action taken by Judge EMDEN in regard to the Tunbridge Wells court-house on Monday may have the effect of drawing attention to a widely-felt grievance. He has come to the resolution that whenever a long and important case has to be heard he will abandon the Tunbridge Wells court in favour of the Tonbridge court, which is four or five miles distant. His Honour has endeavoured during a number of years to convince the Town Council about the necessity of building a new court-house, for, as he believes, it is absolutely impossible for justice to be administered in a room so ill adapted to suggest the majesty of law. But the magistrates have lately passed a resolution declaring that a new court-house was not required, although it was allowed that alterations were called for. Judge EMDEN maintains that alterations would only be a waste of ratepayers' money. A street runs along one side of the building; if the windows are open the noise is deafening and distracts, if they are closed the heat is unbearable. The Tunbridge Wells court-house is, however, no more than a sample of a great many others in all parts of the country.

SOME arrangements have been settled about the restoration of Portsmouth parish church. The urgent repairs of a structural kind in the chancel will be carried out at the expense of Winchester College. The floor will be left unconcreted and ready for the replacing of the pews. Whether the old plaster will be restored or not has yet to be determined, but the vicar will be content if the walls are allowed to remain as they are. It is not a matter of urgency whether the reredos should be replaced. At present as the choir vestry the tower entrance is used, and it will therefore be necessary to add a new choir vestry. The treatment of the nave does not rest with Winchester College. The general opinion is that owing to former interments the subsoil is in an unsanitary condition. The

offensive smells are, however, ascribed by some people to decaying wood. Investigation and a prompt decision are undoubtedly called for. The most difficult of all the questions is the treatment of the pews. For the sake of the children, who according to the vicar have the same rights as adults, he claims the lowering of the pews as indispensable. Moreover, the pews are uncomfortable and of an obsolete type. The free seats and side seats are, on account of the pews, found in places which do not suggest equality among worshippers. At present gas lamps are alone relied on for warming the building, and in damp weather the church is unfitted for services; there is no system of ventilation. The parishioners appear to be unanimous about heating, ventilation and lighting. But the reseating is only approved by a minority. There is a Corporation pew which is held to be sacred, and if it should be touched there is a probability that the vicar of Portsmouth will cease to be mayor's chaplain. It seems childish that such prejudices should exercise any influence in an old parish church; but in all questions of privilege English local authorities are ready to find quarrel in a straw, and to sacrifice momentous interests to their own dignity.

THE international boat race which took place this week on the river Lee has drawn several visitors to Cork. They are not likely to fail to visit the exhibition which is now open, but there are so many rival attractions they may overlook the fine art section, which is one of the most interesting of all. Owing in a large measure to the labours of Mr. ARTHUR HILL, architect, a very important collection of pictures and drawings has been secured. The English corporations, the Board of Education, the Royal Academy, the Society of Arts, and many painters and sculptors have generously lent examples, and the monetary value is very large. They are insured for nearly 70,000/. It is satisfactory to find examples by MACLISE, who was born in Cork in 1806, and whose reputation is still upheld in the city. Another native artist is ADAM BUCK, who in 1811 brought out a collection of 100 Greek vases, drawn and engraved by himself. He exhibited in the Royal Academy between 1795 and 1833. NATHANIEL GROGAN deserves to be remembered, for he published views in the neighbourhood of Cork, and depicted such scenes as *An Irish Fair* and *An Irish Wake*. The English paintings are far more numerous and of a higher class than those by Irish artists. But this is explained by recollecting the difference in the support which is obtainable by artists in the two countries. There are several models of sculpture by JOHN HOGAN, who, if not a native of Cork, went there in his tenth year, and in his early days as an artist received support from Sir THOMAS DEANE, the architect, in whose office he acted as draughtsman.

THE importance of a railway as a factor in everyday life is never fully appreciated until there is some stoppage of the traffic. The appearance of a crack in a tunnel on the South-Eastern Railway between Grove Park and Chislehurst has made it necessary to divert the trains, and it would be difficult to estimate the inconvenience which has followed. The working of the line is the subject of constant and adverse criticism, but the changes of route, which have been unavoidable and which affect a very large area, can hardly be ascribed to the present management. Settlements in buildings and other structures have become so common, it should excite no surprise that a brick tunnel which dates from 1865 requires shoring, and, it may be, reconstruction. It has been found necessary to widen the line, and a new tunnel was therefore formed parallel to the old one. The operations may have caused sufficient disturbance of the earth to account for the cracks. The prompt action of the directors has prevented a fall of brickwork that on so busy a line might have resulted in a deplorable loss of life. The tunnel is over 2,000 feet in length, and will require to be scrutinised before the traffic can be again allowed to pass through it. At present the arch is secured by means of timber lining. It may be possible to overcome the danger by a removal of the parts which have shown signs of weakness. But a brick tunnel sometimes becomes as united as a casting, and injuries to the construction are rarely confined to one part, but in a greater or less degree affect the entire work.





PAINTERS' ARCHITECTURE: CLAUDE LORRAINE.

## LIVERPOOL CATHEDRAL COMPETITION.

THE contents of the portfolios submitted by architects in the preliminary stage of this competition are on exhibition this week, and fill three of the large rooms of the Walker Art Gallery. Each set is carefully grouped, and provided with a distinguishing number. A by no means successful attempt has been made to prevent identification by pinning a card over authors' names, the presumption being that neither the committee nor the assessors shall know whose work they are examining when making their award. The precaution is, however, superfluous, as much of the work has been previously published, and is consequently well known.

MESSRS. BASIL CHAMPNEYS, AUSTIN & PALEY, W. D. CARÖE, SIR THOMAS DREW, CRAM, GOODHUE & FERGUSON, of Boston, U.S.A., and W. H. BIDLAKE, among others, are represented merely by photographs and drawings of executed work, much of which is very excellent, but in no case exceeds in importance that of a large church.

The chief interest of the exhibition is supplied by those architects who have had the courage to prepare special designs for a cathedral, and make an attempt to strike out from the beaten track of the old Gothic plan of the square tower at the crossing. In practically all of these the form adopted is the octagon. One exception, however, must be noted—a very original interior based on the hexagon.

The finish of these central features is in most cases by means of the dome, doubtless from the fear of dwarfing the other parts by the great height and bulk of a tower or spire termination. In no case, however, is the effect thoroughly happy. All bear the appearance of a fruitless struggle to give Gothic character to a shape which is evidently unsuitable, and are simply Byzantine or Renaissance domes masquerading in Gothic trimmings.

The threatened Byzantine revival is not so largely evidenced as might have been expected. There is, however, one design which deserves more than passing notice. Renaissance is but poorly represented, and the advanced school has contributed one example of weird originality which is an object lesson in what not to do.

Viewed generally, much of the work is ambitious and incompetent; but this is in a measure atoned for by other examples of more than ordinary merit, ably designed and well illustrated.

In No. 46 the main feature is a large octagonal central dome, with flanking towers on the four corners finished with spires, a central *fleche* to the dome, and two western towers also finished with spires, making seven in all, which are very similar both in treatment, size and elevation. The design thus lacks a really dominant feature, the author having evidently endeavoured to subdue the dome by carrying the corner towers above its springing line, and emphasising them at the expense of the western towers, which are brached at a lower level. One strong merit of this design is the manner in which these flanking towers act

as buttresses to the dome, and carry the central structure down to earth. Another is the provision of direct lighting at the ground level through the corner towers to the centre of the crossing, which also gives a vista terminated by a window through each arch of the octagon.

No. 84 has in plan practically the same arrangement, the similarity being very striking. The elevational treatment is, however, different; the corner towers are made subordinate to the central octagon, which has its angles strongly buttressed, with pinnacles rising above the broad of a lantern spire. This design is not sufficiently illustrated, there being only in addition to the plan one section through the nave showing external treatment of lantern and transepts.

No. 18 shows a fully-illustrated design which also has the octagonal plan for the central feature, finished in this case with a dome and flanking towers, but the towers stand free from the lantern, and consequently are not of service as buttresses. The west front is somewhat on the lines of Peterborough—with towers at either side—too far apart to form a satisfactory composition.

The west front of No. 28 is also reminiscent of this same example. The centre octagonal plan again appears. It is 82 feet in width, crossed by four arches in continuation of the lines of nave and transept arcades, which intersect and give a square in centre equal to the nave width. Upon this construction the author has had the temerity to poise a high square lantern tower, which looks distinctly dangerous.

No. 45 consists of a good set of drawings illustrating design for the "Cathedral Church of St. Paul." The centre feature is octagonal, or rather possibly a square with splayed corners. These are so short that the angles become a group of triple piers effectively treated. The church has double aisles, that adjoining the nave being very narrow, the consequence being the piers are brought very close together, two arcades separating the main aisle from the nave, where under ordinary conditions one would have sufficed. The architectural treatment is excellent, and the design throughout shows much ability. No. 45A is another study evidently from the same hand, and has the hexagon as the basis of its central arrangement, with small transepts opening from each of the double sides. This design also has much cleverness to recommend it, though the semi-vaulting of the hexagon with ribs spanning 83 feet, each of which is twice intersected in its sweep by similar ribs having a like span, and leaving an unvaulted centre hexagonal in shape and 48 feet wide, through which may be seen the lantern windows and the dome, is a doubtful piece of construction.

The lantern is topped with a dome, as are also the western towers, with the evident desire to bring them all into sympathy. The result does not convince, but rather tends to spoil an otherwise very able design.

(To be continued.)



## MODERN JOINERY.\*

AT no former time could it be said with more truth than in our days that "of the making of books there is no end." The reading of the titles of those which appear in a single week is not a slight task, and we suppose nobody but a trained librarian could remember them. Anyone who has attempted to classify the varieties of the 5,000 works which is the average annual output in this country will, however, acknowledge there is a deficiency of one kind. It is almost impossible to meet with a volume written by a genuine working man on his own trade. Many technical treatises are issued on trades and callings, but the compilers of them generally betray by their language that they have not gained the experience which is only to be derived from operations on the materials which are used in the business they describe. They may select a higher point of view than is attainable in the workshop, but on that account the writings are strange to regular operatives. This deficiency does not arise from any want of skill in expressing themselves among men who are employed in trades. Many of them can write well, but their thoughts are turned in another direction. They wish apparently to show their capability for governing nobler spirits than themselves, and to ministers and administrators *in posse* the everyday details of the workshop must be insignificant. There is, of course, an excuse for their indifference. It does not take a man long to realise that the advancement in the social scale on which high and low set their hearts is not to be gained by manual dexterity. Other qualities are found to be more advantageous. The result is that not only is there an absence of books by workmen for workmen, but in nearly all the handicrafts there is a decline of interest among those who take part in them, and men are less proud of their work than formerly.

To those who have studied this aspect of the question of labour such a volume as "Practical Joinery," by Mr. GEORGE ELLIS, will have a peculiar value, unlike that of the majority of books on construction. He is a certified carpenter, whatever that may mean, and an instructor in joinery to a training school. But what, in our eyes, is far more important in qualifying him for authorship is that he has "practised the craft in all its branches for upwards of twenty-five years." It is also satisfactory to know that he does not attempt to furnish a text-book in the narrower acceptance of the term; or, in other words, he does not profess to show a short and easy way for the attainment of certificates which are of little value, or to enable readers to teach carpentry after once going through the pages, although the author at other times offers to train candidates for examination either personally or by correspondence.

Like so many of the terms used in trades the word joinery is only partially expressive. Joining is an almost universal need, for nearly every production consists of several pieces skilfully put together. Even the sculptor cannot always make his statue out of a single block of marble or obtain his bronze figure by one casting. Skill in construction is in a measure the ability to make suitable joints. Mr. ELLIS's definition of joinery as "the art of preparing, constructing and fixing the internal and external wood fittings of a building, as distinguished from carpentry, which in like manner deals with constructive woodwork," is only explicit to those who are acquainted with the modern system of production. Engineering contractors employ men for whom fittings, which are generally taken as ornamental forms, have no importance, but in building work it is not always easy to distinguish between carpentry and joinery, and in country towns, if not in large London workshops, workmen undertake both with almost equal readiness. The difference between the two is suggested by one being paid for by the cubic foot and the other by the superficial foot, but often it means no more in a workman's eyes than the possession of tools. For joinery a more numerous assortment is demanded than for carpentry, and while one workman is proud of having wealth in a variety of tools, there are others who contrive to get through with very few aids, and those not always of the best. The use of tools is

described clearly by Mr. ELLIS; but in all operations relating to joinery the best way of acquiring skill is not by reading, but through mistakes which bring forth the sarcasm of those who are dexterous. The important subject of joints is also treated. After classifying them as glued joints, dry joints, angle joints, framing joints and shutting joints, it is necessary to add miscellaneous joints, comprising "various joints and connections in use for special purposes, and not coming under either of the above descriptions." The fact is, so many joints can be formed it is not easy to fix them all in a few divisions.

The several classes of work on which joiners are engaged are treated in succession, such as doors, gates, door framings, windows, shutters, shop fronts and fittings, airtight casework, fittings for banks, museums, libraries and churches; shaped, curved and bevelled work, stair building, hand railing, moulding. There are also chapters on timber, woods used in joinery, and a glossary of terms and phrases connected with joinery. Throughout we see indications that the author has some of the old-fashioned pride in work when properly executed. Thus kerfing is condemned as "a very crude and inferior method of obtaining a curved surface, discreditable alike to the workman's skill and his ingenuity; there is neither beauty in the curve or strength in the work." We also find Mr. ELLIS contrasting the fittings during the reigns of the last HENRYS, MARY and ELIZABETH, when the art of joinery was evolved, and the often "meaningless assemblage of hollows and rounds that do duty for mouldings in our own times, thanks mainly to the exigencies of machine production." In the chapter on foremen's duties, in which information is given about drawings and the setting out of work, we have the following remarks, which suggest some of the deficiencies which cause dissatisfaction:—

Methods of setting out vary in different shops, unfortunately, both for employer and workman, tending much to the pecuniary loss of the former and the mental distraction of the latter. In one, the "rods" will be set out loosely, sections varying and requiring "allowances" to be made by the workman; in another they will be literal copies of the "plans," no discretion being used in the translation, with the result that the various parts of the construction will not "dovetail." Implicit reliance cannot be placed on "working drawings." Errors in construction creep in sometimes in the original, and more often in the tracing, which it is the duty of the intelligent foreman to eliminate. He should be able to distinguish between what is essential, as conveyed by the whole tenor of the specification, and what is merely suggestive. It must be remembered that the architect is not versed in the constructive details; he is a designer, not a craftsman, and his drawings are made to indicate more fully and clearly than can be conveyed in the specification what it is that he requires. To determine the correct way of attaining the desired result is the duty of the foreman. Sundry deviations from given dimensions may be necessary to bring the work within marked sizes, &c., or to compensate for some authorised alteration. No definite rule can be laid down; common sense must dictate when it is necessary to apply for authority to make some alteration. A third method of setting out, and this is the one we offer as an example for the embryo foreman to copy, is to set the rod out to the "tried up" sizes of the stuff—that is, the size the material is after having been planed up—and to make some allowances for fitting and fixing, not upon the rod, but on the material. This will do away with the necessity of the workman making allowances, which is a fruitful source of error.

We do not anticipate that working joiners will undergo the sacrifice of the twelve shillings required for the purchase of Mr. ELLIS's treatise, with the exception of those who aspire to be clerks of works or foremen. The latter are allowed the privilege of a monopoly of thinking by their fellow-workmen, and may be disposed to discover the reasons which determine the production of various kinds of work. We believe the volume will be of the greatest use to students of a different class, viz. to those who have taken up architecture and quantity surveying. It is no ephemeral publication, for it has the best of claims to be called practical, and information will be found in the pages which is not obtainable in the ordinary professional books on work in wood. The glossary at the end with its workmen's terminology is one instance. In every case the author says he has relied upon his own experience, and that is a recommendation which does not customarily belong to technical treatises.

\* *Modern Practical Joinery: A Treatise on the Practice of Joiner's Work by Hand and Machine.* By George Ellis. (London: B. T. Batsford.)



## ROYAL INSTITUTE OF BRITISH ARCHITECTS.

## The Midsummer Examinations.

## Preliminary.

THE preliminary examination, qualifying for registration as Probationer R.I.B.A., was held in London and the various non-metropolitan centres indicated below on the 10th and 11th ult. Of the 207 candidates admitted, 40, having furnished satisfactory evidence of their attainments, were exempted from sitting. The remaining 167 sat for the examination, with the following results:—

	Passed.	Relegated.	Total.
London . . . . .	67	23	87
Birmingham . . . . .	8	—	8
Bristol . . . . .	9	—	9
Exeter . . . . .	5	—	5
Leeds . . . . .	15	2	17
Manchester . . . . .	24	3	27
Glasgow . . . . .	4	1	5
Newcastle . . . . .	8	1	9
	140	27	167

The passed candidates, with those exempted—numbering altogether 180—have been registered as probationers. The following are their names and addresses:—

H. E. Adams, London; D. M. Addis, Edinburgh; J. Allner, Manchester; J. E. Bailey, Bushy Heath, Herts; D. Bamford, Manchester; T. M. Banks, Darlington; R. F. Bargman, Dorking; W. J. Barnsley, Walsall; J. Baxendale, Bolton; H. A. Beeston, Dover; G. A. Bell, Leicester; O. P. Bevan, Bridgend, Glam.; W. G. Blakey, Sunderland; H. Booth, Leeds; G. P. Boyd, Berwick-on-Tweed; J. Boyd, Oldham; T. A. D'A. Braddell, London; A. V. Bramble, Emsworth, Hants; P. S. Brenton, Weston, Bath; G. B. Bridgman, London; W. J. Brough, London; E. M. Browett, Wolverhampton; E. O. Brown, Christchurch, Hants; J. C. Bucknill, B.A., London; R. G. Burrow, Manchester; J. S. Cable, London; G. J. Calder, London; H. J. Chetwood, Felsted, Essex; D. J. Chisholm, Edinburgh; C. W. Christian, Leicester; H. W. Clapson, London; G. L. P. B. Cockrell, Manchester; V. Constable, Glasgow; W. H. Cooksley, Pontyclun, R.S.O., Glam.; C. Cooper, Blackburn; R. T. Cooper, Twickenham, Middlesex; H. J. Copley, Gainsborough; S. H. Corner, Portsmouth; W. N. Couldrey, Bristol; J. L. Coverdale, Whitby, Yorks; C. G. Cowlshaw, Stoke-on-Trent; H. Cox, London; O. R. Dawes, Leeds; P. Dawson, Liverpool; R. Duckett, Preston; G. M. Dunn, Shortlands, Kent; F. H. Durant, Leighton, Essex; H. Edmonds, Kidderminster; W. H. Ellison, Barnsley; J. R. Fairbairn, London; W. Fawcner, Macclesfield; G. Field, Eastbourne; H. T. Field, Hull; E. Finn, Canterbury; T. W. Fullerton, London; C. G. Fullford, Salisbury; H. E. Gelder, Hull, Yorks; J. G. Gibbons, Birmingham; G. E. Gibson, Newcastle-on-Tyne; G. B. Gilliat-Smith, Bruges, Belgium; H. H. Golding, London; A. Grimoldby, Hull; J. C. Guillet, London; H. M. Gundry, London; W. J. Halls, Exeter; A. R. Hamilton, Henley-on-Thames; A. A. Hands, London; D. B. Hart, London; H. L. Hicks, Newcastle-on-Tyne; A. Hill, Huddersfield; H. C. Hollis, London; R. T. Holman, Topsham; H. L. Honeyman, Glasgow; G. J. F. Hookway, London; B. B. Hooper, London; F. B. Hooper, High Wycombe; T. Hudson, Bolton, Lancs; H. W. Humphry, Bournemouth West; S. H. H. Ixer, London; R. O. Jackman, London; B. V. Jackson, Birmingham; J. M. James, Weston-super-Mare; G. W. Jarrett, London; H. L. Jenkins, London; D. B. Jenkinson, Rotherham; G. A. Johnson, London; W. A. Johnson, Manchester; W. H. Johnson, Wigan; C. T. Jones, London; R. A. S. Jones, London; W. I. Keir, Bath; R. C. Kennard, Northampton; P. E. Kennedy, Morpeth, Northumberland; A. G. Kiralfy, London; C. W. Kirkham, Bolton; W. Langcake, Sheffield; W. C. Lemaitre, London; H. Lidbetter, Carlisle; R. B. Ling, London; W. A. Mackay, Ilford; S. A. H. Mackey, Warrington; M. R. Martin, London; P. May, London; J. R. Mead, Burton-on-Trent; W. L. Mellor, Halifax; A. C. Meston, Aberdeen; C. A. L. Morant, Bristol; L. Morgan, London; L. W. Myers, Cambridge; L. Nagington, Liverpool; H. Nuttall, Oldham; C. Oldrey, Bedford; B. W. Oliver, Barnstaple; W. M. Oliver, Newcastle-upon-Tyne; R. W. Orme, Oldham; F. J. Osborne, Birmingham; W. Overton, Sutton; G. F. Paget, Gainsborough; J. Pearce, Exeter; H. M. Pett, Brighton; J. A. Pirie, Inverness; T. C. Pope, London; W. Pritchard, Lancaster; C. L. Reinmann, St. Leonards-on-Sea; N. A. Rew, Great Berkhamsted; C. K. Richardson, Wakefield; N. B. Robertson, Leicester; G. G. Rogers, London; G. H. Rowledge, Manchester; P. W. G. Rudhall, Brighton; F. G. Russell, London; E. S. Ruthen, Cardiff; A. L. W. Sampson, Redhill; H. Sandford, Gravesend, Kent; H. F. Saxelbye, Hull; C. W. Sayer, London; H. R. Sayer, London; T. E.

Scammell, Bristol; N. Scott, West Hartlepool; T. H. Sheldermine, Liverpool; H. R. S. Shires, Plymouth; G. G. Sigismund, Billingshurst; S. Simons, London; A. G. Sladdin, Brighouse, Yorks; A. F. Slaughter, Reading; C. B. Smith, Ipswich; D. L. Solomon, London; C. A. Stanley, Tring; G. H. Stelfox, Manchester; D. W. Stewart, London; A. Sunderland, Keighley, Yorks; B. H. Sutton, Lower Basildon, near Reading; F. S. Swash, Newport, Mon.; W. W. Tipton, Wellington, Salop; H. M. O. Travers, Norwich; C. P. Wade, Yoxford, Suffolk; F. W. Walker, Gravesend; H. D. Ward, Hastings; V. Ware, Bournemouth; H. G. Warlow, Sharrow, Sheffield; F. J. Watson, Forest Gate, Essex; J. D. D. Watt, Falkirk, N.B.; F. N. Weightmann, Newcastle-upon-Tyne; A. Wilby, Barnsley; O. Whittaker, Heaton, Bolton; A. W. Wilkinson, Tyne-mouth; J. B. Wills, Clifton; T. T. Wills, Portishead, Somerset; J. Wilson, Edinburgh; J. A. Wilson, Glasgow; C. C. A. H. Withers, London; G. Wittet, Edinburgh; E. M. Wood, Halifax, Yorks; E. V. Wood, Forest Gate, Essex; W. H. Wood, Stoke-on-Trent; F. Woods, Maidenhead; H. T. Woolfall, Blackburn, Lancs; H. Wormald, Leeds; W. Wright Brading, Isle of Wight; H. J. Wyatt, Rabato, Malta.

## Intermediate.

The Intermediate Examination, qualifying for registration as Student R.I.B.A., was held in London and the under-mentioned non-metropolitan centres on the 10th, 11th, 12th and 13th ult. Ninety-eight candidates were examined, with the following results:—

	Passed.	Relegated.	Total.
London . . . . .	36	34	70
Bristol . . . . .	6	2	8
Glasgow . . . . .	1	2	3
Leeds . . . . .	6	3	9
Manchester . . . . .	1	4	5
Newcastle . . . . .	1	2	3
	51	47	98

The passed candidates, who have been registered as students, are as follows, the names being given in order of merit as placed by the Board of Examiners:—

H. J. Ash, Willenhall, Staffordshire; A. C. Bosson, London; R. E. Stewardson, London; J. L. Fouracre, Plymouth; H. J. C. Marshall, London; G. A. Farrar, Huddersfield; F. G. Johnson, Risca, Newport; J. E. Braithwaite, Leeds; E. G. Allen, London; A. F. Benjamin, London; D. Mitchell, London; W. A. Hodges, London; F. W. Hayward, Minehead, Somerset; J. W. Walker, Aberdeen, N.B.; S. C. Ramsey, Sutton, Surrey; W. E. Watson, London; Miss B. Potts, Banbury; P. J. Westwood, Grays, Essex; N. Culley, Huddersfield; C. L. Gill, London; T. T. Sawday, Leicester; A. R. Powys, Somerset; W. T. Loveday, Banbury; F. Thorpe, Oldham; H. MacG. Bowes, London; R. W. Yates, Huddersfield; A. E. Brooker, London; H. F. Murrell, London; E. G. W. Souster, Northampton; L. M. Gotch, Kettering; E. E. B. Claypole, London; J. I. Tweedie, Annan, N.B.; W. W. Robinson, jun., Hereford; E. G. G. Bax, London; M. S. Briggs, Otley; W. A. T. Carter, London; H. E. Clifford, Watford, Herts; R. S. Dacombe, Southampton; W. R. Davison, Woldingham; G. T. Forrest, Wakefield; E. L. Haynes, St. Albans; A. R. Holman, Penarth; R. Huggup, jun., Glanton, R.S.O., Northumberland; N. T. Myers, Watford; P. C. Pilling, London; T. E. Richards, Barry; F. J. Robinson, Upper Weston, Bath; E. W. Slaughter, Windsor; H. R. G. S. Smallman, London; F. A. Sprules, Sutton, Surrey; F. G. Stockdale, London.

## Final and Special.

The final and special examinations, qualifying for candidature as Associate R.I.B.A., were held in London from the 11th to the 18th inst. Of the 73 candidates examined 46 passed. The successful candidates are as follows:—

G. W. Allsop, C. W. Beaumont, J. H. Belfrage, R. Berrill, W. Bevan, H. C. Bishop, E. D. Brown, R. P. Chamberlain, H. Chapman, jun., A. R. Conder, E. F. M. Elms, R. F. Farrar, J. H. Gibbons, T. H. Gibbs, T. S. Gregson, B. Greig, P. J. Groom, P. J. Haywood, W. H. Hobday, O. Holden, A. L. Holder, H. S. Jardine, I. M. Kent, R. G. Kirkby, H. Moger, W. J. Nash, C. F. Newcombe, P. C. Newman, W. C. Oman, E. O. Payne, W. S. Payne, R. McM. Roberts, A. R. Robertson, J. M. Ross, E. Simm, S. Smith, J. Swarbrick, G. Walker, C. F. Ward, L. F. Ward, C. W. F. Wheeler, T. W. Whipp, H. A. Wilson, R. G. Wilson, jun., D. Wood, W. Wrigley.

The number of failures in each subject of the final examination was as follows:—

I. Design . . . . .	23
II. Mouldings and ornament . . . . .	18
III. Building materials . . . . .	16
IV. Principles of hygiene . . . . .	10
V. Specifications . . . . .	8
VI. Construction, foundations, &c. . . . .	15
VII. Construction, iron and steel, &c. . . . .	16



## THE LATE MR. J. J. TALBOT.

THE very sudden and unexpected death of Mr. J. J. Talbot, of Liverpool, which occurred on the 20th of last month, removes from the ranks of architecture one of the names most prominently associated with the large scheme of employes' dwellings in connection with the works of Messrs. Lever Bros., Ltd., at Port Sunlight, Cheshire. Mr. Talbot, who was a native of Bolton, was born in August 1871, and was therefore still a young man. Shortly after starting business he entered into partnership with Mr. W. G. Wilson, and the work was carried on under the names of Wilson & Talbot, Commerce Court, Lord Street, Liverpool. Amongst the works carried out by the firm are many of the blocks of cottages referred to at Port Sunlight and the New Ferry Liberal Club on the same estate. A large portion of Mr. Talbot's business, however, consisted of domestic work of a more important character, including a number of private houses in the neighbourhood of Birkenhead. At the time of his death Mr. Talbot was engaged on extensive additions to Thornton Manor, Thornton Hough, Cheshire, for Mr. W. H. Lever, where he had practically a free hand. Amongst these additions a magnificent music-room and extensive stables were just approaching completion. A drawing in the present exhibition at the Royal Academy illustrates the Unitarian church, Birkenhead, at present in course of erection. He was a regular and successful exhibitor at the Academy. His architectural work was characterised by a very thorough and painstaking attention to every detail.

## VENTILATION OF THE HOUSE OF COMMONS.

EVIDENCE was given last week by Mr. Dick Peddie, architect, Edinburgh, before the select committee on the ventilation of the House of Commons. He said that he had made an examination of the existing arrangements, and had arrived at the conclusion that the ideal method would be to draw in the fresh air from above instead of from below, as at present. To supply sufficient ventilation for a full House it would be necessary under the present system to introduce air in such volume through the floor as to be uncomfortable to members; whilst, on the other hand, if the air were introduced from above, and extracted from below, there would be no discomfort to members, and better results would be obtained. At the same time, he did not think it would be wise to make any startling innovation upon the existing arrangements. There were certain defects which he thought could be easily remedied. For instance, he thought it would be possible to make the existing arrangements more certain and effective in their operation. In his opinion the air introduced into the chamber should be treated by means of steam pipes, and the existing fans should be altered.

## THE DESIGNS FOR THE LIVERPOOL CATHEDRAL.

THE effect on the lay mind of the drawings submitted in the preliminary competition for the Liverpool Cathedral can be judged from the following extract from the *Liverpool Courier*:-

The drawings exhibit great variety of style and merit. They are not all of ecclesiastical buildings, and only a comparatively small number of the competitors have made special designs for the St James's Mount fane. Whatever order of architecture the committee may prefer, there will be no difficulty in finding it on the walls, and they are offered equal latitude in the matter of cost. One apparently transatlantic designer will help us to the most stupendous cathedral in the world at the cost of a few millions. Others, who have their fingers on the pulse of Liverpool plutocrats, will provide at a more modest figure something neat and tasteful in the semblance of a Methodist meeting-house. As to style, you may have anything from bridecake Gothic to that which apes the affected primitiveness of Morris furniture. The peculiar uglinesses of modern American design are painfully apparent not only in elevations that have crossed the ocean but in British drawings—even our architects are being Americanised, of which Liverpool already has some portentous examples to show. There is nothing in our midst, as yet, however, to equal that remarkable design which an architect of enterprise has neatly inserted in the background of an enlarged photograph of St. James's Cemetery—a sprawling, shapeless shape which would be quite at home as a Saurian tabernacle in one of Mr. E. T. Reed's "Prehistoric Peeps." From the prospect of such an edifice the visitor turns with quite a new feeling of toleration to the mechanical prettinesses

of conventional Gothic or the Italianised platitudes of gentlemen who want to be classical, but either can't get Sir Christopher Wren out of their heads, or, if they do, provoke a lively sentiment of regret at their success.

If regarded merely as artistic productions, the drawings will be found to exhibit a pleasing diversity of technique, ranging from slight memoranda by architects who feel confident that their ideas need no elaborate embellishment to recommend them, to laborious sets of drawings in pen and ink or colour, which must have involved much thought and labour. Here and there one encounters a design treated pictorially. One tyro has washed his drawings down until they have quite an Impressionistic ghostliness; and another competitor, with a neat dramatic effectiveness, has introduced an approving ray of roseate light descending diagonally from heaven upon the roof of his hallowed pile.

The list of competing architects, as already stated, is long, but one fails to find in it several names without which no short list of our best ecclesiastical architects is complete. Perhaps this is the explanation of the undoubted fact that the feeling of a visitor after a first inspection of the exhibition is one of vague disappointment. Doubtless there are some clever designs, even a few that are exceptionally ingenious and effective, but the good things are thinly sprinkled among the many mediocre, even as the well-known and highly-esteemed names in the list are to be found here and there in a numerous company of the less distinguished. It is comforting to remember that the committee reserved to itself the right to invite gentlemen other than those who have joined the preliminary competition to send in plans in that which is to ensue. The committee has done its duty to obscure British architectural genius by giving any member of the profession an opportunity of entering the lists. It must now turn its attention to the far more important duty of securing for its constituents competitive plans by the best men of the day, thus insuring to the second city of the empire an ecclesiastical centre to which posterity may point with pleasure and pride as a monument of the wisdom and greatness of Liverpool in the beginning of the twentieth century.

The following is the official list of names of architects who have sent in portfolios of drawings in the preliminary competition. Their addresses the committee have resolved to withhold for the present:—

R. A. Briggs  
Rene Buyck  
Fred. H. Dudley  
E. Goldie  
J. Dale  
Albert C. Capronnier  
A. W. Crook  
Geo. Simmonds  
Geo. Taylor  
F. R. Kempson  
Hippolyte J. Blanc  
De Mathelin  
Basil Champneys  
W. J. Medcalf  
John Bloore, jun.  
R. W. Collier  
Austin & Paley  
W. D. Caröe  
W. J. H. Leverton  
A. Greothaert  
F. Billerey  
A. Colpoys Wood  
Sir Thomas Drew  
J. Brooks, Son & Godsell  
Robert W. Gibson  
J. Robertson  
Walter le Riele  
E. Dobbeleers  
C. H. Mileham  
F. M. Simpson  
Alph. Gosset  
— Grayson  
C. Demaeght  
G. P. D. Saul  
J. Oldrid Scott  
C. A. Nicholson  
H. A. Prothero  
W. H. Jewitt  
J. Coates Carter  
E. A. Heffer  
A. H. Skipworth  
F. H. & J. Sparrow  
J. A. Wilson  
Chas. L. Bell  
Cram, Goodhue & Ferguson  
Edouard Ramaekers  
B. Ingelow  
Colson, Farrer & Nisbett  
G. G. Scott  
C. V. Johnson  
G. H. Fellowes Prynne

Gerald C. Horsley  
F. Walley  
"Burgos"  
E. P. Warren  
W. Woodward  
Leonard Stokes  
J. F. Doyle  
G. & I. Steane  
S. O. Herbert  
G. Walesby Davis  
H. C. Corlette  
J. J. Creswell  
J. Jeffrey  
Beresford Pite  
J. Burnet & Son  
— M'Kenzie  
C. Spooner  
Murray & Murray  
H. Beecroft Downs  
J. Honeyman  
Eastwood & Greenslade  
Reed, Smart & Tappin  
P. A. Robson  
M. Metdepinningen  
W. H. Bidlake  
W. Mackay  
C. J. Anderson  
H. J. Price  
T. Th. J. Cuyper  
A. E. Street  
F. E. Butler  
F. Todd  
Jas. H. Cook  
C. E. Powell  
W. C. Bishop  
M. Stark  
H. B. Carre  
B. M. Ward  
W. R. Cleave  
H. K. Bromhead  
W. Boswell  
G. H. Shackie  
Max Sainsaulieu  
Temple Moore  
A. D. Sharp  
H. Wilson  
Reilly & Peach  
W. F. Tapper  
Goodwin S. Packer  
J. Atwood Slater



### THE DEVON AND EXETER ARCHITECTURAL SOCIETY.

ON Saturday last, July 19, the Devon and Exeter Architectural Society paid a visit to Truro as the guests of Mr. Silvanus Trevail, F.R.I.B.A. Their host met them at the station, where refreshments were duly provided at 9.30 A.M. Then a tour was made of the city. A careful inspection was made of the very interesting work now being carried out by Messrs. Relf & Son, of Plymouth, at the east of Truro station. The Victoria Gardens were visited on the way to the new municipal cattle market, and then on to Kenwyn Church, where the party was met by Archdeacon Cornish. From this point the best view is obtainable of Truro and its new cathedral. Among many other places of interest which were duly visited, mention may be made of the Royal Institution of Cornwall, the free library and county technical schools, St. Mary's Wesleyan chapel and schools, and finally the works of the cathedral, where Mr. Price, the clerk of works, kindly acted as guide. Several of the party ventured to the top of the central tower, which has reached a height of about 150 feet. The walls have nearly reached the stage at which the spire will begin, but there is yet another 100 feet of work to be done before the highest point is attained. From the topmost scaffolding a very fine view of the city is to be obtained. Chancellor Worledge acted as guide within the sacred building, where the beautiful plate, the reredos, baptistery and other parts, together with the fine stained glass, were observed with close interest. The municipal, bank and other buildings were glanced at on the way to Mr. Trevail's house in Lemon Street, where luncheon was provided by the generosity of the host. Later the company embarked on the steamboat, the *Queen of the Fal*, for a trip to Falmouth, where, despite the rain, several places of interest were visited, returning later to their host's house at Truro for a parting cup of tea before leaving the city, after a memorable day's outing and a Cornish welcome.

### THE CHISLEHURST TUNNELS.

ON Tuesday Sir Benjamin Baker made a thorough inspection of the Chislehurst tunnels and has reported to the directors of the South-Eastern and Chatham Railway. In the case of the old tunnel, for a comparatively short length there was, he found, some flaking off of the brickwork at the side of the wall nearest the new tunnel and at the crown of the arch. The new tunnel at the same spot also showed some slight signs of abnormal pressure, as there were a few vertical cracks in the side wall nearest the old tunnel, and the drainage culvert was somewhat distorted. The cause of the damage in both cases was the compressible nature of the soil intervening between the two tunnels at this particular spot; the old tunnel had stood nearly forty years without any signs of failure. The remedy in both cases was, he thought, the same, namely, to invert certain lengths of both tunnels, so as to distribute the weight over the foundations and prevent side walls from moving forward. This was a simple and comparatively inexpensive work, and had often been done before in the case of many other railway tunnels under similar circumstances. It could be executed far more expeditiously and economically if the tunnels were handed over to the contractors free from traffic, and at the same time all risk of accident to trains from portions of brickwork flaking off and falling on the rails would be avoided. Sir Benjamin Baker strongly advised, therefore, that the traffic should be diverted, not merely until the damaged brickwork of the side walls and arch was restored, but until the new inverts were completed. This course would not only be safer, but involve, in his opinion, less public inconvenience in the long run. The directors will act upon the advice of Sir Benjamin Baker, and regret that some inconvenience will be caused to passengers on the main line portion of the South-Eastern section below Grove Park, but every effort will be made to minimise it as far as possible.

### OUNDLÉ, NORTHAMPTONSHIRE.

THIS picturesque Northamptonshire town, as yet unspoilt by the busy commercialism which defaces so many of its neighbours higher up the Nene Valley, forms a most convenient centre for an architectural holiday in the fertile district by which it is surrounded. Its own attractions to the student are neither few nor small, the quiet stone-built streets abounding in quaint and interesting "bits." One of the most striking features in the market square is the very pleasing Renaissance building (an ironmonger's shop), which appears in two of the sketches on centre plate. This telling design is produced by very simple means, and entirely with local material. The columns of the open loggia and other stone dressings are of Ketton stone, the mass of the walling being of Welldon stone

in very thin courses, and the roof covered with Collyweston stone slates. Wood bressummers support the upper storey, and the simple modillion cornice is also of wood. Several other buildings of similar style and almost equal interest may be seen in other parts of the town.

The church of St. Peter contains many interesting features, and work of all periods from Early Pointed to Perpendicular, presenting in particular excellent facilities for the study of the evolution of window tracery, of the growth of which almost the complete sequence may be traced. The plan is very complex, in effect, the transepts being very fully developed. An ancient wooden pulpit, bearing abundant traces of colour and gilding, and a brass eagle lectern rescued from the bed of the river deserve careful scrutiny.

Externally the whole effect is dominated by the immense tower and spire soaring into the air upwards of 300 feet. The tower, considerably later in date than the rest of the church fabric, was apparently built as an independent structure—detached by some few feet from the west end of the nave—a wise precaution in view of the considerable settlement likely to occur at first, owing to its concentrated and heavy loading of the foundations. At some subsequent date (though probably carrying out the original intention) a lofty arch was formed in its eastern face and the nave walls extended against its



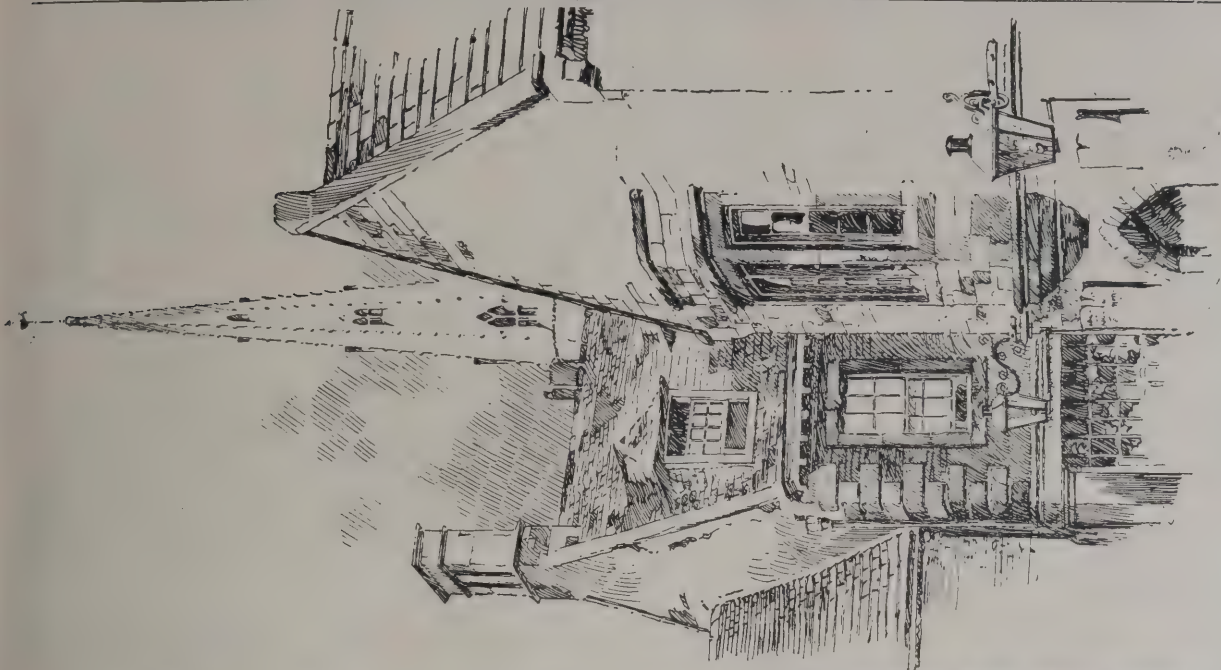
OUNDLÉ CHURCH  
WEST DOOR.

S. NORTH.

buttresses, thus throwing its lower storey open to the church. The spire bears the date 1634 inscribed on a stone at its base—probably that of its rebuilding or reparation after one of those mishaps from lightning or tempest so frequently recorded in the history of these lofty landmarks. The form of the open crockets is peculiar, resembling somewhat the handle of an earthenware jug. A characteristic local treatment, of which this is perhaps the earliest and most successfully managed example, is the cluster of castellated turrets taking the place of the more ordinary pinnacles masking the transition from square to octagon plan at the junction of tower and spire. Kettering and All Saints, Stamford, show a similar motive.

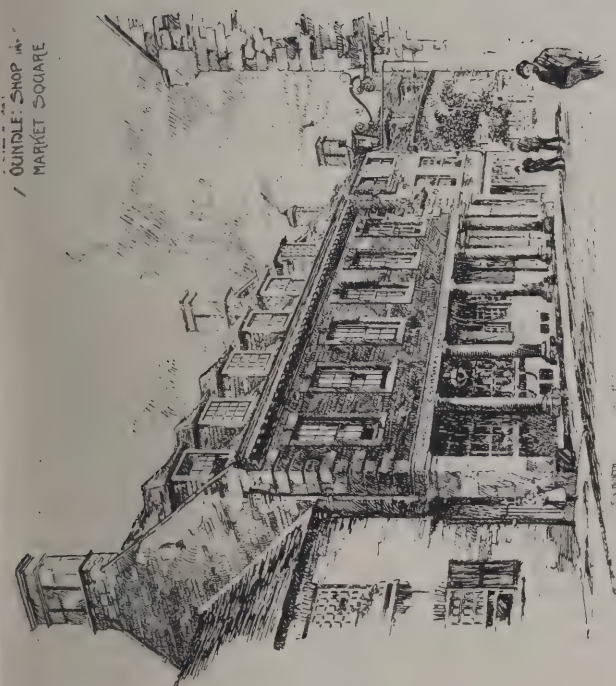
Of the old inns of Oundle much might be written—their number is prodigious. The Talbot has been frequently illustrated, but for picturesque effect must yield the palm to the White Lion, opposite the east end of the church. The fine trees of the graveyard lend much of the effect to this charming group.



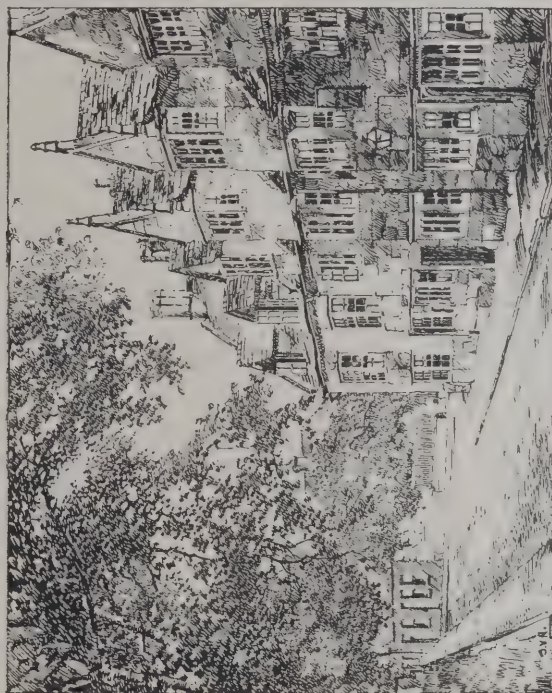


SW NORTH.

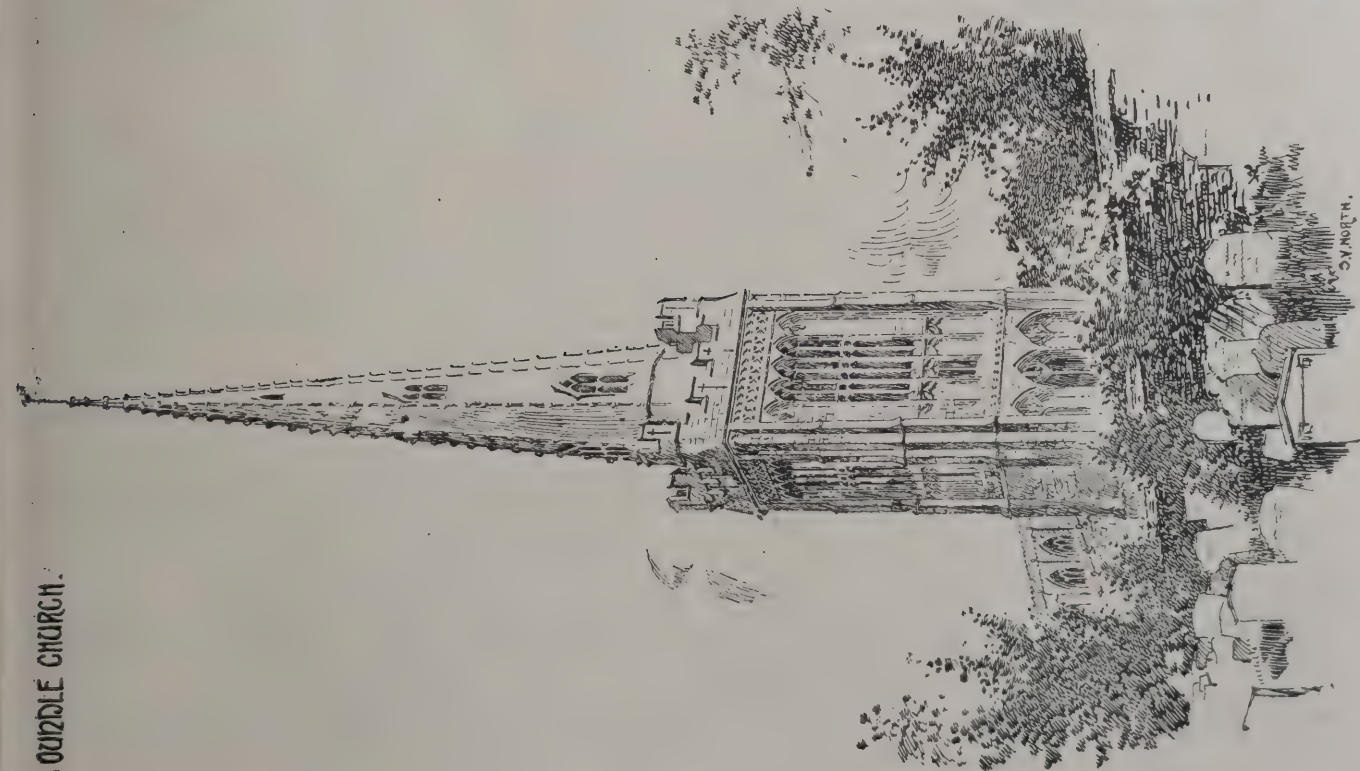
COUNCIL SPIRE FROM  
THE MARKET SQUARE.



COUNCIL SHOP  
MARKET SQUARE



WHITE LION INN, COUNCIL.



COUNCIL CHURCH.

SW NORTH.



## NOTES AND COMMENTS.

THE difference between the principles adopted in valuing buildings is never more markedly displayed than in cases relating to assessment for rates, for on those occasions more liberty is allowed to witnesses. This week an appeal was heard at the Portsmouth Quarter Sessions which at first sight might appear to be simple, and not to allow of much controversy. It related to a building in Southsea which is used as a branch by the National Provincial Bank, Ltd. The site cost 2,550*l.*, and the expenditure on the building was 10,556*l.*, or, in all, 13,100*l.* Recently the premises were assessed at 500*l.* gross and 425*l.* rateable value. An objection was raised by the banking company, and notice was given of appeal, whereupon the gross value was reduced to 400*l.*, and the rateable to 340*l.* One witness estimated the value of site and building at 11,500*l.*, and assuming 4½ per cent. to be a fair return, the gross value would therefore be 517*l.* 10*s.* and the rateable 471*l.* 10*s.* Another witness put down the gross value at 612*l.* A third witness said if the bank were to be let he would regard 360*l.* as a fair rent; the gross value he estimated at 345*l.*, and the net rateable value at 293*l.* 5*s.* The last witness put down the values at 350*l.* gross and 297*l.* 10*s.* net. It is not surprising that with amounts which were so much at variance, Mr. WARRY, K.C., the Recorder, who heard the appeal, should decline to give a decision until the next sessions.

THE "building of a railway" is supposed to be an Americanism. In England it was usually understood to be more correct to say the construction of a railway, the verb to construct being applied to works on an extensive scale, while to build was restricted to houses and other structures having a roof. The American invasion has broken through the boundaries of language. Last week the Master of the Rolls declared that the word build was not confined to bricks and mortar, but was certainly applicable to a railway embankment. When we recollect how vast is the difference between shaping and laying stones or bricks, preparing woodwork and the numerous skilful operations which are required in a house, and, on the other hand, the simple operation of forming an embankment by the tilting of numerous truckloads of earth, we must say language has lost its precision when we find work so unlike designated by one term. Certainly it was to be expected that the Court of Appeal would refrain from sanctioning so much laxity in the use of words. The case under consideration was novel and interesting. The Long Eaton Recreation Grounds Company, Ltd., purchased an estate which they wished to utilise partly for sports and partly for building purposes. All the plots were sold under certain conditions. One was that no fence wall more than 2 feet high, with suitable iron palisades, was to be set up, and that only private dwelling-houses were to be erected. Some of the plots were resold to the Midland Railway Company, who therefore adopted the restrictive covenants. But instead of houses an embankment was raised, and instead of a 2-foot fence wall they formed a post and rail fence. The plaintiffs claimed compensation and were awarded 650*l.*, which was confirmed by Mr. Justice LAWRENCE. The railway company appealed, and contended that the covenant against the raising of any buildings but dwelling-houses did not apply, as there was a distinction between a building and an erection. The word "erection" was much more comprehensive than "building," and included such a thing as an embankment, whereas an embankment was not a building. The Court of Appeal, as we have said, adopted another interpretation of the word "build," and the appeal of the railway company was accordingly dismissed.

A LIGHT has been thrown upon the economical or rather commissariat arrangements adopted in ancient Greece whenever public buildings had to be constructed on an exceptional scale. In the town of Kyzikos, on one of the islands in the Sea of Marmora, there lived in the time of the Emperor CALIGULA an influential princess who was the mother of three kings. ANTONIA TRYPHAINA resolved to restore some of the chief structures in Kyzikos and to make improvements in the harbour. Whenever there is a

demand for labour it is always forthcoming, and workmen came from all quarters attracted by the possibility of receiving high wages. But as happens at the present moment in South Africa, where the wages seem to be unusually liberal because nothing is mentioned about the enormous increase in the price of food and shelter, so in Kyzikos there seemed to be a likelihood that the workmen on learning the true state of affairs would depart and leave the unfinished works as a warning to those who came after them. An inscription has been found which reveals the measures which were adopted for the regulation of the difficulty. It was ordered that the authorities of the town should fix the prices for goods in the market, and that no dealer was to vary them on any account. A rise of prices was to be dealt with as an offence against the common weal. Every citizen who disobeyed was to lose all rights, and strangers who changed their prices were to be cast out of the city. The stalls of offenders were to be closed until the building operations were completed, and on each of them a proclamation was to be affixed announcing the cause of their suspension. Theoretical economists who know little of the suffering which is produced by unexpected rises in the cost of food, may condemn the arrangements as barbarous, but a great many building workmen and navvies engaged on English contracts will testify that it would often be an advantage if a similar protection was afforded them in our times.

No more than five gold medals, or about one-half the usual number, have been awarded this year in the National Competition of Schools of Art. There are, it must be understood, no competitors from the Royal College of Art, and other prominent schools are unrepresented. But there is no doubt the judges have become more rigorous. The medallists belong to the Battersea, Birmingham, Liverpool, New Cross and Sheffield schools. Consolation may be derived in the 85 silver medals, 297 bronze medals and 739 book prizes. The "art nouveau" does not find favour with the examiners, and its influence on some of the students is regretted. The style, or rather fashion, is admired by many, and it ought to be considered whether students should not show themselves competent to meet the needs of the time. If a manufacturer thinks there is a demand, although only a temporary one, for the latest mode, it can hardly be expected that any of his designers would resist his directions, and in that way rise in revolt against their employer. A question of artistic ethics is connected with the subject, and it ought to be conceded that students in the schools should be able to deal with the requirements of the day. The authorities have, however, always a tendency to neglect the present for the sake of the past, and, owing to the manner in which prizes are bestowed on the decision of judges who are not infallible or indifferent in their own lives to what fashion exacts, a character of obsolescence is imparted to the schools, which no energy on the part of the masters can remove.

It is believed that the Louvre contains about 42,000 original drawings; they are not all, of course, by great masters. Several among them are not of higher quality than those which may be met with in dealers' portfolios. The collection is not sufficiently known to the public, and it has therefore been proposed to compile a catalogue of the most remarkable drawings of each school. But to bring out a work in a style suitable to the drawings would be very costly, and would not serve the purpose of the authorities, being restricted in its sale on account of the costliness. Meanwhile, it has been resolved to attach notices corresponding with those usually found in a catalogue to the drawings which are exhibited, and which will be changed from time to time. Every amateur is not able to realise the subjects of many drawings, nor to understand what relation they may hold to famous pictures. The information given will, therefore, be acceptable to many.

## ILLUSTRATIONS.

GENERAL EXTERIOR: LLOYD'S BUILDING, FENCHURCH ST., E.C.

HARROGATE TOWN HALL.

CATHEDRAL SERIES—HEREFORD: NAVE ARCHES, NORTH SIDE.





#### HEREFORD CATHEDRAL IN 1786.

ONE of the early water-colour artists in this country was Thomas Hearne. He with Cozens, Paul and Thomas Sandby, and Taverner should be looked upon as the pioneers of the art. Hearne was born at Brinkworth, near Malmesbury, in 1744. He went to London early in life, where he was granted a premium at the Society of Arts in 1763, was apprenticed to William Woollett, the engraver, in 1765, and continued with him some six years. At the end of that time he accompanied Lord Lavington, who had been appointed Governor of the Leeward Islands, and for three years and a half was employed in making drawings of the landscapes, forts and harbours of the islands. He abandoned engraving, and devoted himself to drawings of topography, for which he was well adapted. In 1777 he began an extensive tour in England and Scotland, in preparation for a large work he afterwards brought out, in conjunction with William Byrne, called "The Antiquities of Great Britain." The drawings for the work, fifty-two in number, were exhibited at the Spring Gardens Rooms. They were the product of nearly four years' work. He contributed between 1780 and 1802 twenty-four drawings of landscape and old buildings to the Royal Academy exhibitions.

Hearne's works, though restricted in colour, are harmonious and sunny; his drawing is true and elegant, showing direct

observation of nature, and by these qualities, combined with a fine sense of composition, he greatly advanced the art of landscape-painting in water-colour, and had a strong influence upon Girtin and Turner, who copied his drawings at Dr. Monro's and Mr. Henderson's. He used the pen in order to define outlines, but less obtrusively than other artists of the time, and his architectural representations become more effective in consequence.

In 1786 Hearne visited Hereford. The fall of the western tower and a part of the nave occurred on Easter Monday of that year. He was therefore able to give a representation of the ruined building before the whole of the old masonry had been removed. From Hearne's general accuracy it may be taken for granted that he gives an exact view of the appearance of the nave, and by contrasting the above reproduction of the engraving made from the drawing for John Britton with the larger view we publish this week, one of James Wyatt's innovations will be manifest. All the parts above the lower Norman arches must be debited to Wyatt, and, moreover, in his restoration he destroyed the interior effect of the building by shortening the nave to the extent of one bay. If it were not for Hearne's drawing there might be doubts about the extent of Wyatt's tampering, which falsified the architectural history of the cathedral.

#### WHY THE CAMPANILE COLLAPSED.

A CORRESPONDENT of the *Scotsman*, Mr. A. Robertson, writing from Venice on July 15, the day after the collapse, says:—

This morning, in the company of the engineers who have charge of Venice monuments, I have been all over the sad pyramid of ruins that marks the spot where but twenty-four hours ago the noble Campanile of St. Mark's raised its proud head high into the air, over which, as it were, hung the great gold angel glittering in dazzling brightness in the rays of the early sun. A landmark, a seamark, to which thousands and tens of thousands turned their eyes as they threw open their shutters to the light and the breeze of the morning. I say "where it stood." For it did not fall. It shrank into itself. It collapsed like a pack of cards. The Campanile is not. It has gone, disappeared for ever. A Campanile will rise again, but not the Campanile we knew. That has gone for ever. And what is there? One of the saddest ruin heaps I have ever

seen. It is a pyramid 50 or 60 feet high, and over a thousand feet in circumference. They have covered the sculptured base of one of the three great standard poles of the Republic. They have surrounded the first open porch of St. Mark's Church that rests on slender marble shafts, but they have not touched it. In front of that porch stood a short thick column of red porphyry, the column of "il bando," as it is called, of banishment, of exile. A huge piece of marble adhering to a mass of brickwork, with an iron bar run through it, was hurled, as if shot from a cannon, against that column. The shock made it leap clean out of the ground, but it saved the church. The huge block of marble and brick and iron was stopped 10 inches from the marble shaft. Other pieces, meeting no resistance, were hurled against the basement wall of the baptistery, doing but little harm. Inside the porch the angle of the main body of the church is buried in debris, but probably little harm is done. All about lie broken columns, bits of carving, pieces of hewn stone, huge twisted sheets of copper roofing (for the green sloping roof of the loggia



on the top of the Campanile was copper); iron bars bent and broken, and shattered, splintered marbles everywhere—gleaming, too, here and there, all over the heap were pieces of the broken bronze bells that, hung high up in the loggia, had called the senators to the council hall, the workmen to the arsenal and the people to prayer, down the centuries, from generation to generation. Their tongues now for ever silent. One of the five bells, a small one, seemed unbroken. It lay buried in the debris near the top of the heap, with the entire rim of its mouth exposed. I think it is the one that was named "Preghiera," that called morning and evening the Venetians to their prayers.

And now about the why of the collapse of this colossal Campanile.

1. Though the walls were thick, for they were only a few inches under 6 feet, they were really not solid. They consisted of two parallel walls of brick, the space (3 feet wide) between them being filled up with broken bricks, rubble, cement, stones, &c. Therefore the walls were not so strong as they looked.

2. The cement used was Istrian lime mixed with sea sand. This lime does not become hard, nor does it adhere well to the bricks. Indeed, in the course of the past centuries it became dry powder. It is all over Venice to-day. It formed the cloud that hid the falling Campanile.

3. It had been damaged by lightning, by fire and earthquake several times. On June 7, 1398, it was struck by lightning. In 1401, on the occasion of festivities for the Doge Michael Steno, fires were lighted on the platform, and the top was burned. On October 24, 1403, the same thing happened. In 1405 the same thing happened. In 1417 it was struck by lightning, and the new top of wood again burned. On June 21, 1436, all the shops round the Campanile built against it were burned. On March 26, 1511, an earthquake split its four corners. In June 1548 it was struck by lightning. In 1565 it was struck by lightning. On July 10, 1591, an earthquake caused it to shake from top to bottom. In 1653 again struck by lightning. On August 23, 1657, again struck by lightning. On April 23, 1745, again struck by lightning, which damaged its east side severely, killing many people in the Campanile and near it. This was its last and most serious damage, although it was not till June 18, 1776, that the Republic employed the scientist Guiseppe Toaldo to put up a lightning conductor.

4. The Republic, seeing its east side to be severely damaged, consulted two engineers of fame and ability, Signor Zandrini, of Venice, and Signor Polene, of Padua, to examine and repair it. These engineers said the whole wall wanted support, and they proposed building a new wall against the old one. This was done. But the new wall was never properly tied to the old one. The two were practically separate, and so the weight of the Campanile was borne unequally and its equilibrium disturbed?

5. The ringing of the bells, the firing of artillery, and only three weeks ago the simultaneous firing in the Piazza of hundreds of muskets had a tendency to disturb it. Also the more or less frequent earthquakes that visit Venice.

6. Twenty years ago one of the corner pilasters of the inner wall, and precisely that at the north-east corner, was seen to be cracked in many places. The authorities of St. Mark's Church, who have charge of the Campanile, as it is the bell-tower, had this plaster tied up. No more cracks appearing anywhere, the Campanile was thought perfectly safe and was let alone.

7. And now comes the critical point. The Loggia, little marble hall built by Sansovino, rests against the eastern wall of the Campanile. It had almost a flat roof. To prevent the rain beating against the Campanile and running down its side from entering this marble hall, a row of slabs of stone sloping downwards was inserted in the Campanile where the roof met it.

8. Only last week, that is, but ten days ago, these stones were begun to be removed, as the rain was somehow getting into the Loggia, and a lead sheeting was to have been substituted. Instead of carefully removing one stone at a time, they removed half of them, that is, 25 feet of them. Not only so, but they dug through the new wall of the Campanile, that of 1745, and struck the old original wall, which they found separate from the new, and full of holes and cracks. Whilst working, the old wall slipped down an inch or two. Instantly the cut made was built up, but it was too late. On Wednesday it was observed that the new wall was cracked at the north-east corner, above the Loggia, where the work was begun. On Thursday it enlarged. On Friday it struck across the north side of the Campanile, sloping upward to the second window from the ground, then up to the third. On Saturday it passed behind the fourth and through the fifth. On Sunday the situation was, to use the word of an engineer, "desperate," and the Campanile was doomed. On Monday the crack visibly opened whilst we watched it, and the end came in a moment, when the whole structure sank into itself.

Now for the responsibility. Who was responsible?

First, the engineer of the Campanile is Signor Saccardo,

who is the engineer of St. Mark's Church. But Signor Saccardo is not the engineer in charge of the "marble hall," the Loggia of Sansovino. That is under the charge of the authorities who take care of other national monuments in Venice. Secondly, these authorities in repairing the Loggia roof, for which they were responsible, cut into the Campanile, as we have seen, as one might cut into a tree they intended to fell, and this they did without consulting Signor Saccardo, who bears the care of the Campanile.

The cutting, had the Campanile been in good condition, would have had no effect upon it, but as things were it was the last straw that broke the camel's back.

To-day the Minister of Public Works, Signor Nasi, accompanied by Signor Calderini and Signor Boito, have arrived from Rome, and an inquest will be held.

Meantime I have but two observations to make. First, knowing the perilous condition of the Campanile, was it right to allow travellers to ascend it as recently as Saturday night? Many, many, climbed its gradient steep on Saturday, the last ever to do it. Was it right to allow thousands of Venetians and strangers to promenade under its shadow on Sunday? It was only on Sunday night the band was ordered to stop playing. On Monday morning, ten minutes before its fall, we ourselves were round and round examining and touching it. Secondly, there are too many masters in Italy. The idea of two monuments, built against each other, like the Campanile and the Loggia, being under different authorities, who work independently of each other. In Venice, indeed, there are five different sources of authority in regard to such monuments, namely, the authorities of St. Mark's, the authorities for the care of monuments, the Belle Arti authorities, those who have charge of public works and the Committee of Vigilance. Then there is a seventh, the artists, who often make their voices heard in favour of not disturbing the old worn time-eaten face of things, and who sometimes hinder external renovation.

The Campanile weighed, it is calculated, 22,000 tons. That is the mass of debris, the pyramid of material, to be sorted and cleared before rebuilding can be begun. Subscriptions are being taken up for that purpose, and 500,000 francs has been already received or promised (20,000*l.*); but of this another time.

A correspondent of the *New York Herald* in Venice telegraphs:—The immediate causes of the tower's fall were the cutting of a fireplace and chimney inside, to enable the custodian to have a fire, and the cutting of a trench along the east wall, above the roof of the Loggia Sansovino to remove the rain-beaten stones and put in zinc. Signor Rupolo, the official engineer in charge of the work, cut the trench on Monday, July 7. He perceived the danger and gave the alarm; but nothing was done until Thursday, and the public was assured there was no cause for alarm.

Signor Luigi Vendrasco, the architect, was the only man who realised that the Campanile was in danger twelve years ago, when he wired to the Government expressing his fears. A special commission then appointed reported that there was no danger and Signor Vendrasco was officially reproved. In 1892 Signor Vendrasco again wired to the Government that the Campanile was in danger. Again the commission reported that it was not in danger. Signor Vendrasco was cashiered four weeks ago, when he once more reported that the tower was falling. On Monday Signor Vendrasco examined the tower at five o'clock in the morning. He then said, "It will fall in a few hours." Nobody believed him, and the broken-hearted old man left Venice the same morning.

I have had an interview with Signor Antonio Vendrasco, the son of the famous architect, Signor Luigi Vendrasco. Signor Nasi, the Minister of Public Works, telegraphed to the latter, summoning him to Venice, but he refused, replying:—"The Campanile is destroyed. I cannot save it now. You want me to bear witness so as to fix the responsibility on this person or that. I will not do so." Signor Antonio Vendrasco said to me:—"The Campanile, like an old man, needed tender handling. My father knew its condition and protested in 1892—and often since, up to Monday, July 7—that it could be saved by rebuilding the four angles in rotation, a small piece of each at a time. My father took me to the tower last Sunday and showed me the crack. I remarked, 'The walls are 5 feet thick and that crack is not dangerous.' My father replied, 'But see the cause. A cut 35 centimetres deep has been made right across the east side. The Campanile has listed eastward. It is doomed. It is like an old oak tree—felled.'"

Signor Rupolo, the young architect of public monuments, confesses that when he had finished the cut the Campanile listed and cracked. He inserted staves and wooden wedges but without avail. Signor Vendrasco would have put in copper wedges, but probably nothing would have saved the Campanile after the fatal cut was made, which was the immediate cause of its fall. The estimated cost of rebuilding the tower without renewing the foundations will be three million lire. If the



foundations are renewed an additional million will be required. One million lire has already been subscribed.

A *Herald* correspondent has asked the opinions of some of the most famous Paris architects respecting the collapse. The opinion, almost unanimous, of these gentlemen was that the disaster was inevitable, and that it would cost too much to reconstruct the edifice; at any rate, the reconstruction would be much more costly than their American colleagues seem to suppose. With one exception none of them ventured to form an estimate, even approximate, of the cost, and the exception mentioned a figure far higher than the estimates formed in New York.

M. Corroyer said:—"The question you put to me is almost impossible to discuss. Those who talk of 6,000,000 francs for such an enterprise form an absolutely fanciful estimate. It would be impossible to form an estimate at all without a previous study. In any case, the figure appears to me altogether inadequate. What I must say in the most positive terms is that I fail to understand how it is that the misfortune was not averted. That measures of preservation were not taken in time is to me wholly inexplicable. But since the catastrophe has happened, I consider it would be best to give up such a risky enterprise as to reconstruct the tower."

M. Jourdain said:—"It is materially impossible to attempt to make even an approximate valuation of the cost of reconstructing the Campanile. In spite of the ten centuries which have passed over its head, it is impossible to understand the collapse, or at any rate the neglect which must have been its cause. Such an event could not have occurred without previous warnings. There must, therefore, have been most deplorable indifference. But, in spite of my desire to satisfy the *Herald* by giving my opinion on the probable cost of the new Campanile, it is absolutely impossible for me to do so. Nothing is simpler for a writer to name, offhand, a sum which commits him to nothing, but an architect cannot do such a thing. I expect that all my colleagues will tell you the same thing, and I agree with those who hold that it is better now that the tower is destroyed not to reconstruct it."

M. Sanson said:—"It is extremely difficult to appreciate such subjects from a distance. In any case a previous study would be necessary. With the aid of good contractors the thing might be done in a few years, but one must be well backed up, especially in such an enterprise, where nothing must be left to chance. I think the thing would be risky, and though I have succeeded hitherto in keeping within the limits of my estimates, it has been due to the aid given me by my collaborators. Personally, while I deplore the destruction of the tower, without being able to understand how it could have been allowed to happen—for such an edifice does not tumble down like a house built with cards, and these accidents always occur after long warning—I consider that since it has disappeared it would be best not to rebuild it. I am very doubtful in regard to reconstruction. Viollet-le-Duc, who was no novice, seems to me to have failed in all his reconstructions, well treated though they may have been. Mind, I do not criticise his manner of treatment; no one could have succeeded better than he did. But, generally speaking, such reconstructions convey a false impression. Such an impression I have always felt at the Château de Pierrefonds, and before the mantelpiece in the Salle des Princes. It does not produce the effect of the mantelpiece of a feudal castle to my mind."

Mr. Stanford White, of the firm of Messrs. McKim, Mead & White, New York, said:—

"From all I can gather from the printed despatches the fall was due to the weakening of the foundations of the structure. The tower itself was in perfect condition. I know it well, and am certain there was no structural weakness. It was built of good materials, covered inside, and the base was considerably larger than the top. That its fall was due to the weakening of the foundations is shown by the fact that the structure tilted over from the base, and that a crack appeared before the fall, showing that there was an unequal distribution of the weight of the Campanile. The brickwork held together till the tower actually began to fall. I think there must have been a giving way of the piles on which the tower was built. Once the foundation, which consisted of piles, began to give way there was little chance of the building standing. Had the foundations been of solid masonry they might have settled to some extent and thrown the building out of the perpendicular, as is the case with the leaning tower of Pisa. Yet the structure would have stood until the top got beyond the line of the centre of gravity. Stone foundations would have been strong enough to resist this leaning tendency. In the case of piles driven into the mud, however, the conditions are entirely different. The weight of the building, once the piles begin giving way at one corner, tends to make the timbers slant outwards. The building leans in the opposite direction and the result is the fall of the structure. The cost of building a good foundation for a new structure would be great. Labour in Italy is considerably cheaper than here. Materials also cost less. I should think the rebuilding of the Campanile would cost at least 500,000 dols."

## WAREHOUSE BUILDINGS.

THE fire brigade committee of the London County Council have presented a report in which approval is given to the opinions of the chief officer which were expressed at the inquiry into the causes of the Barbican fire. Captain Wells said that the state of affairs in many parts of the City to-day as regards the conditions under which stock was kept and dealt with was considerably different from what it was a few years ago. Owing to the narrowness of many of the thoroughfares buildings were arranged in very large floor spaces so as to insure the greatest amount of light being obtained. Doorways were constructed in party walls, and lifts were now more generally provided, but cross walls and protective facial work, the factors in construction which mainly operated in delaying the spread of fire, were practically non-existent. Without advocating shutter appliances, which experience led him to regard somewhat in a questionable light, he suggested that improvements could be made at a comparatively small cost by the use of protected glass, by dispensing with wood on the exposed sides of buildings, and by more attention being paid to the construction of roofs, and, in connection with the risk to life, to the provision of alternative means of escape from buildings. The jury deprecated the use of match-boarding for walls and ceilings. That view was, the committee said, shared by all who had had experience in connection with fires in buildings in which the material was used. The law, however, would have to be altered before the suggested prohibition could be enforced. They understood that the Building Act committee would in due course report to the Council on that point and many others in connection with the proposed further amendment of the London Building Act. At the meeting of the Council on Tuesday the Building Act committee submitted a report containing revised regulations as to the provision of means of escape from fire at factories and workshops. The most important alteration in the requirements was that means of escape should be provided on the ground as well as the upper floors.

## ARCHÆOLOGY IN WILTSHIRE.

THE annual report of the Wiltshire Archæological Society refers to the value and use and good work of the Society, which were being year by year more generally recognised, not only in the county but by important authorities outside of it. Numbers XCVI. and XCVII. of the magazine had been issued. The former was a remarkable contribution to bibliographical work, for which they were greatly indebted to Mr. W. Jerome Harrison, F.G.S. It was the result of many years' study and labour, and recorded all books relating to Stonehenge and Avebury, the two great rude monuments which make Wiltshire famous. The editor of the magazine had, as in former years, received important help from Mr. G. E. Dartnell, in the shape of notes or articles, illustrations, &c., in papers and magazines dealing on Wiltshire matters, and for the lists of Wiltshire books, articles, &c. It would be a great assistance if members in other parts of the county would call his attention to any locally published pamphlets, illustrations or books, many of which without such help must necessarily escape notice. The collections which the Society was gradually acquiring had been visited and revisited more than once by gentlemen whose opinions freely expressed were of recognised value. The most notable gift to the museum during the year had been a considerable collection of flint implements from Knowle Farm, Savernake Forest, presented by Mr. S. B. Dixon, of Pewsey. This had been the most remarkable archæological discovery made in the county for many years. Great interest had been aroused by the peculiar condition of the flints, which in some respects, such as the polish seen on some of them, was most remarkable, and had not yet been satisfactorily accounted for. To the library had been added a large new scrap-book filled with prints and drawings which had recently accumulated. The Society's set of "Archæologia" had been completed nearly up to date by the kind gift of seven parts by Mr. Howard Bell, and the Rev. W. Butt gave a book of MS. notes on Stonehenge, in addition to many other books given by the Rev. Canon Wordsworth and others. The past year had been a notable one in the county from an archæological point of view. Prominent, of course, amongst other work had been the excavation around the leaning stone at Stonehenge, and in the re-erection of it in its original upright position. There could be no doubt but that that would go far to save it from rapid decay and destruction in the position it previously held. The result of the excavations so skilfully made by Mr. Gowland (a vice-president of the Society of Antiquaries), and of the very important astronomical observations made by Sir Norman Lockyer and Mr. Penrose, have gone a long way towards setting at rest the speculations of earlier days as to the date of the great stone monument. The Society has every reason to congratulate Sir Edmund Antrobus on the success of



his efforts to preserve the stones on the lines of the recommendations of the joint advisory committee. Without effective enclosure it would have been quite impossible for the investigations referred to to have been carried out. The great stones at Avebury require careful watching, warnings having been received from time to time that they were not free from risks of injury. The recommendations made by the Society last year as to the Reeves Tomb at Edington, and the remains of the carved reredos, had been attended to. The Rev. J. Sylvester Davies had been steadily working at the transcription of the Tropenell Cartulary placed at the disposal of the Society by the present owner, Mr. H. Bell, and he now reported that more than one-third of the laborious work was done. In the even more laborious work of the copy of churchyard inscriptions, Mr. T. H. Baker continued unwearily in South Wilts, and the Rev. E. Dorling had promised to do the heraldry of at least a portion of the churches in that part of the county. The Rev. G. B. Toppin continued his aid in transcribing Mr. Baker's manuscript. A barrow at Erlestoke, on which a note appeared in the magazine, was opened under Mr. B. H. Cunningham's superintendence. During the restoration of Lydiard Tregoze Church by Mr. Ponting a series of interesting frescoes was discovered, of which it was hoped an account might appear in a future magazine. The most important step taken by the Society during the past year had been the purchase of the house and garden adjoining the county museum at Devizes. This will enable the Society to extend the buildings and to obtain space for exhibiting much that was now difficult to display. It was not proposed to incur any further cost this year, but it was to be hoped that the result of a special appeal to the county next year on the occasion of the jubilee meeting will be a building fund sufficient in amount to warrant a commencement of the contemplated alterations and additions. Thanks were due to the vendors for granting a conveyance of the property free of cost.

#### THE SULTAN OF MOROCCO'S PALACE.

THE Sultan, says a correspondent of the *Times* at Fez, on account of the draining of some marshes near his palace, has decided to move into another palace in a more healthy situation. This latter building was in course of erection at the time of the death of the late Sultan Mulai el Hassan, and was never completed; but His Majesty has given orders that it is to be ready for his reception in three days' time. Every available workman in Fez has been commandeered for the completion of the building, and the arsenal is working day and night. A short time ago I accompanied His Majesty on a visit to the new palace. It consists of a courtyard some 200 yards long and 100 yards wide, paved with marble and mosaic tiles, with a sunk garden in the centre. At either end of the courtyard are arcades, on to which open the usual large high rooms of Moorish palaces, gaily decorated with painted ceilings and tile dados and floors. A number of fountains of marble add a pleasing effect to the gardens and arcades. There is no doubt that the situation is more healthy than that of the much larger palace in which His Majesty has been residing.

#### THE SIZE OF BOARD SCHOOLS.

THE school accommodation committee of the London School Board have presented a report upon the subject of the proposed limitation of the size of schools. The Board of Education wrote in March last informing the School Board that they had been giving careful attention to the general principles which should regulate the size of schools and the size and number of departments which they should contain both in London and in the country; and that they were of opinion that a school should not, as a rule, contain more than 1,000, arranged in three departments of 300 boys, 300 girls and 400 infants, or 300 senior mixed, 300 junior mixed and 400 infants; and that only under exceptional circumstances could a school with three departments and a total of 1,200 be sanctioned, though, with an additional junior mixed department, a larger total might sometimes be accepted. They added that as the Board of Education would bear these principles in mind when considering all plans for new schools and enlargements of existing schools, the retention of sites in the schedule would not necessarily commit the Board of Education to the approval of any proposals which the School Board might submit hereafter with regard to them. Some correspondence with the Department had taken place, and the committee now proposed that the Board should send a memorial to the President of the Board of Education upon the subject. In the course of the memorial it was stated:—"The London School Board fully recognise the advantages of smaller schools, especially where the circumstances of the children make the moral influence of the teacher even more important than his intel-

lectual influence. On the other hand, several of the largest of their schools are also among the most successful, as is attested by the Board of Education, and so far as they are aware, a majority of those interested in education are in favour of large schools. In Scotland and America, to take two instances, one of them under the control of the President of the Board of Education, the tendency is apparently to increase the size of the school under the one head, and to accentuate the importance of skill in organisation rather than the personal influence of the headmaster. The London School Board therefore urge that no hard and fast rule should be set up, but that different managers should be left free, as at present, to try different schemes in different circumstances. In most of the schools which the London School Board are now building it is impossible to vary the proposed size without ruining the plan or very gravely increasing the cost; and even in the case of future schools the cost of small schools will be considerably greater. But in making proposals for future accommodation the London School Board, while hoping to modify the views now laid down on behalf of the Board of Education, will of course conform to their final instructions."

#### THE PROGRESS OF BRISTOL.\*

IT may be interesting to note the changes that have taken place in this ancient city since the last visit of the Association at an annual meeting in 1877. Twenty years after that date, an important extension of the city boundaries was sanctioned by Parliament other smaller extensions having been granted in 1895 and 1901, so that the area of the city has increased from 4,687 acres in 1877, to 11,607 acres at the present time. At your last meeting the population was estimated at about 203,000; it is now estimated at 334,632. The rateable value was then 772,623*l.*; it is now 1,596,213*l.*

The success of the city is largely bound up with the docks. Mr. Ashmead's paper, read in 1877, described the works executed in the early part of the nineteenth century by a private company, but subsequently acquired by the Corporation, the policy of this action being shown by the fact that the tonnage of foreign imports increased at once nearly fourfold under the civic management. The increased size of vessels after the introduction of steam as a propelling power intensified the dangers of the navigation of the narrow and tortuous river Avon, and docks were constructed by private enterprise on both sides of the mouth of the river where it joins the estuary of the Severn. These docks were also acquired by the city. For a number of years a series of fierce battles was fought over rival schemes for dock extension or for converting the river Avon into an elongated floating dock by placing a dam across its mouth; but last year a Bill was obtained which sanctioned an expenditure of something like two millions sterling on dock extension at Avonmouth. The work has been auspiciously commenced this year by the visit of the Prince and Princess of Wales to cut the first sod. The intended works will be described by the docks engineer, Mr. W. W. Squire, M.Inst.C.E., when the members of the Association inspect the docks at Avonmouth on the 12th inst., and will therefore not be further alluded to here.

One effect of this rather prolonged discussion on the nature and situation of the extension of the docks has been to leave the sewers question very much in the condition in which it was in 1877. When the members of this Association last held their annual meeting in Bristol in that year, the late chief and valued colleague of the writer described at some length the system of sewers that had been constructed by his advice up to that date. In 1899 the writer, in conjunction with the late lamented Mr. W. Santo Crimp, prepared a scheme for dealing with the sewage not only of Bristol, but of the Avon Valley as far as Bath, by a discharge into the Severn; but docks were occupying the people's minds, and it has been aptly said that an Englishman can think of one thing only at a time. So it was that the popular vote was against the scheme, which will have to be revived, in probably a somewhat altered form to meet altered circumstances, before a very distant date.

The narrow, crooked streets of Bristol have truly been a byword and a reproach, but these were failings that it possessed in common with all Mediæval cities. The Corporation has kept steadily improving and widening such streets as the nature and amount of traffic required, and since your last visit in 1877 has spent nearly 1,000,000*l.* in these works, including the construction of bridges across the river, and in addition to about 200,000*l.* expended in minor improvements in setting back projections.

It was probably due to the possession of the magnificent recreation-grounds known as "The Downs" on the north-west of the city, having an area of 442 acres, which were made over

\* A paper read by Mr. T. H. Yabbicom, city engineer, at the annual meeting of the Incorporated Association of Municipal and County Engineers.



to the city before 1877, that the want of people's parks was not earlier felt; but as the population increased eastwards and southwards it became necessary to give the inhabitants of those parts spaces in which they could enjoy fresh air and amusements without going a considerable distance. The first of these public recreation-grounds was commenced in 1882, and since that date thirteen others have been added, varying in size from a quarter of an acre to 70 acres, most of them situated in the very congested districts. The total area of the public parks and open spaces is now 678 acres.

Since 1877 the baths committee have built or acquired six establishments, each having swimming baths, and is now constructing another in the east end of the city that will be provided with some of the most modern appliances that experience has shown to be necessary for the health and cleanliness of the people, including swimming, slipper and spray baths. The contracts for the builders and engineers' works amount to upwards of 16,000*l*. An electrical committee of the Corporation was constituted in 1884, who for the first few years contented themselves with marking time and watching the results of experiments made by others. In 1890 a small scheme for electric lighting was formulated and a generating station commenced at Temple Backs. The results both in street and domestic lighting were so satisfactory that the dynamo house was soon filled with machinery, and as the demand still rapidly increased, an additional and much larger site was obtained in St. Philip's Marsh and a new generating station built and equipped last year. The total capital outlay on land, building, plant, &c., to March 25 last was about 385,000*l*.; but a considerable extension of street lighting in the suburbs is to be carried out forthwith, and the electrical committee already find their new premises inadequate.

Until the year 1892 the hospital accommodation for diseases of an infectious character was totally inadequate and of the rudest character, but in that year the Council purchased a site of 13 acres at the extreme southern end, about 2½ miles from the centre of the city, at Novers Hill, intending to use it for both fever and smallpox patients, but the Local Government Board at once refused their sanction to smallpox being treated with other diseases simultaneously at the same site. It was therefore decided to use the Novers site for smallpox, and the Ham Green estate having come into the possession of the city in 1894, it was resolved to devote about 38 acres of it to the purposes of a fever hospital. The Local Government Board has sanctioned this mode of extension after much negotiation and the submission of many plans. The increase in the number of beds for patients will require a corresponding increase in the number of nurses and servants, and extra provision will be made for them by extending a wing from the back of the administration building. A high-level water tower will also be put up to insure a constant supply of water at high pressure. The cost of the works already executed and of those contemplated will amount to about 97,000*l*.

A consequence of some of the numerous street improvements effected during recent years has been the demolition of a number of small houses occupied by persons of the labouring class; and one of the conditions precedent to the Local Government Board granting authority to raise the cost of street improvement by means of a loan was the construction at suitable places of dwellings to nominally house those persons who had been dispossessed. After numerous plans had been prepared and rejected on the score of cost by the committee and as not being sufficiently palatial by the Local Government Board, a mean was struck to which the Board assented. The principle had been previously tried in Birmingham, and consisted in constructing the dwellings in blocks, those on the ground floor being quite separate from those on the first floor, the latter being approached from the street by a flight of stone steps leading to balconies giving access to the doors of the houses. The houses have in some cases three rooms and in others two rooms, but each is complete in itself. Some of the blocks front a public street with an open space at the back common to all the inhabitants, while others are built fronting a street laid out at right angles to the public thoroughfare. The accommodation in a three-roomed house calculated to shelter five persons consists of a living-room 14 feet by 14 feet, one bedroom 14 feet by 8 feet, and one bedroom 12 feet by 9 feet, washhouse, water-closet, sink and coal-bunker; these are let at 4*s*. 6*d* per week. The two-roomed houses, calculated to accommodate three persons, have a living-room 14 feet by 14 feet, and one bedroom 12 feet by 9 feet, with offices similar to those provided for the larger houses; these let at 3*s*. 3*d*. per week. Four blocks have already been built, containing an aggregate of 44 three-roomed houses and 26 two-roomed, sufficient to house 298 persons. A fifth block is in process of construction of six larger and four smaller houses to accommodate 42 persons. When completed the total number of persons that can be accommodated in the five blocks will be 340. The land on which the blocks are built was the property of the Corporation, and the cost of con-

struction, including roads and sewers, will amount to about 14,000*l*. The total weekly rents, if all the dwellings were occupied, would bring in 838*l*. 10*s* per annum, from which must be deducted rates and water. The blocks have been plainly built of sound red bricks, with window sills, window and door heads, steps, &c., of artificial stone made from Portland cement and destructor clinker. The floors are made of cement concrete, and woodwork has been reduced to a minimum.

The museum and valuable reference library in Queen's Road have been acquired for the city through the liberality of a former occupant of the civic chair, and recently the adjoining land has been purchased, on which is commenced the construction of a municipal art gallery to be presented to the city by Sir W. H. Wills, Bart. Handsome buildings have been erected at St. Philip's, St. George and Cheltenham Road, for free libraries and reading-rooms, and a small branch library opened at Stapleton, all fully equipped.

Bristol is much behind many smaller towns in not being provided with adequate municipal buildings to accommodate the various departments, who now have their offices in buildings scattered over different parts of the city, a system resulting in much inconvenience and loss of time. Since the increase in the number of the members of the Corporation in 1897 a new council chamber has been constructed at the back of the old offices in Corn Street, and a rates-receiving office and others built in connection with it.

Since 1892 the sanitary committee has carried out by day labour the works connected with highways and sewers, cleansing and watering the streets, and removal of house refuse. To enable these duties to be efficiently performed, dépôts were established at various places, the most important being that in St. Philip's Marsh, about 6 acres in extent, where is situate the refuse-destructor, stabling for 120 horses, with equine hospitals for accidents and infectious diseases, cart-sheds, workshops for making new and repairing old carts and waggons, engineering and carpentering shops, and an extensive factory for making artificial flagging. This dépôt was fully described by the writer in 1896, on the occasion of a district meeting of this Association, and as the paper was published and illustrated in vol. xxiii. of our "Transactions," it is not necessary to do more than refer to it.

Finally, the Corporation makes decent provision for deceased members of the community in two extensive and well-managed cemeteries. Concluding, he said although the municipality has not been idle during the last quarter of a century, yet the important undertakings of gas-making and distribution, water supply and tramways still remain in the hands of public companies. The gas company, unaffected by the competition of electric light, still pays handsome dividends; the water company provides a constant supply, unsurpassed in any town in England; while the tramways company was one of the first to adopt electric traction, and now serves every district of the city with a quick regular service in large well-appointed cars. The pluck and enterprise which have started and carried on successfully these great undertakings are to be admired; but it is a matter for regret that the financial advantages are not retained for the benefit of the citizens, but go to enrich numberless others whose only connection with the town is to receive their dividends from the commercial undertakings carried on in it.

## EFFECTS OF LIGHTNING ON "PROTECTED" BUILDINGS.

A SERIES of suggestions relating to the preparation of records of the effect of lightning on buildings which are supposed to be protected by lightning-conductors has been drawn up by Sir Oliver Lodge, F.R.S. They are intended for the guidance of observers who wish to aid the lightning research committee of the Royal Institute of British Architects and the Surveyors' Institution. The following information is considered to be desirable:—

1. Any signs or indications of where the flash appears to have first struck, and an account of the damage done.

2. A specification and drawing of the metalwork of the building, paying special attention to metal of every kind which comes anywhere in the neighbourhood of the conductor, whether roof guttering, lead covering, rain-water spouts, sewer ventilators, telephone wires, bell wires, gas pipes, ornamental railings, &c., carefully ascertaining whether any of these were either purposely or accidentally connected with the lightning-conductor, and if not, what their nearest distance was from it.

In the drawing all metals may be indicated in red, no matter of what kind they may be; the hypothetical path of the lightning, as appears to the observer most probable, may be sketched in in blue, remembering that bifurcation of path is not unlikely. Places of damage may be indicated by a blue swelling or patch, the size of the patch giving a rough idea of the relative damage, and an arrow being employed when necessary to call attention to any small patches liable to be



overlooked. The patches may be numbered, and the nature of the damage at each place stated in the description. Any place where fire broke out is to be specially attended to.

3. The nature and condition of the conductor, especially with reference to its continuity, its earth, and its elevation; also how fixed, and, if carried horizontally, its length as compared with the vertical height of its terminal above the ground; also note whether it made any sharp curves or loops round projections of the building, or took an indirect course. Cases of damage, where there have been more than one or several conductors, are specially important.

In the case of church steeples the wind vane should receive special attention, and the mode in which its rod terminates in the steeple should be ascertained.

In the case of chimneys any internal metal flue should be carefully specified. Likewise any indication that the flash took the column of hot air in preference to the conductor should be recorded; also whether the conductor was bent or curved over the mouth of the chimney or not.

In any case of importance the earth of the conductor should be specially examined, being, if possible, dug down to for this purpose, and a complete specification of the nature of the earth, the nature of the soil and of any metal ramifications as well as of moisture in its neighbourhood, should be made.

Any signs that the discharge has entered the earth should be recorded, and if the conductor is at any point damaged or otherwise affected this should be specified, and when interesting, a sample of the damaged portion should be sent. If the conductor has recently been examined and tested, or otherwise reported on, the fact should be stated.

### THE SITE FOR THE LONDON COUNTY HALL.

A REPORT has been prepared by the special committee appointed about two years ago by the London County Council to discover a suitable site for the erection of a new County Hall which should provide the necessary accommodation and be worthy of a body like the Council. The report recommends a site in the Adelphi. The task of finding a site had been very difficult, and the delay in bringing up a definite proposal had been due to anxiety to find one which, while being in a central and easily accessible position and of sufficient area, would not be unduly costly.

The site which has been selected contains an area of about 3.35 acres, and is bounded on the north by William Street, the Tivoli Music Hall and Adam Street, on the south by the Embankment Gardens, on the east by the Hotel Cecil, and on the west by York Buildings. The development could be confined to that portion of the site lying between the Embankment Gardens and John Street, and would probably necessitate (1) the widening of John Street from 38 to 50 feet, and (2) the widening of the street known as York Buildings from about 28 to 55 feet, in both cases the setting back being on the side of the road next to the buildings; (3) the closing of part of Adam Street; (4) the closing of Adelphi Terrace; and (5) the closing of Robert Street. A central entrance might be made in John Street, the principal floor being about 7 feet above the general level of that street. On this floor there would be ample and suitable space for the council-chamber, lobbies, committee-rooms, members' room and the rooms of the chairman, vice-chairman, deputy-chairman and those officers in immediate connection with the administrative work of the Council. Below the principal floor would be two floors of offices, and above the principal floor five floors of offices. The principal floor of the new offices will be kept at a uniform level throughout the buildings, as any change in its level would disturb the horizontal line of the elevation and necessitate steps in the corridor. If the principal floor is kept slightly above the Strand level throughout it would be about 30 feet above the Embankment. This would admit of a projection containing two storeys of offices, and could be so treated as to form a terrace along the entire south façade of the building and afford an important means of approach from the Embankment Gardens. The County Hall could thus be approached on the north from the Strand by way of Adam Street and John Street, and from Villiers Street by Duke Street and York Buildings and on the south from the Embankment Gardens. These buildings would provide accommodation for about 700 officials on a basis of 150 square feet of clear office space per officer. In addition the present buildings upon the portion of land lying between John Street and the northern boundary of the property could be used as offices, and would accommodate about 150 officials, thus making 850 in all. This latter property would be available for further extension of the County Hall if necessary. The valuer of the Council estimates the cost of compulsorily acquiring the freehold with possession of the whole of the properties necessary at 900,000*l.* The committee think this may appear to be a large sum, but considering the advantages of the site and its position they consider the Council would be

justified in incurring the expenditure. They add that, compared with that of other sites which have been considered, the cost would be extremely moderate, and such a favourable opportunity as now presents itself is not likely to occur again. The committee have not deemed it necessary to deal with the question of cost of erection, as that would be approximately the same whatever site was adopted.

In discussing the advantages of the site, the committee first point out that it possesses many advantages architecturally, as it will be bounded by three open sides and will be capable of simple and convenient planning. It would, moreover, have a frontage towards an assured open space under the control of the Council and opening upon the river. With regard to the extent of the river frontage, it is stated that it would be equal in length to the portion of Carlton House Terrace between the present central offices of the Council and the Duke of York's Column. As a second advantage it is pointed out that the site is a central one, easily accessible, extremely quiet, and has a north and south aspect. Objection has been made to placing the County Hall in, so to speak, a back street, and the committee think the objection is a strong one. It would not, however, apply to the present scheme. It would carry weight in the case of a purchaser other than the Council, as the frontages would then be behind the Strand; but, as the Council was able to secure adequate approaches from the Strand, and would also be able to use the important frontage openings upon the Embankment Gardens and the river, this objection is no longer valid. Thus the site is of greater utility to the Council than to any one else. There is also an important fact which bears upon this point. During recent years the School Board, the Asylums Board, the Thames Conservancy Board and the Metropolitan Police have located themselves on the Embankment. The selection of the proposed site for a County Hall would still further identify the Embankment as the recognised quarter for public buildings, while the existence of Somerset House and the Houses of Parliament on the same frontage lends an additional weight to this point. The committee add that this is the last opportunity of obtaining a central site of this dimension facing the river.

In conclusion, the committee state that they cannot too strongly urge upon the Council the need for new offices. At present the staff was scattered, and requests for additional office accommodation were continually being made, while the difficulties in meeting the demand daily increased. Too much stress could not be laid upon the serious disadvantages to the Council in continuing to rent outside premises, which could now only be obtained with great difficulty and at very high terms. Even those which could be obtained necessitated a large expenditure of money in alterations and fitting up to make them at all suitable for the Council, while the frequent changes that had to be made owing to the offices not being firmly established had caused considerable expense and inconvenience. The present condition of affairs prevented proper administration, and, in fact, it was impossible to estimate in money value the loss which was now sustained by the present inadequate and scattered office accommodation. The site they now proposed would afford sufficient area for a County Hall which would meet the requirements of the Council and be worthy of the central municipal authority of London. The report concludes with a recommendation that Parliamentary powers should be sought for the compulsory acquisition of the property necessary for the purposes of the new offices.

### SHROPSHIRE ARCHÆOLOGICAL SOCIETY.

THE annual excursion in connection with the Shropshire Archæological and Natural History Society was held on the 15th inst. The party left Shrewsbury by the 10.5 A.M. train, and on arriving at Craven Arms shortly before eleven, entered carriages and proceeded to Clundury Church, an interesting description of which was given by the vicar (the Rev. W. G. Clark-Maxwell, F.S.A.). The edifice is aisleless, of Transitional Norman architecture, dedicated to St. Swithin, and contains several interesting features, particularly a fine fifteenth-century oak roof. At noon the carriages were re-entered and the journey continued to Clun. Here the church was first visited, and its architectural features and history were very lucidly explained, in the absence of the Vicar, by the Rev. A. M. Auden. It is a large church, of the same period as Clunbury, but has been partly rebuilt. A perpendicular oak canopy at the east end of the roof is a noticeable feature. Afterwards the party inspected the ruins of the castle, and the Rev. T. Auden (chairman of the Council of the Society) gave a short and attractive outline of its history. It was formerly the stronghold of the Earls of Arundel, and apparently succeeded a fortification of much earlier date on the same site. The remains consist of a Norman keep. The ruins have recently been purchased by the Duke of Norfolk, and have, therefore, after a lapse of many years, returned to the Arundel family. Subsequently a visit was paid to the Hospital of the Holy Trinity, which was founded in 1614. At 2.30 the carriages left for



Lydbury North, passing, by kind permission of the Earl of Powis, through Walcot Park. The church at Lydbury North, which is in the course of restoration, was described by the Revs. T. Auden and A. M. Auden, who also drew attention to several interesting events in its history. The edifice is of various dates. The seventeenth-century pewing, the font and its cover, and the fittings of the Plowden chapel were much admired. Notwithstanding the excessive heat, five members walked over the hill from Clun to Lydbury North, and on the way inspected the large camp known as Bury Ditches. They joined the carriages at Lydbury North, and the whole party then proceeded to Plowden Hall, where the house and its numerous treasures—forming an art gallery and museum of great interest—were kindly shown by Mr. W. F. Plowden, who afterwards entertained his visitors to a refreshing tea, after which the party returned to Shrewsbury.

### TESSERÆ.

#### Roubiliac's Statue of Shakespeare.

THE statue of Shakespeare by Roubiliac which is in the British Museum was commissioned by David Garrick, and was first placed in his garden at Hampton. The price was fixed by the player at the parsimonious sum of 300 guineas. Garrick was eminently skilful in the art of bargain making, and persuaded the enthusiastic sculptor to undertake the work at a price which would barely cover the model and the marble. Now he who works with the consciousness that he is to be a loser seldom exerts himself like one under the double inspiration of fame and money, and Roubiliac could not but be sensible that he was to be out of pocket. Besides, the artist who carved stone under the auspices of Garrick was not likely to have much of his own will; the great player was a resolute "chipper and hewer" in dramatic compositions, and having not only represented the chief characters, but altered and recast whole pieces, of our great poet, he no doubt thought himself thoroughly qualified to dictate respecting his person. It is said that he put himself into countenance, and then into posture, and desired the astonished sculptor to model away—"for behold," said he, "the poet of Avon." This tradition is countenanced by the vanity of Garrick, and by the story related of him respecting Hogarth's portrait of Fielding. The sculptor, who had promised to carve the statue in the best marble he could afford for the price, cut it from a block hard indeed and durable, but full of faint veins, which, crossing the eyes probably or the mouth, communicated a sinister expression to the whole face. "What," exclaimed Garrick, "was Shakespeare marked with mulberries?" Roubiliac hewed the objectionable head from the shoulders, and replaced it with one of purer marble, and his patron was satisfied. From an inscription on the pedestal it appears that the statue was finished in 1758.

#### Light and Shade.

The vocabulary in use relating to light and shade is utterly inadequate to convey that knowledge of its phenomena that a painter requires. It comprises merely the terms "light," "shade," "reflection," "half-light" and "half-shade." Now all lights, with the exception of those belonging to objects self-luminous, as fire, the sun, &c., are either reflections of light from the surfaces of bodies or transmission of light from those that are transparent or partially so. The focus of light on a globe is, therefore, as much a reflection as that appearance on its shadowed side which, in ordinary language, is called the reflection, and as to the terms half-lights and half-shades, they but express, if literally understood, single degrees among the endless gradations from light to dark. It has been said that water receives no shadow, but this is either equally true of all other bodies or not true of water, which is undoubtedly subject to effects that we cannot otherwise describe than by the word shadow. When, for instance, the sun is shining on the sea, were it possible that the water could be as smooth as a mirror, we should see his disc exactly reflected, and once only, the surface of the water in other places giving an inverted image of the sky; but as such perfect stillness never occurs the light of the sun is spread on the surface by innumerable broken reflections from the waves and refractions through them, the spaces between each of these lights (as we call them) reflecting the sky, where again the upper parts of the clouds reflect the sun, and other portions of the blue sky or the sea. The blue of the sky is occasioned by still more minute reflections and refractions of the sun from and through particles of vapour more subtle than those which compose the clouds, and but for which in place of the azure there would probably be a void of utter darkness. Where clouds or other objects intercept the reflections of the sun from the waves the reflection of the sky remains, causing those patches of shadow which, seen from a low point, stripe the sea with long lines of blue. It is scarcely necessary to remark that the shadows we see distinctly on the surface of muddy water are projected on the mud within

the water, and not on the water itself, as on the face of a looking-glass very faint shadows may always be cast, but these are either on minute particles of dust or some slight degree of vapour, or on scratches invisible to the naked eye, from all of which the cleanest and most highly polished mirror is never wholly free.

#### Northern Metalwork.

Copper was a metal known to the Germanic nations before iron had been heard of, and as they were in the habit of mixing it with a little tin, the compound has received the name of bronze. It is not to be imagined that articles of bronze found in Northern Europe were imitations of Roman, &c., inasmuch as they are found just in the provinces most remote from Roman influence, Scandinavia in particular; and besides, by the time that constant traffic was established between Rome and inner Germany under Julius Cæsar the Romans had long been making their sharp instruments of iron. Gold is also frequently found at this stage of progress, but silver seems to have been a later luxury. In Northern Europe many swords, battle-axes, daggers, spears, arrow-points, shields, helmets war-trumpets (these latter very remarkable for size and execution, some having been found in mosses, fags, &c., so well preserved that they could be sounded), spurs, bits and other horse-gear, knives, saws, drinking-cups, vases, spoons, keys, &c., all of bronze, occasionally ornamented with gold. Large rings of pure gold and immense value have been found, too wide for the wrist and rather small for the neck, not to speak of their weight, which is enormous; on one side there are two excrescences which would also make them inconvenient for wear; they are supposed to be the rings used in swearing, of which mention is made in the Sagas. A man held out the ring in his hand, whereon he that was to take the oath grasped it in his. Magnificent drinking-horns of the purest gold have been met with, of which the value is incredible; they measure near a yard in length, and are most elaborately ornamented with figures of all kinds. The hair ornaments are remarkable for their size and specific gravity; there are metal crowns and helmets, in wearing which the ladies of those days must have borne some inconvenience for the sake of the fashion.

#### Imported Art.

When the Romans came and made themselves lords of Greece, they gradually learnt to admire an art that in its long since complete and perfect shape seemed to form a world by itself, that had not needed the co-operation of the moral forces for its rise and prosperity. They took possession of its products as spoils of victory and means of enjoyment, and turned contemptuously aside from the humble expressions of a plastic sense in their own countrymen and nearest neighbours. But true as it is that various ages and various peoples have to learn of each other, it must be equally true that an art imported from without, which stifles in the germ another that is trying to spring up from native dispositions, cannot wholly and entirely be set down on the side of an intellectual gain—so long as it has not been proved that this art may be transplanted from the forcing-house of higher education into common earth, acclimated, and so become part of the people's intellectual economy, as foreign grains are of its material. But that this takes place is extremely rare. Rome and Italy were stocked with Grecian works of art: markets, basilicas, temples, baths, houses boasted of such. The race grew up among them, and, nevertheless, the Romans remained at bottom, strangers to the spirit of Hellenic art. An imported art has something that wounds national feeling; the people have a dim perception that injustice has by this introduction been done to themselves and their undeveloped resources. With some the feeling becomes a suspicion that art is the foe of moral simplicity—the majority conceive her as a plaything for the rich and high born. And while it needs a subtle eye to discover her undoubtedly exalting influence, it cannot be denied that she widens the cleft between the classes, gives their education in degree and quality a difference that is not healthy.

#### Materials of Ancient Sculpture.

The sculptors of antiquity occasionally introduced a variety of materials in the same work. When various marbles were used it was called "poly lithic" sculpture, in distinction to sculpture in a simple material or stone (monolithic). In the period of the greatest glory of sculpture the union of gold with ivory was resorted to. The favourite material for works in statuary with the ancients seems to have been bronze; and we can only account for the comparatively small number of works remaining in it by the various uses to which the metal could be applied; on this account it offered great temptation to the spoiler. The mixture used was copper and tin, which is called "bronze," probably from its brown colour. The term is taken from the Italian writers. The green tint usually seen on bronze is produced by acid, either by natural oxidation or by artificial means. The mixture of bronze was much studied by the ancients. Modern sculptors have occasionally varied the



proportions of their bronze since the use of zinc has been known. It was a custom of the ancients to insert eyes in their statues of different materials from the rest of the work; usually they were of silver, but precious stones and paste have also been found. Inscriptions in silver letters were sometimes inserted in figures of bronze. Specimens of this practice exist in all collections of bronzes. Some of the ancient writers refer to tinted bronzes, and describe the effect of paleness or of blushing being produced by the peculiar commixture of the different metals. In a statue of Athamas sitting, after the murder of his son, in order to express the effect of confusion and shame a mixture of iron is said to have been used with other metals, and that the change of the ferruginous parts caused an appearance like a blush. Plutarch speaks of a statue by Silanio in which, by a peculiar mixture of metals, a paleness was spread over the countenance. Callistratus describes a statue of Cupid, by Praxiteles, which had a vivid blush on the cheeks. The combination of metals in this way appears so inconsistent with known relations that the accounts referred to must in most respects be treated as mere fancies or inventions of their authors. Colour was undoubtedly extensively used to heighten the effect. Monochromic sculpture was that in which a simple or one colour only was used.

### UNIVERSITY COLLEGE.

THE following prizes have been awarded in the Section of Architecture, by Professor T. Roger Smith:—Fine Art: Donaldson Silver Medal, C. W. Kilner, of Bury St. Edmunds.—Construction: Donaldson Silver Medal, H. W. Chapman, of London. 2nd Prize, R. M. Hilton. *Second Class*, Kuo Tung, of Pekin.—Classes maintained by the Carpenters' Company:—Measuring and Estimating: Elementary Class, Prize, C. L. McDougal, of London. *Second Class*, J. F. Willson, of London. *Third Class*, D. Bradford, of London; H. Walker, of London.—Advanced Class: Prize, R. H. Mayhew, of London. *Second Class*, J. W. Hutton, of London; S. G. Peartree, of London. *Third Class*, S. M. Deacon, of London; S. J. Durden, of London; G. L. Green, of London; W. H. Lamble, of London; B. Stapleton, of London.—Building Construction and Drawing: Elementary Class, 1st Prize, C. G. Blomfield, of London; 2nd Prize, F. T. Foxcroft, of London; 3rd Prize, W. H. Williams, of London. *Second Class*, J. T. Vivian, of London.—Advanced Class: 1st Prize, F. H. Hodson, of London; 2nd Prize, H. W. King, of London; 3rd Prize, G. Wiggins, of London. *Second Class*, L. A. Jarvis, of London; C. A. Sheppard, of London.

### GENERAL.

**The Painters** who are candidates for the membership of the Académie des Beaux-Arts, in succession to the late Benjamin-Constant, are MM. Gabriel Ferrier, François Flameng, Henri Gervex, Ferdinand Humbert, Lhermitte, Albert Maignan and Toudouze.

**The Joint Engineering Commission** appointed by the Cape Government recommends an extension of the harbour works in Table Bay at a cost of 3½ millions sterling.

**The County of Cheshire** and the city of Chester are uniting to commemorate Queen Victoria by erecting a statue to her memory in front of the Chester Castle Law Courts. Sir Horatio Lloyd informed the Cheshire Standing Joint Committee on Saturday that a sculptor had been selected and a contract had been entered into with him to execute the statue for 1,350*l*. The statue, he added, would be of bronze with a grey pedestal.

**The Prefect of the Seine**, acting on the report of M. Bouvard, the architect, has awarded prizes to the following houses as being the most worthy of those examined in 1901:—201 and 201 bis Boulevard Saint-Germain, 40 Rue Condorcet, 4 Rue de l'Abbaye, 29 Avenue Rapp, and Place des Saussaies.

**Mr. James Green**, of Messrs. Weatherall & Green, has been appointed for the fifteenth year in succession chairman of the assessment committee of the Borough of Kensington.

**The Epping Forest Committee** of the City Corporation, after paying a visit of inspection to Hainault Forest and Lambourne Common, have issued a report in which they recommend that the Court of Common Council should vote 10,000*l*. towards the purchase of the properties, which comprise over 800 acres. The Corporation will be asked to take over the management of the proposed new area.

**The Fortifications** of Thionville, in Alsace-Lorraine, consisting of eleven bastions covered by some outer works and by a fort on the right bank of the Moselle, are to be demolished.

**The Foundations** of the new buildings for the University of Birmingham were commenced last Monday. The design

for the general scheme has been prepared by Messrs. Aston Webb & E. Ingress Bell.

**The Damage** caused by the Martinique disaster is estimated by a French Government commission at 200,000,000 francs.

**The Congress** of the Iron and Steel Institute will be held during the first week of September at Düsseldorf, where an important industrial exhibition is now open.

**The Westminster City Council** are about to apply to the London County Council for sanction to borrow 92,950*l*.—of which 70,000*l*. will be repaid by the County Council on completion—for the widening of the Strand from Nos. 89 to 104, both inclusive.

**An Instruction** has been adopted by the House of Commons to the following effect:—"That it be an instruction to the committee on the Charing Cross, Euston and Hampstead Heath Railway (No. 1 and No. 3) Bill to inquire and report whether the railway proposed to be authorised by the Bill, if constructed on the lines mentioned, will not seriously injure Hampstead Heath, under which it is to pass, by tapping the wells, draining the soil, destroying the verdure and interfering with this public place of resort, and that the committee have power to call witnesses and receive evidence on the subject."

**Lord Kitchener** sold to Lord Milner all the blockhouses at 10*l*. apiece. There are 6,000, extending over a vast territory. Lord Kitchener points out that as Lord Milner has to rebuild farmhouses he cannot do better than have the timber, corrugated iron and other material ready to his hand.

**The Foundation-stone** was laid on Saturday of a new parish hall at Vickerstown. The hall is the gift of Messrs. Gradwell & Co., builders and contractors, Barrow, and will have sitting accommodation for 300 persons. The hall has been given to the parish as a gift to commemorate the accession of King Edward.

**Mr. Chevallier Taylor** is to paint a panel in the Royal Exchange which will represent the entertainment which was given by the Vintners' Company in 1356 to the five kings—Edward III., David II., John of France and the Kings of Denmark and Cyprus.

**Mr. G. E. Smith**, of Portsmouth, is the architect for the Board school to be erected in Eastney, as well as for the Portsmouth Technical Institute.

**Mr. A. E. Christie** has been appointed inspector of art schools and classes under the technical education board of the London County Council. Mr. Christie is a professional designer of furniture, upholstery, metalwork, wall-papers, &c., who has been employed as teacher of design at the Council's central school of arts and crafts.

**The Court of Common Council** having received a letter from the London County Council asking the Corporation to join them in an application to the Government to promote legislation in the next session of Parliament for regulating the breaking up by companies and others having statutory rights in the London thoroughfares, it was resolved to inform the Council that the Corporation was prepared to co-operate with them in the matter on the understanding that the Corporation retained complete and absolute control over the streets in the City.

**M. E. Fremiet's** equestrian statue of the Mediaeval warrior *Du Guesclin* was unveiled on the 20th inst. at Dinan. The work was conveyed direct from the Salon to its destination, a distance of 220 miles, by a powerful motor-car.

**A Conference** on garden cities will be held in Liverpool to-day and to-morrow under the presidency of Mr. W. H. Lever. On the latter day the delegates will visit Port Sunlight.

**The Annual General Meeting** of the British Association of Waterworks Engineers was held this week at Leicester under the presidency of Mr. Frederick Griffith.

**The Syllabus** of the day courses of instruction in architecture in connection with the Architectural Association for the session 1902-3 has been issued. The winter term commences on September 29. It states that the result of the first year's working has fully come up to the anticipation of the committee both in the number of the students and in the practical results in the work of the school.

**An Exhibition** of Japanese art was opened on Wednesday in the Whitechapel Art Gallery. It contains lacquer, carvings in wood and ivory, porcelain, bronzes, drawings and coloured prints, many of them of remarkable quality.

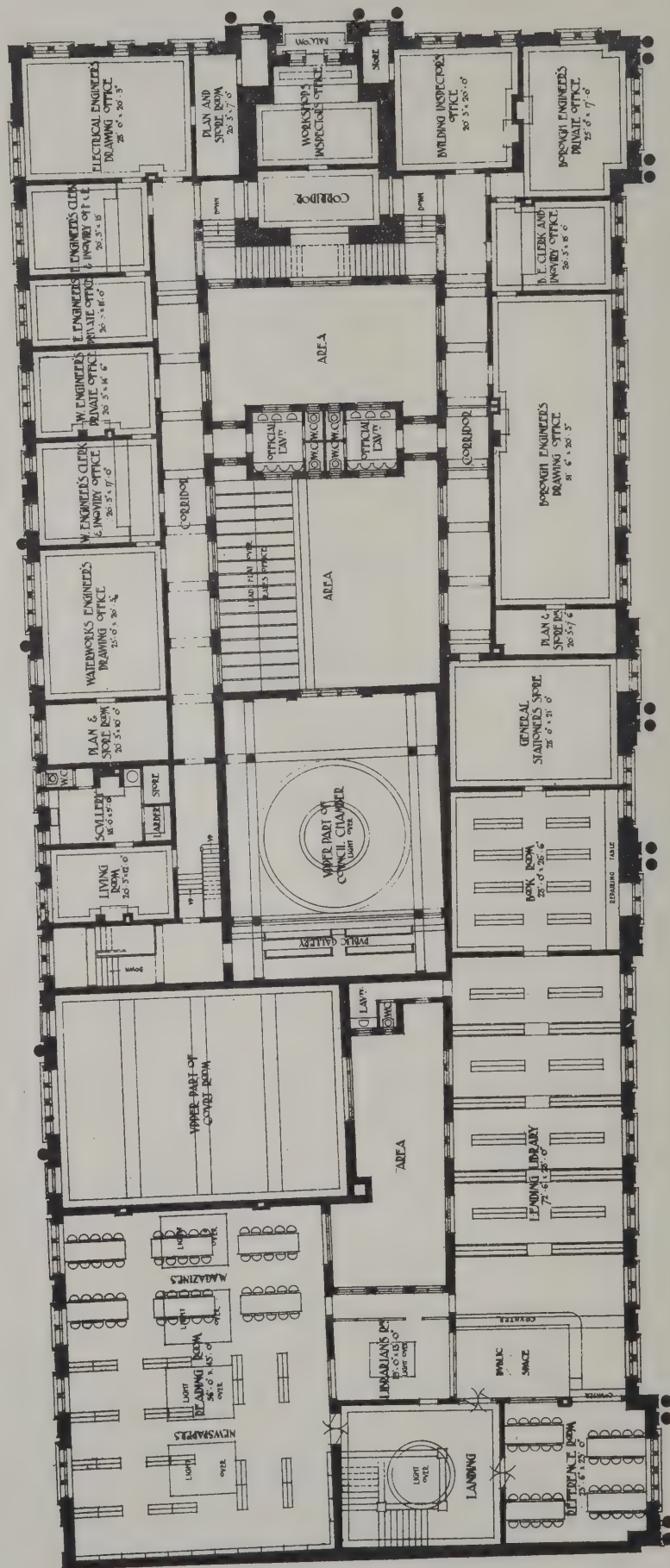
**The Executive Committee** of the Twentieth Century Fund of the Wesleyan Conference have decided to purchase the Westminster Aquarium as a site for their central Church House. The building is to be of a monumental character. It will contain a great hall capable of holding 3,000 people, and having an area of 40,000 square feet; a lesser hall to hold 1,000 people and a great library. The sum to be paid is about 330,000*l*. Any part not required for the new buildings will be resold.



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PARROGATE  
TOWN HALL



**FIRST FLOOR PLAN**

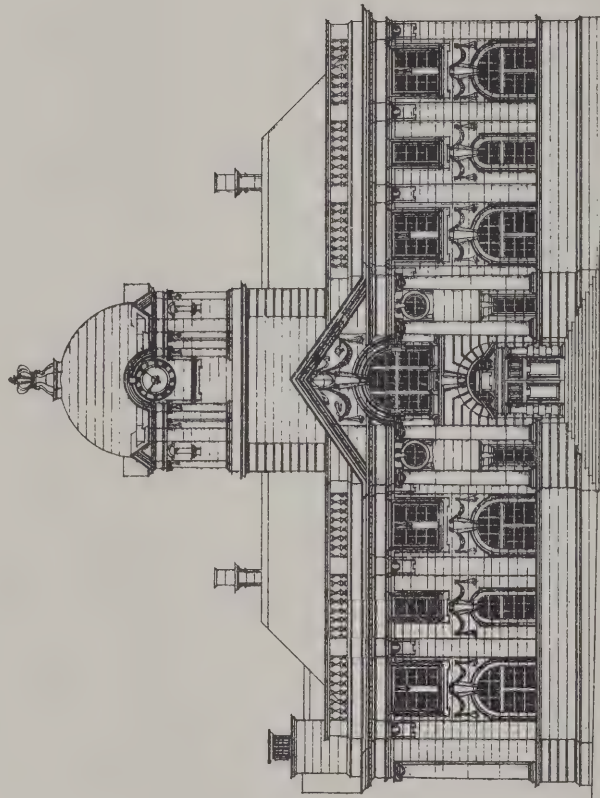
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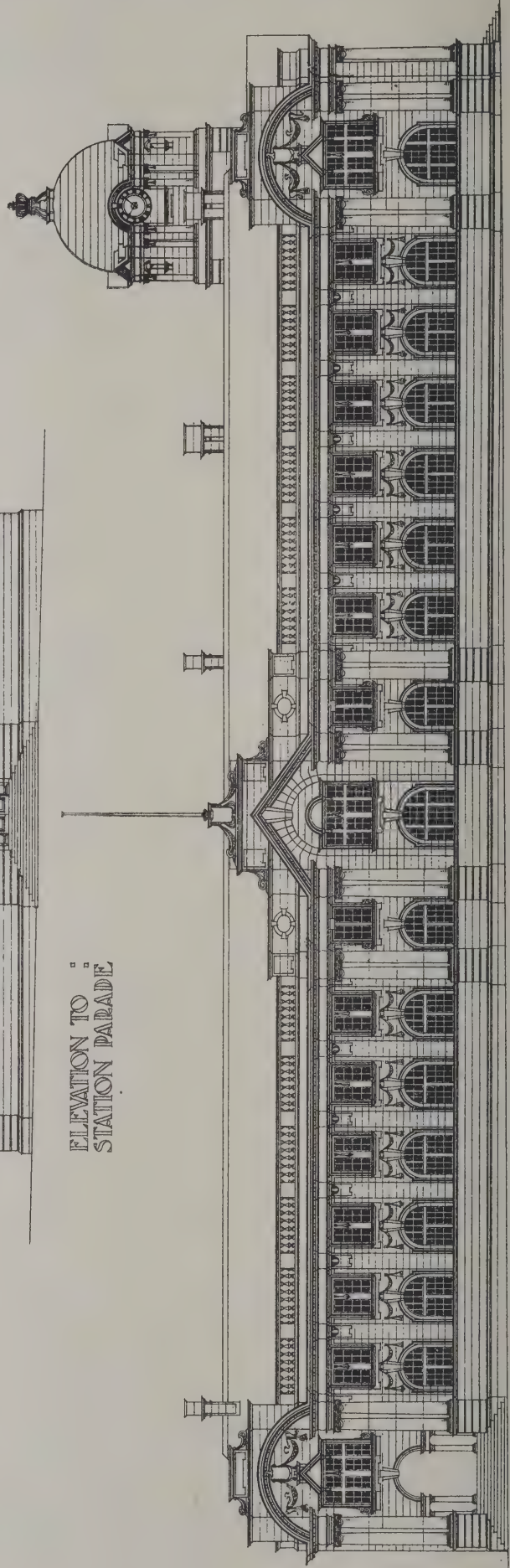
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HARROGATE  
TOWN HALL



ELEVATION TO  
STATION PARADE



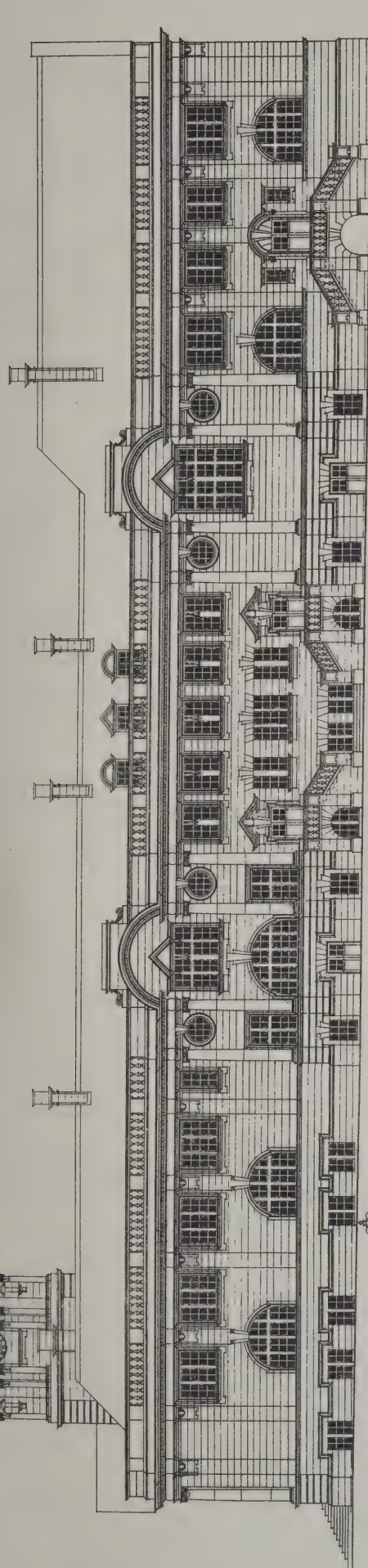
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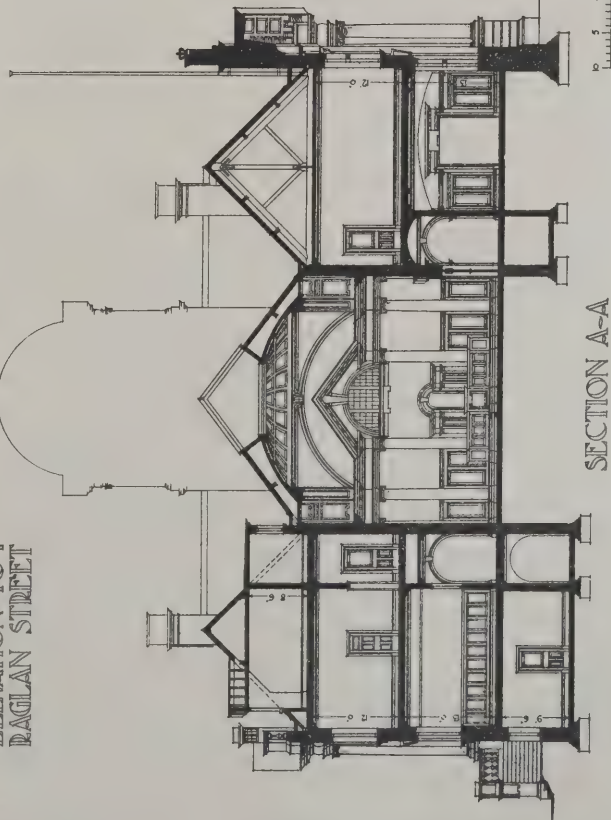
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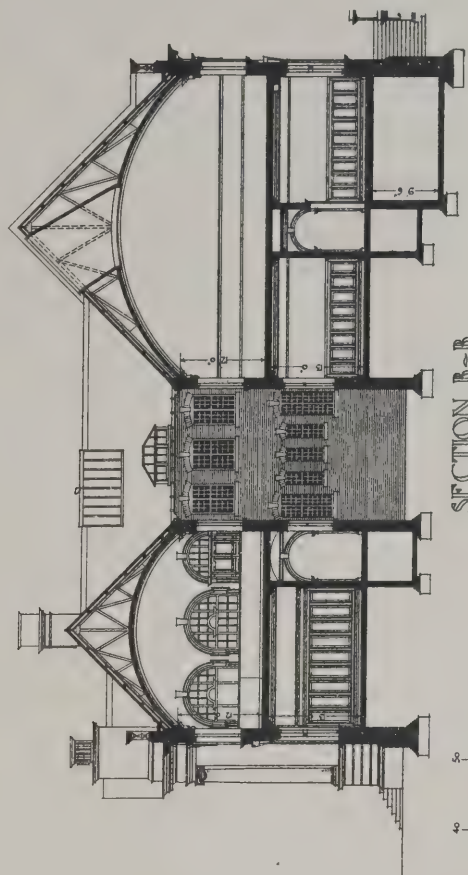
HARROGATE  
TOWN HALL



ELEVATION TO  
RAGLAN STREET



SECTION A-A



SECTION B-B

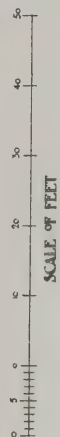


PHOTO LITHO. SPRAGUE & CO. LTD. 4 & 5, EAST HARROGATE STREET, FETTER LANE, E.C.

THIRD PREMIAED DESIGN.

By Messrs. HEAZELL & SON.



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## PAGIAN



A vertical scale of feet, ranging from 40 to 80. The scale is marked at intervals of 10 feet: 40, 50, 60, 70, 80. The text "SCALE OF FEET" is written vertically along the right side of the scale.

VICTORIA

GROUND  
FLOOR  
PLAN :

### THIRD PREMIATED DESIGN.

By Messrs. HEAZELL & SON.



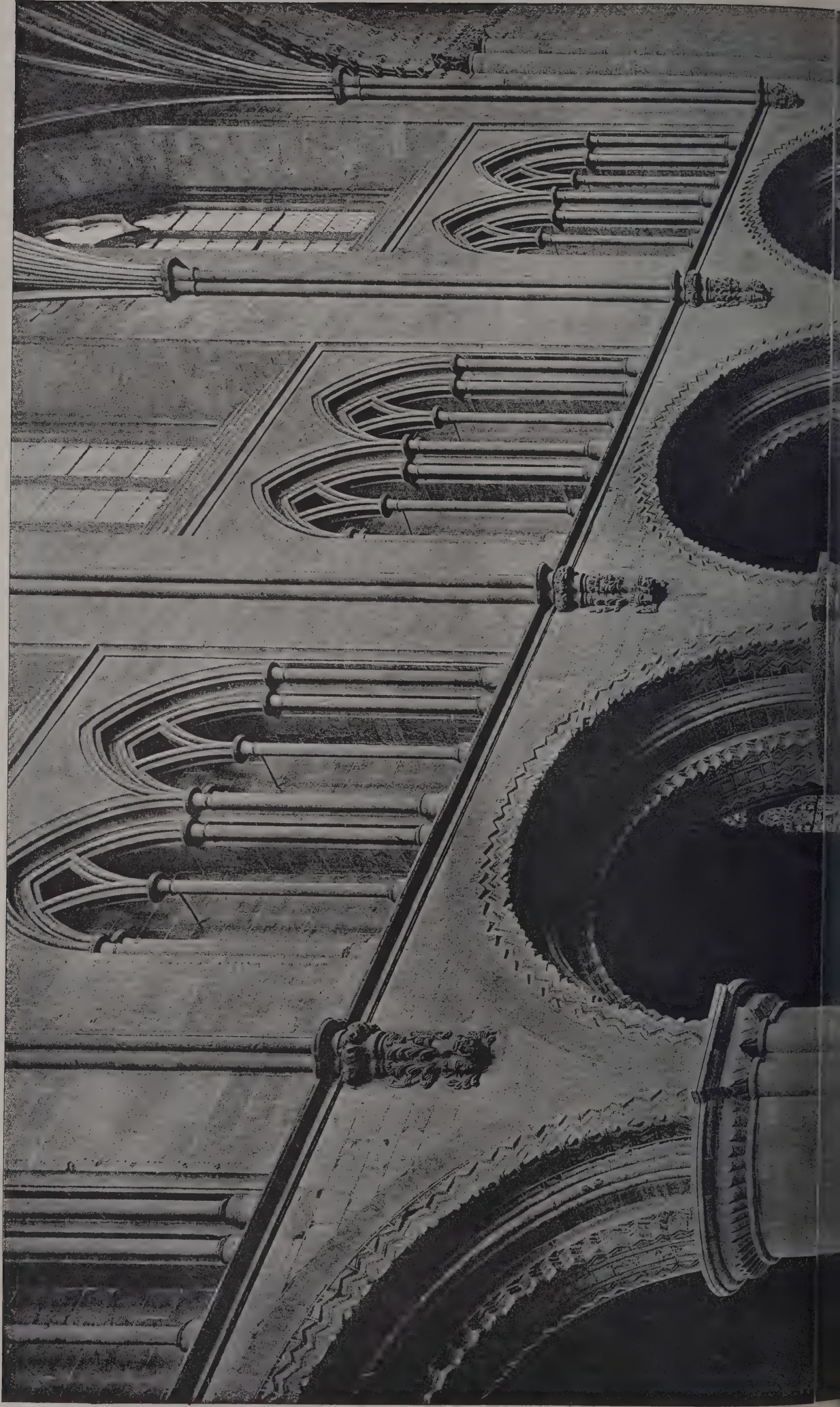
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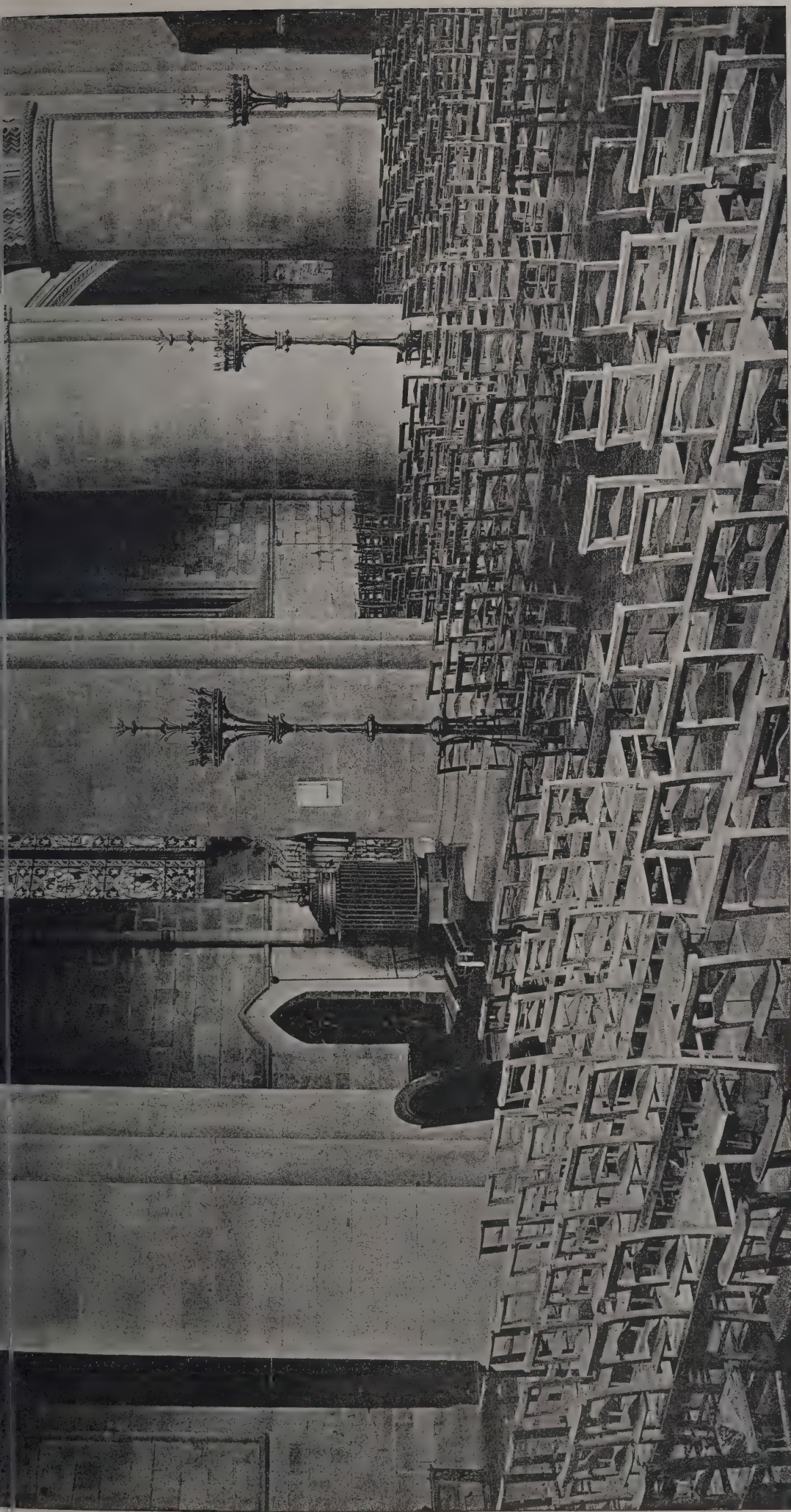
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The Architect, July 25<sup>th</sup> 1902.







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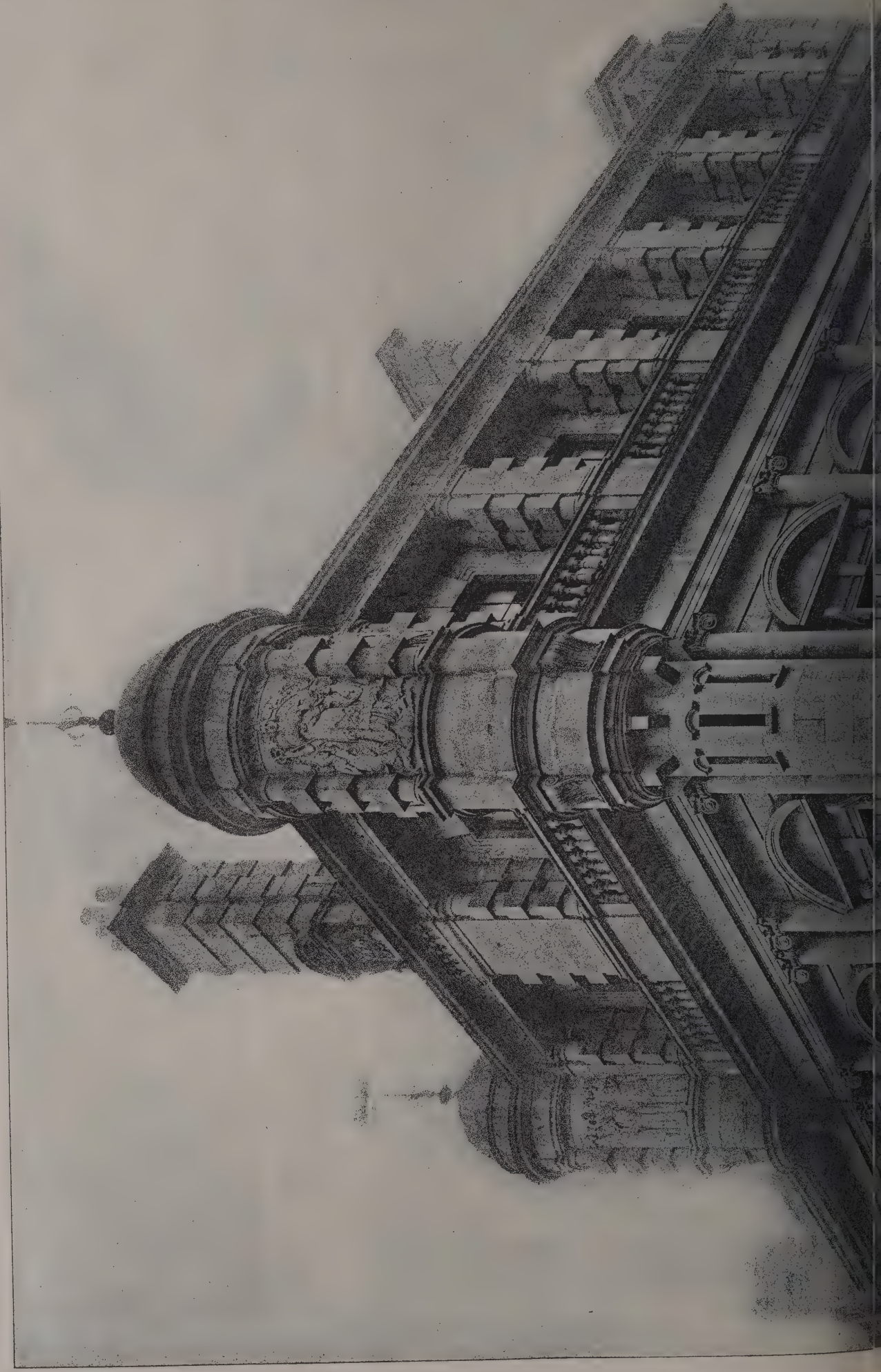
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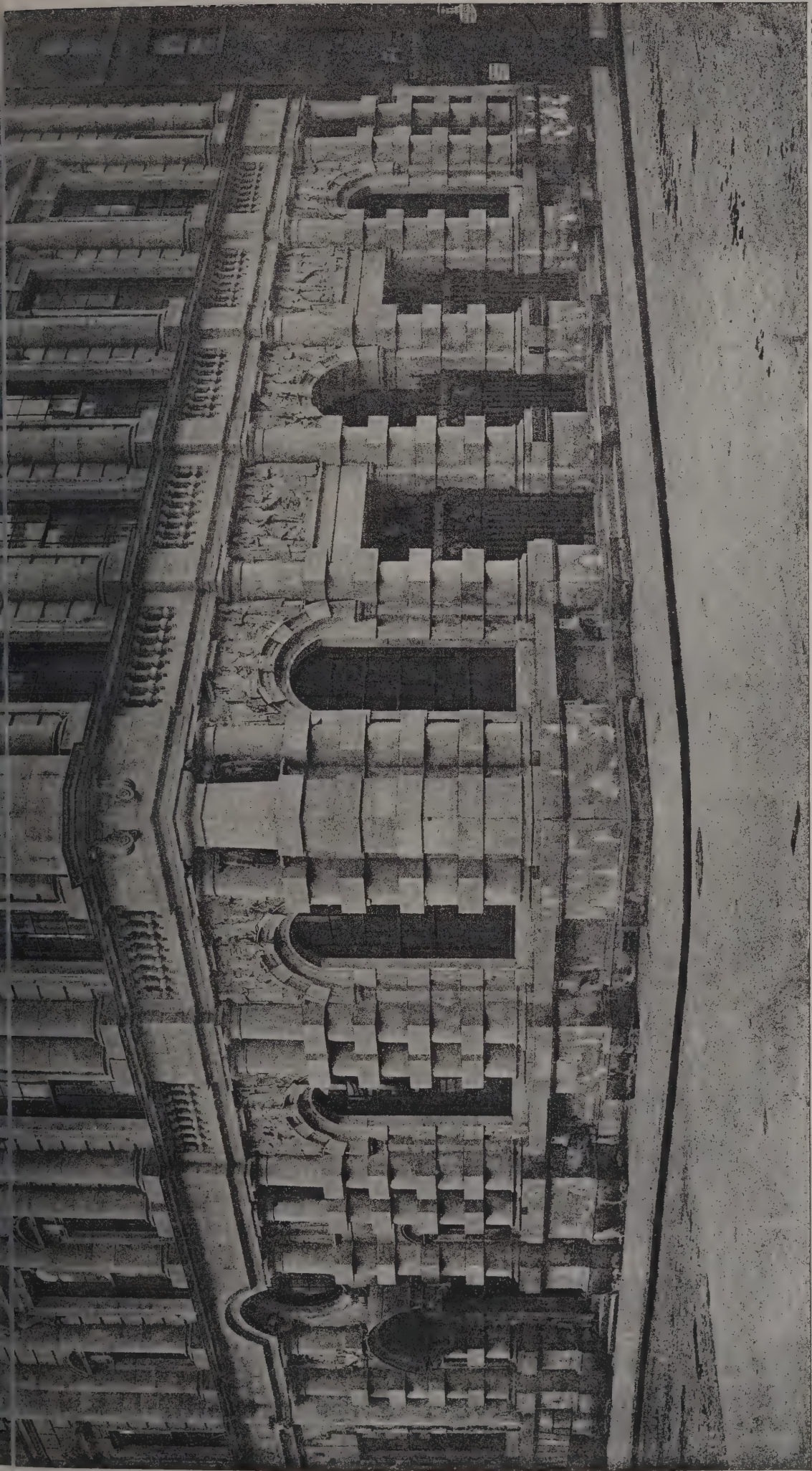
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The Architect, July 25<sup>th</sup> 1902.







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T. E. COLLCUTT, F.R.I.B.A., Architect.



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THE

**Architect and Contract Reporter.****EDITORIAL NOTICES.**

*In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

**TENDERS, ETC.**

*\*\* As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

**COMPETITIONS OPEN.**

**BERMONDSEY.**—Sept. 16.—Designs are invited for artisans dwellings to be erected on land at Rotherhithe, within the borough of Bermondsey, and known as the Fulford Street area. Premiums of 100*l.*, 60*l.* and 40*l.* will be awarded. Mr. Fredk. Ryall, town clerk, Town Hall, Spa Road, S.E.

**BIDEFORD.**—Sept. 25.—The Town Council of Bideford are about to erect municipal offices and a public library upon a site opposite the west end of the Long Bridge, Bideford, and they invite designs for the proposed buildings. Premiums of 30*l.*, 15*l.* and 10*l.* respectively are offered for the designs which shall be placed by the Council first, second and third in order of merit. Designs and descriptions, &c., are to be delivered to Mr. Wm. B. Seldon, town clerk, 18 The Quay, Bideford.

**BRISTOL.**—Designs are invited for new central library. Mr. Edmund J. Taylor, town clerk, Council House, Bristol.

**DEPTFORD.**—Aug. 30.—Competitive designs are invited for a town hall and municipal offices. Premiums of 100*l.*, 75*l.* and 50*l.* are offered for the three selected designs. Mr. Vivian Orchard, town clerk, Municipal Offices, 20 Tanner's Hill, Deptford S.E.

**GRANTHAM.**—Designs are invited for the erection of a cottage home for nurses, to be erected at Grantham. A premium of 5*l.* 5*s.* will be paid for the selected design. Town Clerk, Grantham.

**INDIA.**—Nov. 1.—Competitive designs are invited for the erection of a memorial to Her Majesty the late Queen Victoria at Allahabad. A premium of 2,000 rupees will be awarded to the design selected by the committee. Mr. H. Nelson Wright, Indian Civil Service, honorary secretary, Queen Victoria Memorial Fund Committee, Allahabad, India.

**IRELAND.**—Aug. 1.—The Newtownards Urban District Council invite tenders from competent engineers to take levels, prepare plans, sections, specifications and estimates for all works necessary to provide properly constructed and ventilated sewers for the town of Newtownards. Mr. H. M'Cartney, clerk, Newtownards.

**LIVERPOOL.**—Sept. 15.—Designs are invited for new labourers' dwellings to accommodate about 2,500 persons, to be erected on the Hornby Street area. Premiums of 250*l.*, 150*l.* and 100*l.* respectively are offered for the first three selected designs. Particulars will be supplied by the Town Clerk.

**SOUTHEND.**—Sept. 7.—Designs are invited for a church to accommodate 500 persons, a clergy-house, and a parochial hall or parish-room about 50 feet by 30 feet. Mr. C. H. J. Talmage, Kathleen Villa, Southchurch Road, Southend-on-Sea.

**SUNDERLAND.**—Aug. 30.—Designs are invited for proposed police and fire-brigade buildings to be erected in Gill Bridge Avenue and Dun Cow Street. Premiums of 100*l.*, 50*l.* and 25*l.* are offered for first, second and third designs respectively. Mr. Fras. M. Bowey, town clerk, Town Hall, Sunderland.

**CONTRACTS OPEN.**

**ARDSLEY.**—For plastering, blue slating and plumber and glaziers work in eight scullery houses at Station Lane, Ardsley. Messrs. Newton & Asquith, architects, Ackroyd Street, Morley.

**BISHOP'S STORTFORD.**—Aug. 4.—For additions to the isolation hospital at Bishop's Stortford. Mr. E. T. Watts, surveyor, Thorley, Bishop's Stortford.

**BISHOP'S STORTFORD.**—Aug. 11.—For erecting boundary-wall 600 feet in length by 8 feet high at the gasworks. Mr. W. J. Gee, secretary, Water Lane, Bishop's Stortford.

**BLACKAWTON.**—July 28.—For restoring large barn, &c., at Lower Fuge, Blackawton, Devon. Mr. E. H. Back, architect, Dartmouth.

**BRADFORD.**—July 30.—For erection of laundry, boiler-house and chimney, stabling, &c., in Barnard Terrace, Usher Street, Bradford. Mr. Wm. Rycroft, architect, Bank Buildings, Manchester Road, Bradford.

**BRADFORD.**—July 31.—For erection and completion of new central baths and public hall at Morley Street, Bradford. Mr. Frederick Stevens, town clerk, Town Hall, Bradford.

**BRADFORD.**—Aug. 6.—For erection of a store and three houses in Great Horton Road and Summerville Road, Bradford. Mr. Wm. Rycroft, architect, Bank Buildings, Manchester Road, Bradford.

**BRENTWOOD.**—Aug. 1.—For erection of a fire station in Hart Street, Brentwood. Mr. J. E. Fothergill, surveyor, Brentwood, Essex.

**BRISTOL.**—July 28.—For erection of a cemetery chapel at Canford Lane, Westbury-on-Trym. Messrs. La Trobe & Weston, architects, 20 Clare Street, Bristol.

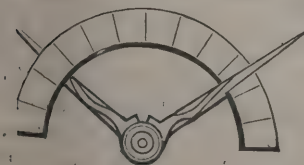
**BRISTOL.**—July 28.—For extensions to the Ham Green hospital, Pill, Bristol, comprising two pavilions, discharging block, additions to administration building, &c. Mr. T. H. Yabbicom, city engineer, 63 Queen Square, Bristol.

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CARLISLE.—Aug. 1.—For erection of grand stands, &c., for the Carlisle Race Stand Company, Ltd. Mr. Joseph Graham, architect, Bank Street, Carlisle.

CHAPEL-EN-LE-FRITH.—For erection of a block of four cottages at Chapel-en-le-Frith. Messrs. Garlick & Flint, architects, Buxton.

CHELMSFORD.—July 29.—For erection of a drill hall at Chelmsford. Captain Fred Taylor, 17 Duke Street, Chelmsford.

CHESTER.—Aug. 5.—For alterations at Upton Asylum, Chester. Mr. H. Beswick, county architect, Chester.

CHESTERFIELD.—Aug. 9.—For construction of a new main outfall sewer at Cresswell, for the Clown Rural District Council. The works will comprise about 1½ miles of 12-inch stoneware pipe sewers, together with all manholes, ventilators, flushing arrangements and other appurtenances. Mr. James Snow Whall, clerk, 44 Bridge Street, Worksop.

CHESTERFIELD.—Aug. 11.—For erection of infirmary, nurses' home, laundry and other works at the workhouse, Newbold Road, Chesterfield. Messrs. Rollinson & Son, architects, 13 Corporation Street, Chesterfield.

CROSSGATES.—July 30.—For erection of station buildings, platform roofing, warehouse, stationmaster's house and cottages at Crossgates, Yorks, for the North-Eastern Railway Company. Mr. William Bell, architect, York.

CROSLAND MOOR.—July 31.—For erection of two dwelling-houses in Park Road West, Crosland Moor, Yorks. Mr. Arthur Shaw, architect, Golcar.

DARLINGTON.—July 31.—For erection of seventy workmen's houses in connection with Messrs. R. Stephenson & Co.'s works, Darlington. Mr. W. Y. Dixon, Estate Office, Baltic Chambers, West Hartlepool.

DARTFORD.—July 30.—For excavation and brickwork setting for one Lancashire boiler at the electricity works. Mr. J. C. Hayward, clerk to Urban District Council, Sessions House, Dartford, Kent.

DERBY.—For erection of Baptist church, vestries, &c., Pear Tree Road. Mr. A. H. Goodall, architect, Market Street, Nottingham.

EALING.—July 31.—For erection of a lodge at the southern entrance, Lammas Park. Mr. Chas. Jones, surveyor, Town Hall, Ealing, W.

FLOCKTON.—July 28.—For erection of draper's shop and three cottages at Flockton. Mr. R. H. Sowerby, Industrial Co-operative Society, Flockton.

GILLINGHAM.—For extension of the electricity works in Gillingham Road, Gillingham, Kent. Mr. W. H. Trentham, consulting electrical engineer, 39 Victoria Street, S.W.

HAVERSCROFT.—For erection of nine houses, &c., Haverscroft. Mr. Joseph Oldroyd, architect, 16 Infirmary Street, Leeds.

IRELAND.—For erection of a villa residence at Mitchelstown. Plans and specifications may be seen at the offices of Mr. J. L. Russell, auctioneer, Lower Cork Street, Mitchelstown.

IRELAND.—July 28.—For erection of a caretaker's house in connection with the sewage-disposal works, Armagh. Mr. T. G. Peel, town clerk, Tontine, Armagh.

IRELAND.—Aug. 2.—For erection of a dispensary, medical officer's residence and offices at the Workhouse, Roscommon. Mr. T. J. O'Keefe, Roscommon.

IRELAND.—Aug. 4.—For providing and fitting-up two urinals in Larne. Mr. W. G. Yonge, clerk to Urban District Council, Town Hall, Larne.

IRELAND.—Aug. 5.—For erection of a villa at Castlereagh, co. Down. Mr. J. V. Brennan, architect, Belfast Bank Chambers.

IRELAND.—Aug. 6.—For erection of fourteen labourers' cottages (including out-offices, piers and gates), and the fencing of the acre plots attached thereto; also for the fencing of fourteen plots in the Kinsale rural district. Mr. R. Evans, engineer, 53 South Mall, Cork.

IRELAND.—Aug. 12.—For erection of a Crown post office and postmaster's residence at Cahir, co. Tipperary. Plans and specification can be seen at the Post Office, Clonmel, and at the Office of Public Works, Dublin.

IRELAND.—Aug. 15.—For erection of new college, Mullingar, co. Westmeath. Mr. J. J. O'Callaghan, architect, 16 Nassau Street, Dublin.

KENSINGTON.—July 31.—For alteration and enlargement of the receiving wards of the workhouse in the Marloes Road. Mr. Ernest Flint, architect, 80 Coleman Street, E.C.

LEEDS.—July 29.—For erection of a Primitive Methodist church and schools, &c., in Harehills Avenue, Leeds. Mr. W. H. Dinsley, architect, Chorley, Lancashire.

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LONDON.—July 28.—For repairs, painting, &c., to the interior of the Central London Sick Asylum in Cleveland Road, Fitzroy Square, W. Mr. Fred. W. Bailey, clerk, Cleveland Street, W.C.

LOUGHBOROUGH.—Aug. 1.—For erection of a boiler-house and chimney, engine-house, generating house and foundations for purifiers, in connection with the erection of a carburetted water-gas plant at the Loughborough gasworks. Mr. Edward Onions, engineer, Gasworks, Loughborough.

MANCHESTER.—July 30.—For alterations to Registrar's office at Philips Park Cemetery. The City Architect, Town Hall.

MANCHESTER.—July 30.—For erection of a shed at the Albert Street police station. The City Architect, Town Hall, Manchester.

MANSFIELD WOODHOUSE.—For slating six houses on the Priory estate. Mr. G. Radford, New Inn, Mansfield Woodhouse.

MERTON.—Aug. 6.—For erection of parish offices in the Kingston Road. Mr. H. G. Quartermain, architect, Merton Park, Surrey.

NEWHAVEN.—July 30.—For general repairs and internal painting and decorating at the workhouse, Newhaven, Sussex. Mr. William Gates, clerk to the Guardians, 86 High Street, Lewes.

OAKWORTH.—For erection of three houses, Lane Ends, Oakworth. Messrs. John Judson & Hudson, architects, Oakworth, near Keighley.

PETERBOROUGH.—July 31.—For extension to the engine-house, boiler-house and battery-room at the generating station in the Albert Place Meadow, Peterborough. Mr. John C. Gill, city electrical engineer, Municipal Offices, Peterborough.

PURSTON.—For erection of three houses in Wakefield Road. Messrs. Garside & Pennington, architects, Pontefract.

ROCHDALE.—July 30.—For erection of reservoir keeper's house at Ashworth Moor, Norden, near Rochdale. Mr. James Diggle, Hind Hill Street, Heywood.

RUGBY.—July 28.—For pulling-down the wooden building used as a small-pox hospital at Barby Road pumping station, and re-erecting it on a brick foundation in a field at Lawford Heath. Mr. D. G. Macdonald, surveyor, Rugby.

ROTHERHAM.—Aug. 1.—For extensions to the generating station, situate in Rawmarsh Road, Rotherham. Mr. J. Platts, architect, High Street, Rotherham.

ROTHWELL.—July 30.—For erection of cemetery chapel, lodge and fencing at Rothwell. Messrs. Gotch & Saunders, architects, Bank Chambers, Kettering.

ST. ALBANS.—For erection of a small residence on plot No. 8 on the Beaumont Avenue estate, St. Albans. Mr. Ellis Raves, architect, Orpington Road, Winchmore Hill, N.

ST. ALBANS.—For erection of carriage-building works adjoining the Kingsbury estate, St. Albans. Mr. H. E. Hansell, architect, St. Albans.

ST. STEPHEN'S-BY-SALTASH.—Aug. 5.—For erection of additional school buildings to the school at St. Stephen's-by-Saltash, Cornwall. Mr. W. J. Carder, architect, 8 Athenæum Terrace, Plymouth.

ST. THOMAS.—July 30.—For additions to the infants' school, Union Street, St. Thomas. Mr. James Jerman, architect, 5 Bedford Circus, Exeter.

SCALBY.—For erection of the grand stand, bandstand, ladies' retiring-room, &c., for the Scalby and Newby Agricultural, Floral and Horticultural Society's show at Newby on August 15. Messrs. Thomas Flinton & John Tickle, secretaries, Scalby.

SCOTLAND.—July 31.—For extension of Glasgow Central Station hotel for the Caledonian Railway Company. Mr. James Miller, architect, 15 Blythswood Square, Glasgow.

SCOTLAND.—July 31.—For additions and alterations to the Mackie Academy, Stonehaven. Messrs. Kelly & Nicol, architects, 367 Union Street, Aberdeen.

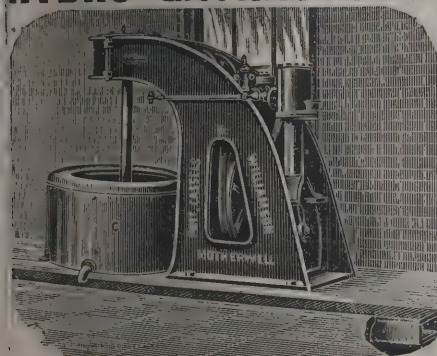
SEAFORD.—Aug. 4.—For construction of a random flint boundary wall, 400 yards long and 5 feet high, with brick piers and wooden gates, at the cemetery. Mr. E. A. Miller, surveyor, 3 Clinton Place, Seaford.

SHEFFIELD.—July 28.—For erection of a public elementary school at Greystones, Sheffield. Messrs. Hemsoll & Paterson, architects, Norfolk Row, Sheffield.

SHEFFIELD.—July 30.—For erection of urinals in Hillsborough Park. Mr. Charles F. Wilke, city surveyor, Town Hall, Sheffield.

SHERWOOD.—For erection of a detached house, private road, Sherwood. Mr. W. Dymock Pratt, architect, Long Row, Sherwood, Notts.

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**SHIPLEY.**—For erection of two semi-detached villas at Moorhead, Shipley. Mr. J. Crawshaw, architect, 1 Norman Drive, Eccleshill.

**SOUTHAMPTON.**—July 31.—For erection of a telegraph office at Southampton Docks, for the Commissioners of H.M. Works and Public Buildings. Particulars may be obtained at H.M. Office of Works, &c., Storey's Gate, S.W.

**SOUTHGATE.**—July 29.—For erection of a temporary wood and iron footbridge over the New River at Palmer's Green, and for painting and other works at the Council's yard, fire-station and cottages, Palmer's Green. Mr. Chas. G. Lawson, surveyor, Palmer's Green, N.

**SOWERBY BRIDGE.**—July 28.—For erection and alteration of the proposed offices at the gasworks, Sowerby Bridge, Yorks. Mr. R. W. Evans, clerk to the U. D. Council, Commercial Bank Chambers, Halifax.

**STALYBRIDGE.**—For erection of four shops in Market Street. Mr. Edward Garlick, architect, 121 Stamford Street, Stalybridge.

**STRENSALL.**—Aug. 2.—For erection of six houses at Strensall. Mr. Thomas Stokes, architect, Strensall.

**TADLEY.**—July 30.—For additions and alterations to Board school, Tadley, Hants. Mr. J. Gibson, architect, Basingstoke.

**TOTTENHAM.**—Aug. 5.—For erection of a fire station, dépôt buildings, &c., at Conway Road. Mr. W. H. Prescott, engineer, Coombes Croft House, 712 High Road, Tottenham.

**TRURO.**—July 31.—For alterations to the city isolation hospital. Mr. Measham Lea, city surveyor, City Surveyor's Office, Truro.

**TUNBRIDGE WELLS.**—For erection of a church at Rusthall, Tunbridge Wells. Messrs. Gordon & Gunton, architects, Finsbury House, Blomfield Street, E.C.

**WALES.**—For rebuilding of house and shop, Abercynon. Mr. J. Parry Williams, architect, Taff Chambers, Pontypridd.

**WALES.**—July 29.—For erection of six houses and shops on site of old malthouse, Caerphilly. Mr. John H. Phillips, architect, Clive Chambers, Windsor Place, Cardiff.

**WALES.**—July 30.—For extension of schools at Gilfach Goch, Llantrisant. Mr. Jacob Rees, architect, Pentre, Rhondda.

**WALES.**—July 31.—For erection of a chancel and vestry at the church of Trianglas, Trecastle, Breconshire. Mr. D. T. Isaac, Ruperra House, Brecon.

**WALES.**—July 31.—For erection of an English Congregational schoolroom at Bargoed. Rev. D. Leyshon Evans, 21 Bristol Terrace, Bargoed.

**WALES.**—July 31.—For erection of school buildings, &c., to accommodate 385 children at Bethesda. Rev. T. Griffith, Elfed Terrace, Bethesda.

**WALES.**—July 31.—For erection of a chapel at Blaenrhondda. Mr. J. Rees, architect, Pentre.

**WALES.**—Aug. 7.—For erection of a new mixed school at Aman, Aberdare. Mr. T. Roderick, architect, Clifton Street, Aberdare.

**WALES.**—Aug. 18.—For erection of a stone arched bridge, or, in the alternative, of an iron girder bridge, at the Pitt, Llanarth; and for erection of a stone retaining wall to the bridge at Hendre Glyn, Llanover, Abergavenny. Mr. John Gill, surveyor, 4 Brecon Road, Abergavenny.

**WINDSOR.**—Aug. 2.—For erection of about 750 feet of 9-inch walling at the Windsor cemetery. Mr. E. Cecil Durant, town clerk, 32 Park Street, Windsor.

**WOLVERHAMPTON.**—July 28.—For erection of covered market on the site adjoining the cold stores and ice factory in Wulfruna Street. Particulars may be obtained on application at the Borough Engineer's Temporary Office, School Street Depot.

**WORKINGTON.**—July 29.—For erection of four cottages in Harrington Road, Workington. Messrs. W. G. Scott & Co., architects, Victoria Buildings, Workington.

**LYDHAM (Salop) parish church**, which has been closed for some weeks for repairs and internal decorations, was reopened on the 13th inst. New troughing has been placed round the roof of the nave and chancel, the roof also has been repaired and the walls pointed, and inside the church the walls have been painted, the nave with a delicate shade of buff and the chancel with a ground of soft terra-cotta stencilled in a pattern of fleur-de-lis, &c. The pews have been revarnished and the inner doors of the church re covered with red baize, new seats have been fixed in the porch and the outer door has also been scraped and varnished.

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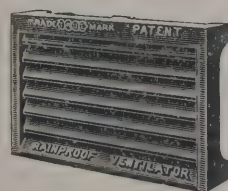
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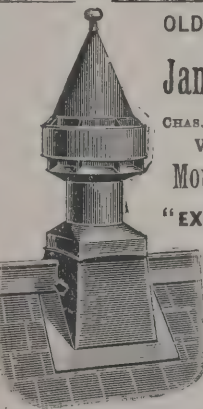
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C. Miskin & Sons	8,207 0 0
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E. Lawrance & Sons	8,096 0 0
T. Simpson & Son	8,035 0 0
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Holloway Bros.	7,960 0 0
G. Neal	7,841 0 0
L. Whitehead & Co., Ltd.	7,800 0 0
W. Tout	7,552 11 0
G. E. WALLIS & SONS, Maidstone (accepted)	7,248 0 0

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J. & W. T. Inkpen	£2,199 0 0
W. J. King	1,936 10 0
Sheffield Bros.	1,797 0 0
W. M. Dabbs & Son	1,480 0 0
A. Collins	1,175 0 0

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J. Dickson	56 0 0
Adams & Usher	39 15 0
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F. T. Chinchin & Co.	449 0 0
G. Neal	402 0 0
W. Brown & Sons	371 13 0
W. R. & A. Hide	356 0 0
BRISTOW & EATWELL (accepted)	310 0 0

For painting interior and exterior (iron buildings), Middle Row.

F. T. Chinchin & Co.	£64 15 0
W. Brown & Sons	63 10 0
W. R. & A. HIDE (accepted)	47 10 0

For painting exterior, Star Lane.

S. Polden	£139 10 0
W. Hammond	120 0 0
F. T. Chinchin & Co.	117 18 0
W. Chappell	115 0 0
BRISTOW & EATWELL (accepted)	111 0 0

For painting exterior, Moreland Street.

Rice & Son	£192 0 0
McCormick & Sons	186 0 0
Johnson & Co.	176 0 0
Stevens Bros.	170 0 0
BATE BROS. (accepted)	162 0 0

For painting interior (boys and girls'), Richard Street.

C. & W. Hunnings	£318 10 0
McCormick & Sons	286 0 0
Bate Bros.	250 0 0
G. Kirby	229 0 0
Marchant & Hirst	223 0 0
STEVENS BROS. (accepted)	218 0 0

For painting interior, Pope Street.

W. Banks	£213 19 6
G. Bush	185 0 0
E. Proctor	159 0 0
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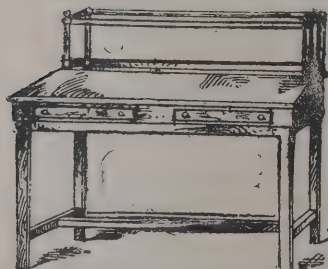
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W. Jolly	£110	6 0
E. Proctor	93	0 0
W. HAYTER & SON (accepted)	73	0 0
For painting exterior, Waller Road.		
H. Leney & Son	£186	0 0
J. & C. Bowyer	175	0 0
A. Black & Son	162	0 0
G. Kemp	160	0 0
J. F. FORD (accepted)	137	0 0
For painting interior (old and new portions), Maidstone Street.		
Viney & Stone	£593	0 0
J. Stewart	584	0 0
J. Chessum & Sons	540	0 0
G. Wales	539	0 0
T. Cruwys	498	0 0
Stevens Bros.	458	0 0
W. SILK & SON (accepted)	450	0 0
For painting interior, Mowlem Street.		
Barrett & Power	£461	0 0
Vigor & Co.	420	0 0
W. Silk & Son	377	0 0
J. Chessum & Sons	364	0 0
G. Wales	361	12 0
Collis Willmott & Son	352	5 0
CORFIELD & CO. (accepted)	310	0 0
For painting exterior, St. John's Road.		
T. Willson	£420	0 0
J. Stewart	348	10 0
G. S. S. Williams & Son	322	0 0
McCormick & Sons	285	0 0
Marchant & Hirst	261	0 0
G. WALES (accepted)	260	0 0
For painting exterior (junior mixed and pupil teachers' schools), painting interior (boys, girls and infants' schools and cookery), and painting interior and exterior (manual training and laundry centres), Tottenham Road.		
C. Dearing & Son	£951	0 0
Marchant & Hirst	507	0 0
J. Chessum & Sons	390	0 0
G. WALES (accepted)	380	0 0

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For cleaning interior, Ponton Road (infants' school and visitors' centre).		
J. R. Sims	£180	0 0
Rice & Son	39	0 0
MAXWELL BROS., LTD. (accepted)	35	10 0
For cleaning interior and painting exterior, Sleaford Street.		
General Builders, Ltd.	£897	0 0
E. P. Bulled & Co.	355	0 0
W. Read	353	0 0
E. Flood	347	0 0
E. TRIGGS (accepted)	345	0 0
For painting exterior, Waldron Road.		
J. R. Sims	£343	0 0
J. & M. Patrick	258	0 0
W. Read	248	0 0
E. Flood	195	0 0
W. H. LORDE & SON (accepted)	188	15 0
For painting interior and exterior, Fortress Road.		
Viney & Stone	£228	10 0
G. Ball	159	0 0
F. T. Chinchin & Co.	145	0 0
H. Wall & Co	143	10 0
MARCHANT & HIRST (accepted)	137	0 0
For painting exterior, Holmes Road.		
Viney & Stone	£427	0 0
G. Kirby	296	0 0
H. Wall & Co.	279	0 0
F. T. Chinchin & Co.	267	10 0
Marchant & Hirst	259	0 0
Stevens Bros.	258	0 0
MCCORMICK & SONS (accepted)	206	0 0
For cleaning interior, Drury Lane.*		
J. Appleby	£292	0 0
J. Greenwood	282	10 0
Lathey Bros.	273	0 0
T. L. Green	270	0 0
Johnson & Co.	255	0 0
W. Hornett	166	0 0
M. Pearson	141	0 0
HOLLIDAY & GREENWOOD, LTD. (accepted)	113	0 0

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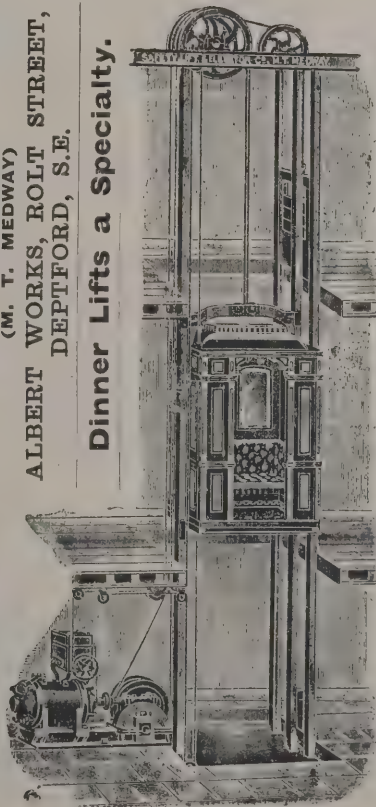
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T. L. Green . . . . .	£553	0	0
J. Smith & Sons, Ltd. . . . .	493	0	0
Marchant & Hirst . . . . .	414	0	0
M. PEARSON (accepted) . . . . .	333	0	0
Bristow & Eatwell . . . . .	306	5	0

For painting interior and exterior, Rhyl Street.

Viney & Stone . . . . .	£791	0	0
H. Wall & Co. . . . .	457	0	0
Marchant & Hirst . . . . .	437	0	0
M. Pearson . . . . .	410	0	0
F. T. CHINCHEN & Co. (accepted) . . . . .	389	0	0

For painting interior, Dalgleish Street.

A. E. Symes . . . . .	£338	0	0
A. W. Derby . . . . .	282	0	0
A. Heard & Co. . . . .	280	7	0
Vigor & Co. . . . .	270	0	0
D. Gibb & Co. . . . .	259	0	0
J. F. Holliday . . . . .	238	0	0
CORFIELD & Co. (accepted) . . . . .	228	0	0

For cleaning, painting, repairs, &amp;c., High School for Boys, Plumstead Common Road.

Hayter & Son . . . . .	£699	10	0
T. D. Leng . . . . .	610	0	0
E. Triggs . . . . .	497	0	0
E. PROCTOR (accepted) . . . . .	495	0	0

For painting interior and exterior, Deodar Road (iron buildings).

J. & M. Patrick . . . . .	£139	0	0
W. H. Lorden & Son . . . . .	134	15	0
E. Flood . . . . .	126	0	0
E. Triggs . . . . .	110	0	0
C. CURD (accepted) . . . . .	90	10	0

For painting exterior and interior, East Lane.

H. Line . . . . .	£740	0	0
J. Appleby . . . . .	690	0	0
Johnson & Co. . . . .	653	0	0
Maxwell Bros., Ltd. . . . .	554	0	0
H. J. Williams . . . . .	545	0	0
W. Sayer & Son . . . . .	532	0	0
HOLLIDAY & GREENWOOD, LTD (accepted) . . . . .	429	0	0

## LONDON SCHOOL BOARD—continued.

For painting exterior, Wood Street.

W. Hayter & Son . . . . .	£317	0	0
W. Banks . . . . .	160	12	6
W. Jolly . . . . .	135	0	0
G. KEMP (accepted) . . . . .	128	0	0

For painting interior and exterior, St. George's Row.

J. & M. Patrick . . . . .	£498	0	0
J. R. Sims . . . . .	437	0	0
W. Chappell . . . . .	340	0	0
LATHEY BROS. (accepted) . . . . .	289	0	0

For painting interior and exterior, Belvedere Place.

J. Greenwood . . . . .	£506	0	0
J. F. Ford . . . . .	494	0	0
W. Sayer & Son . . . . .	485	0	0
JOHNSON & Co. (accepted) . . . . .	472	0	0

For painting interior and exterior, Marlborough Street.

Hudson Bros. . . . .	£698	4	0
J. & M. Patrick . . . . .	671	10	0
E. Flood . . . . .	619	0	0
W. Sayer & Son . . . . .	557	10	0
E. Triggs . . . . .	539	0	0
J. Appleby . . . . .	529	0	0
H. J. Williams . . . . .	489	0	0
Johnson & Co. . . . .	470	0	0
W. HORNETT (accepted) . . . . .	460	10	0

For painting interior of old and new schools and painting exterior Higher Grade school, &amp;c., Monnow Road.

T. D. Leng . . . . .	£1,146	0	0
Johnson & Co. . . . .	979	0	0
J. & C. Bowyer . . . . .	955	0	0
H. J. Williams . . . . .	923	0	0
Maxwell Bros., Ltd. . . . .	894	0	0
W. Sayer & Son . . . . .	855	10	0
Holliday & Greenwood, Ltd. . . . .	836	0	0
E. PROCTOR (accepted) . . . . .	699	0	0

For interior cleaning, Netley Street.

Dearing & Son . . . . .	£200	0	0
W. Hornett . . . . .	181	0	0
J. R. Sims . . . . .	180	0	0
Bate Bros. . . . .	178	0	0
G. Kirby . . . . .	176	0	0
MARCHANT & HIRST (accepted) . . . . .	164	0	0

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LONDON SCHOOL BOARD—continued.

For painting exteriors, Highway (boys, girls, infants and junior mixed).  
 A. E. Symes . . . . . £325 0 0  
 D. Gibb & Co. . . . . 206 0 0  
 Corfield & Co. . . . . 191 0 0  
 J. F. Holliday . . . . . 186 0 0  
 JOHNSON & CO. (accepted) . . . . . 169 0 0

For painting interior and exterior, Millwall.  
 D. Gibb & Co. . . . . £347 0 0  
 Corfield & Co. . . . . 316 0 0  
 Vigor & Co. . . . . 315 0 0  
 J. F. HOLLIDAY (accepted) . . . . . 269 0 0

For painting interior and exterior (junior mixed and special schools), Portman Place.  
 Corfield & Co. . . . . £490 0 0  
 W. Silk & Son . . . . . 410 0 0  
 D. Gibb & Co. . . . . 337 0 0  
 Johnson & Co. . . . . 335 0 0  
 J. F. HOLLIDAY (accepted) . . . . . 208 0 0

LONDON.

For rebuilding the sessions house, Old Bailey, E.C.  
 HOLLOWAY BROS. (accepted) . . . . . £282,000 0 0

MIDDLESBROUGH.

For a new mahogany shop-front and extensive alterations to premises, 47 and 47A Linthorpe Road, Middlesbrough.  
 Mr. WALTER G. ROBERTS, architect, 61 Albert Road, Middlesbrough.  
 W. THOMPSON, Crescent Road (accepted) . . . . . £360 7 0

PLYMOUTH.

For construction and laying of about 1,670 yards of brick and concrete barrel sewers, varying from 5 feet to 2 feet 6 inches in internal diameter, and about 5,350 yards of stoneware pipe sewers from 24 inches to 12 inches in diameter, with manholes, flushing-chambers, &c.  
 J. C. LANG, Liskeard, Cornwall (accepted) . . . . . £33,695 0 7

PRESTON.

For rebuilding (in stone) of Apley (Hundred) bridge, which carries the secondary road leading from Upholland to Chorley over the river Douglas.  
 E. HAWLEY, Ridgmont, Burstwick, Hull (accepted).

RUNCORN.

For sewerage and sewage-disposal works at Helsby. Mr. W. H. RADFORD, engineer, Albion Chambers, Nottingham.  
 J. Dale . . . . . £11,657 16 0  
 R. Lomax . . . . . 11,270 19 0  
 J. Taylor . . . . . 11,000 0 0  
 J. A. Ewart . . . . . 9,443 0 0  
 J. H. Vickers . . . . . 9,120 18 0  
 Bowers Bros. . . . . 8,995 0 0  
 J. E. Dean . . . . . 8,742 1 6  
 W. Cottle . . . . . 8,657 16 0  
 H. E. BUCKLEY, Bingley (accepted) . . . . . 8,035 1 8

SCOTLAND.

For an addition to Over-Johnstone bridge over the Black Cart Water on Kilbarchan Road, near Miliken Park railway station, Greenock. Mr. R. DRUMMOND, engineer, 2 Lylesland Terrace, Paisley.  
 J. W. WOODROW, Bridge-of-Weir (accepted) . . . . . £660 6 10  
 For street works in causewaying Dixon Street and Arthur Street, Paisley.

Accepted tenders.

Dixon Street.

T. Black & Co., Paisley . . . . . £568 14 3

Arthur Street.

H. & N. Brännigan, Glasgow . . . . . 425 0 0

For erection of retort-house, coal and lime stores, at the Riverbank gasworks, Kilmarnock.  
 A. CALDERWOOD (accepted) . . . . . £3,750 0 0

STAINCROSS.

For erection of a Primitive Methodist chapel, Sunday school and outbuildings, situate at Staincross, near Barnsley. Messrs. CRAWSHAW & WILKINSON, architects, 13 Regent Street, Barnsley.

Accepted tenders.

H. Medley, mason.  
 Robinson & Son, joiner.  
 M. Fleming, slater.  
 B. S. Ledger, plumber.  
 C. Dryden, plasterer.  
 Snowden & Son, painter.

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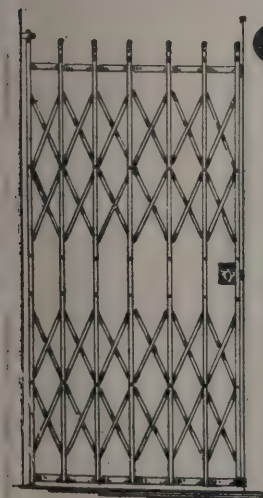
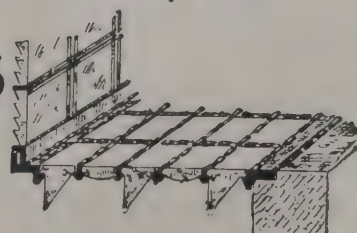
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## SOUTHWARK.

For erection of additional buildings at the rear of the town hall, Walworth Road, S.E. Mr. ARTHUR HARRISON, A.M.I.C.E., borough engineer and surveyor.

J. R. Tomkins . . . . .	£16,911	0	0
J. Marsland & Sons . . . . .	14,967	0	0
J. Smith & Sons, Ltd. . . . .	14,465	0	0
F. Lough & Co. . . . .	14,380	0	0
W. H. Lorden & Son . . . . .	14,333	0	0
J. O. Richardson . . . . .	14,250	0	0

## STEPNEY.

For alterations to the infectious mortuary at the disinfecting station, Horseferry Branch Road. Mr. M. W. JAMESON, borough engineer.

Johnson Bros. . . . .	£134	10	0
M. CALNAN & SONS, 242A Commercial Road, E. (accepted) . . . . .	81	10	0

## STOCKPORT.

For street works in Florist Street, Ladysmith Street, Lowfield Road, Gilmore Street, and passages 1 and 2 off Florist Street. Mr. JOHN ATKINSON, borough surveyor.

Gosling & Stafford . . . . .	£3,829	14	5
W. H. Eva . . . . .	3,563	5	6
W. H. Worthington . . . . .	3,419	6	8
HAYES BROS., Old Road, Stockport (accepted) . . . . .	3,291	15	3

## SURBITON.

For storm-water drainage for the north side of the railway. Mr. SAMUEL MATHER, surveyor.

T. Free & Sons . . . . .	£12,169	0	0
G. Rutter . . . . .	9,375	0	0
J. A. Dunmore . . . . .	9,101	0	0
C. W. Killingback & Co. . . . .	8,107	0	0
J. Dickson . . . . .	7,664	0	0
Case Sea Defence Syndicate . . . . .	7,286	18	0
E. Parry & Co. . . . .	7,175	0	0
G. Bell . . . . .	7,071	12	10
Streeters & Todhunter . . . . .	6,998	0	0
S. KAVANAGH & Co., Surbiton (accepted) . . . . .	6,890	4	7
J. & T. Binns . . . . .	6,858	0	0

## SWINDON.

For constructing a new road about 570 feet long, 10 feet wide, near the hospital, Gorsehill, Swindon.

A. J. COLBORNE, Newport Street (accepted) . . . . . £113 0 0

For painting, decorating, &c., the Primitive Methodist schools, Regent Street.

R. J. Leighfield . . . . . £89 10 0  
BUTTON, 69 Princes Street (accepted) . . . . . 81 13 0

## WALES.

For additions and alterations to offices, Charles Street, Cardiff. Messrs. VEALL & SANT, architects.

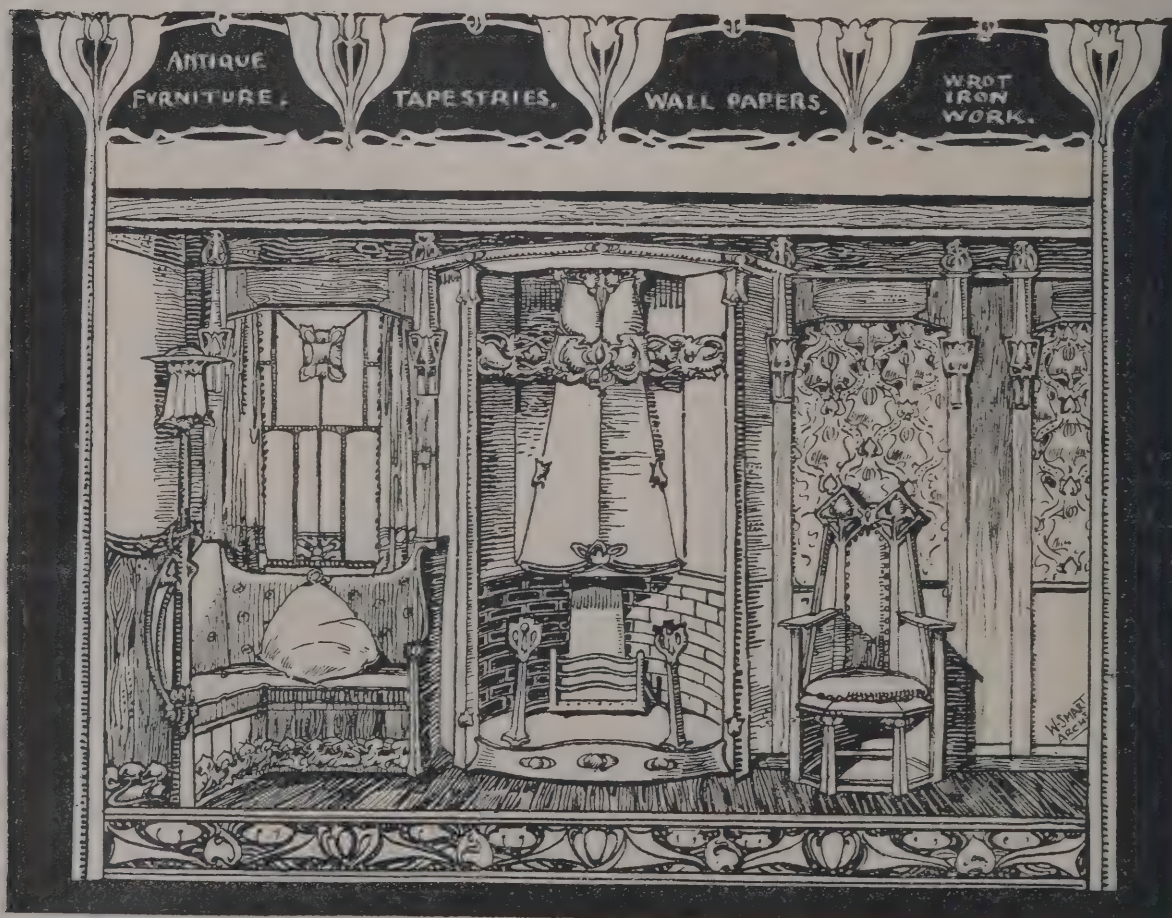
Lattey & Co., Ltd. . . . .	£1,087	17	0
W. Thomas & Co. . . . .	997	0	0
D. W. Davies . . . . .	971	0	0
Beames & Nephew . . . . .	945	0	0
Geo. Griffiths . . . . .	945	0	0
James Allan & Son . . . . .	912	0	0
F. Small . . . . .	898	0	0
Knox & Wells . . . . .	883	0	0
Shepton & Son . . . . .	875	0	0
Joseph Thomas . . . . .	866	0	0
Melhuish Bros. . . . .	850	0	0
W. SYMONDS & Co., Cardiff (accepted) . . . . .	845	2	6

For erection of an isolation hospital at Rhiwfelen Fawr, near Llantrisant. Mr. GOMER S. MORGAN, surveyor, Pontyclun.

Lattey & Co., Ltd. . . . .	£8,675	0	0
J. Allan & Sons . . . . .	8,059	0	0
Williams & James . . . . .	7,859	0	0
Morris & Thomas . . . . .	7,611	0	0
L. Evans . . . . .	7,548	19	10
C. H. Cooksley . . . . .	7,250	0	0
D. W. DAVIES, Roath (accepted) . . . . .	6,463	13	10

For construction of about 450 yards of 9-inch and 1,500 yards of 6-inch stoneware pipe sewers, with manholes, &c., at Trelewis, Gelligaer. Mr. JAS. P. JONES, engineer.

J. E. Evans . . . . .	£920	0	0
W. Brown . . . . .	884	14	4
J. Jones . . . . .	851	4	6
D. Jones . . . . .	828	6	4
J. F. Davies & Co. . . . .	803	11	0
W. LEWIS, Cefn Bryn, Brithdir, Cardiff (accepted) . . . . .	767	1	0



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WALES—continued.

For erection of a Welsh Presbyterian church, Barry Island. Messrs. HABERSHON, FAWCKNER & GROVES, architects, 14 Pearl Street, Cardiff.

Hall.

G. Hallett	£1,305	0	0
D. W. Davies	1,160	0	0
J. W. Davies	1,090	0	0
G. Haywood	1,076	0	0
T. J. Martyn	1,064	16	2
Rendell	1,050	0	0
J. Jenkins	1,010	16	0
S. Hopkins	928	16	0
GIBBY & CLEAKE, Barry (accepted)	795	0	0

Front wall.

G. Hallett	45	10	0
T. J. Martyn	41	2	6
J. W. Davies	40	0	0
G. Haywood	35	0	0
GIBBY & CLEAKE (accepted)	34	10	0
Rendell	33	0	0
D. W. Davies	32	19	6
S. Hopkins	30	8	6
J. Jenkins	22	3	0

Back boundary.

J. Jenkins	86	5	0
G. Haywood	86	0	0
G. Hallett	83	5	0
D. W. Davies	80	0	0
T. J. Martyn	79	4	11
Rendell	73	14	0
S. Hopkins	69	2	0
GIBBY & CLEAKE (accepted)	65	10	0
J. W. Davies	55	0	0

WINCHESTER.

For additions to the high school for girls, North Walls. Mr. THOMAS STOPHER, architect, 57 High Street, Winchester.  
Coston & Co . . . . . £1,137 0 0  
Fielder & Sons . . . . . 1,110 0 0  
Jenkins & Son . . . . . 1,086 0 0  
W. SHEARMAN & SON, Winchester (accepted) 985 0 0

WOLVERHAMPTON.

For formation of a new street to run from Green Lane to Raby Street.  
J. Owens . . . . . £584 19 0  
A. Cooper . . . . . 585 9 3  
W. H. Reading . . . . . 534 19 0  
H. HOLLOWAY, Bilston Road, Wolverhampton (accepted) . . . . . 519 18 1

Received too late for Classification.

BUTLER'S CROSS.

For erection of the Ellesborough parish hall. Messrs. BARRETT & DRIVER, architects, 53 Blomfield Road, Maida Vale.  
Webster & Cannon . . . . . £1,060 0 0  
G. Darlington . . . . . 918 0 0  
H. J. Wright . . . . . 859 16 0  
G. Parsons . . . . . 795 0 0  
W. Morton . . . . . 685 0 0  
SENIOR & CLARKE, Wendover (accepted) . . . . . 660 16 6

MAIDENHEAD.

For erection of a riverside villa on the Fishery Estate. Messrs. PALGRAVE & Co, architects, Westminster.  
BELCHER & Co., LTD., London (accepted) . . £1,600 0 0

PORT GLASGOW.

For erection of new refuse-destructor Messrs. STEWART, TOUGH & ALEXANDER, architects, Greenock.  
Accepted tenders.  
P. M'Bride & Co, mason, plasterer and tiler.  
Wm. Allan & Cowan, carpenter and joiner.  
C. Robertson & Sons, slater.  
Wm. Wilson & Son, plumber and gasfitter.  
Pennycook Glazing Co., roof-glazing.  
Total contracts, £3,215.

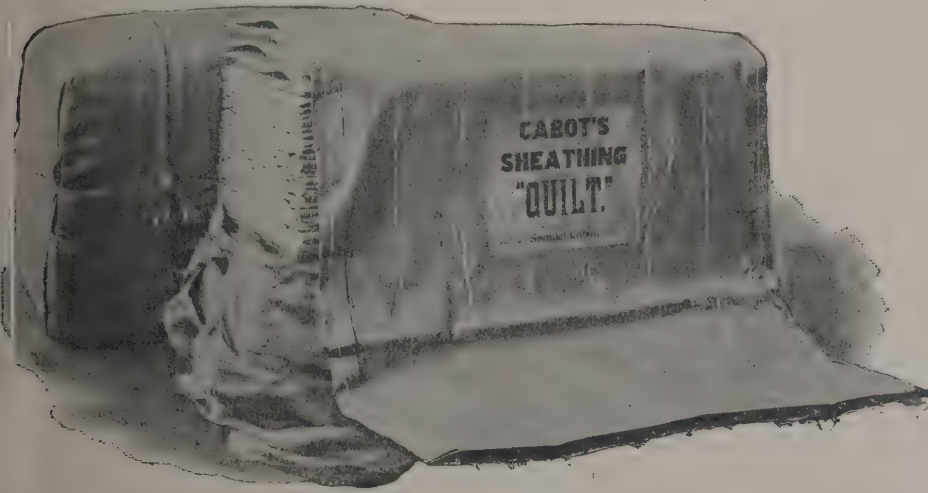
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Double Ply..	1 : 16 : 6	1 : 0 : 0
Asbestos ...	2 : 16 : 6	1 : 10 : 0

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**ELECTRICAL PROGRESS IN MANCHESTER.**

LAST week several members of the electricity committee of the Manchester Corporation, under the guidance of Mr. Councillor Bowes and Mr. Councillor Hesketh, paid a visit of inspection to several of the sub-stations and some of the work at present in progress in connection with the street mains. After going through the offices, stores, testing-rooms and sub-station which are comprised in the important buildings at the Polygon, Ardwick, the party went on to sub-stations at Bennett Street and at Levenshulme, and afterwards to the sub-station at Heaton Norris, where the progress of the work was seen to be of a promising character. In deciding upon the position of a boundary wall at this place the committee exhibited a laudable desire to preserve as far as may be possible the trees in front of the building. In making note of the advance in the work of the committee it may be said that up to the end of March the cable stores and other requirements at the Polygon had amounted to 29,362*l.* There had been expended on the mains at the same date the following sums:—Manchester, 522,123*l.*; Withington, 42,220*l.*; Moss Side, 22,680*l.*; Levenshulme, 6,302*l.*; and Denton, 2,730*l.* On the 14th of the present month the total length of mains laid was only a few hundred yards short of 261 miles. It is worthy of note, too, that the quantity of electricity measured and accounted for during the past year amounted to 11,518,940 units, and that the number of consumers at present is 4,084. In order to distribute the electric energy generated at the Stuart Street works, distributing sub-stations have been arranged for in various parts of the city and surrounding districts. There will be 20 sub-stations in all, and plots of land have been purchased for this purpose amounting in the aggregate to about 25,000 square yards. These will distribute energy for the whole of the tramway services within the city area (with the exception of that portion which is within the half-mile radius of Bloom Street) as well as in the districts of Failsworth, Droylsden, Audenshaw, Gorton, Denton, Levenshulme, Heaton Norris, Moss Side and Withington. They will also distribute energy for lighting and power in the districts named, with the exception of Failsworth and Gorton, the local authorities of which have not so far transferred their lighting orders to the Corporation. For the purpose of conveying the energy from Stuart Street to the sub-stations, about 108 miles of high-pressure three-phase mains will be required, of which some 98 miles have already been laid and the remainder are now

being laid. In addition to the high-pressure feeders, considerable lengths of low-pressure traction feeders, lighting feeders and distributors are necessary. When the various sub-stations are at work supplying all the districts referred to there will be approximately 280 miles of actual mains in the ground. The total approximate cost of buildings and machinery at distributing stations and of subways for carrying mains from the Stuart Street generating station will be about 250,000*l.*

**TRADE NOTES.**

MESSRS. ARCHIBALD D. DAWNEY & SONS, LTD., engineers, of London and Cardiff, have appointed Mr. Hilliard Stephens, of 39 Victoria Street, Westminster, S.W., as their agent for the metropolitan district.

MESSRS. SWANN & HUNTER, shipbuilders, of Wallsend, are giving a clock to be fixed at the junction of four roads at Wallsend-on-Tyne. There will be a finger-post giving the name of each road, and the clock will have four illuminated dials lighted by electricity. Messrs. Wm. Potts & Sons, clock manufacturers, Newcastle-on-Tyne and Leeds, have the work well in hand.

**ELECTRIC NOTES.**

THE balance-sheet of the Coventry electric-light department for the past year shows a working profit of 2,351*l.*, as against 1,538*l.* in the previous year, but when capital charges have been covered there remains a net charge on the rates of 1,807*l.*, as against 2,250*l.* in the previous year.

CHANGES in the electricity department of the Ashton-under-Lyne Corporation, which will be the means of conferring advantages upon consumers, have been sanctioned by the Town Council. Two new engines of 250 horse-power have been installed, which will enable the department to save both in coal and water when a light load is on the system. The price of the current to private users is to be reduced from 4½*d.* to 4*d.* per unit, with an alternative contract, the terms of which require the payment of 1*s.* per quarter per 8 candle-power lamp, and 1½*d.* per unit on current consumed. The cost of the current for motive power is to be reduced from 3*d.* to 1½*d.* per unit, with special terms for users of power on a large scale.

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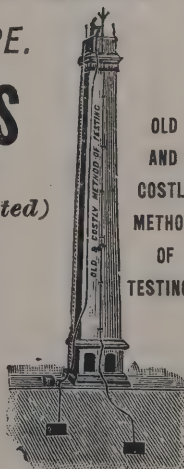
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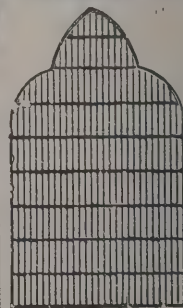
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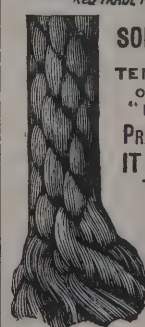
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MR. A. D. PRICE, C.E., engineering inspector, Local Government Board, held an inquiry at the town hall, Bray, Ireland, last week respecting an application for sanction to a loan of 7,000*l.* for the purpose of enlarging and rendering more efficient the electric lighting of Bray township. Mr. J. E. M'Cormick, U.D.C., chairman of the electric-lighting committee, gave evidence as to the necessity for the work in order to improve the lighting and to make the undertaking pay. The committee estimated that the revenue derivable from the electric lighting would probably be increased 50 per cent. by carrying out the proposed extensions and improvements, while practically the same staff would do the work. The commissioners had been unable to supply light to some intending consumers, and under their provisional order they were liable for this failure, and any applicant to whom they could not supply light could proceed against them. Mr. P. M'Donnell, town clerk, gave evidence as to the financial condition of the township. He stated that the valuation was annually increasing, and that the proposed loan would entail about 4*d.* in the pound additional rate, assuming that the work would be entirely unproductive; but it was calculated that the commissioners would be able to earn from 8*co.* to 1,000*l.* a year more than at present, besides having vastly improved works. The total rate in the township at present was 8*s.* 4*d.* Other evidence having been adduced, the inquiry closed with a vote of thanks to the inspector.

### BUILDING AND BUILDERS.

SKETCH-PLANS have been adopted for district baths in Leeds Road, Wakefield Road and Drummond Road, Bradford. Each, it is estimated, will cost 7,000*l.*

ON the 19th inst. Professor Mackie, of Leith, laid the foundation-stone of the church of St. Serf, Goldenacre, which is being erected along the Ferry Road, Edinburgh, and adjoining the present iron structure belonging to the congregation. Accommodation is to be provided in the new church for 800 in the area and for about 120 in the gallery. The cost, when completed, will be over 10,000*l.*

ON Tuesday the Bishop of Lichfield consecrated the new St. Peter's schools, Wolverhampton. These schools, which are situate near to St. Peter's Church institute, will take the place of the schools in St. Peter's Walk, which are about to be demolished to enlarge the wholesale market. They will

accommodate 850 children and cost 6,000*l.* The architect is Mr. F. T. Beck and the builders are Messrs. H. Willcock & Co., Wolverhampton.

THE parish of St. Martin's, Potternewton, is to have a new parochial hall and institute. The present somewhat ugly school building opposite the church, off Chapeltown Road, is to be demolished, and the new hall is to occupy the same site. It will include a suite of classrooms, as well as a large hall. Plans for the new building were invited in a limited competition, and, as a result, the design of Mr. Percy Robinson, architect, of Albion Street, Leeds, has been selected.

ON Tuesday afternoon the foundation-stone was laid of a new fire station which is to be built on a plot of long vacant land in the Blackstock Road, Finsbury Park, which was acquired for the comparatively small sum of 2,000*l.* The new building will be what is known as a full-station, which means that the equipment will include a steam fire-engine, a horsed escape, the latest appliances, stables, an officer in charge, and ten men. The cost of the building, &c., which will be carried out by the Works Department, is set down at 11,620*l.*

AT a recent meeting of the Ayr Town Council final consideration was given to the question of providing a refuse-destructor for the burgh. Estimates were submitted by Mr. Young, the town surveyor, through the medium of a sub-cleansing committee minute, showing that the site chosen was that in Mill Street, on the banks of the Ayr, adjacent to the electricity works. The estimated cost is:—Site, 3,005*l.* 1*s.* 2*d.*; buildings, 4,090*l.*; machinery and plant, 5,643*l.*; total, 12,738*l.* 1*s.* 2*d.* The site has been chosen partly with a view to the utilisation of the steam generated by the heat from the burning of the refuse at the electricity works, and the charge for this to the electricity department has in the meantime been fixed at 45*o.* per annum. The minute was adopted.

THE Wesleyan chapel committee has met for the last time before the opening of the Wesleyan Conference, and sanctioned a further outlay of between 70,000*l.* and 80,000*l.* The list contains 12 new chapels, estimated to cost 56,000*l.*; 11 cases of enlargements and alterations, estimated to cost 12,000*l.*; three new Sunday-schools, costing 2,500*l.*, besides ministers' houses and organs. One of the new Wesleyan churches to be built at Chelsea, London, is to cost 17,300*l.* At Rotherham a new church is to be built to seat 860 persons, at an estimated cost of 9,500*l.*; at Westbourne, Hartlepool, 9,350*l.* is to be expended on a new church to seat 850; in the Knaresborough circuit a

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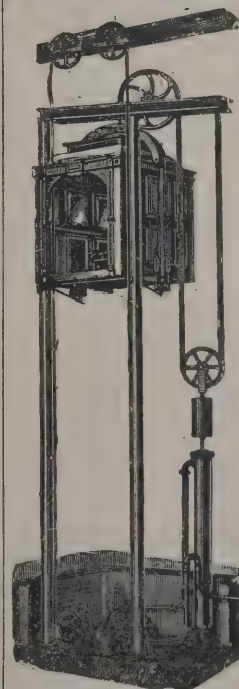
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new church is to be built at Green Hammerton to seat 100 persons, at a cost of 750*l*. Eastmoor chapel, Wakefield, is to undergo improvements at a cost of 200*l*; also Burythorpe church in the Malton circuit. At Grimsby (South Parade) 3,500*l*. is to be spent on chapel and school enlargement. At Loftus-in-Cleveland a new Sunday-school is to be built at a cost of 1,000*l*. A considerable number of the chapel debts are to be paid off with connexional grants.

THE foundation-stone was laid on the 9th inst. at Spencer's Wood, Reading, of a new Congregational church which is in course of erection. The materials used are chiefly brick, tiles and wood, and the building will consist of a nave, with narrow aisles, chancel, vestry, tower, porch, store-room and heating chamber. The interior will be finished in red brick, with cement dado, and the roof will be supported on large oak posts on hard stone bases, the roof being open timbered. The windows will be in wood, with leaded glass, and the principal light will be obtained at the ends and by dormer windows, which will also serve for good ventilation. The tower will form a picturesque structure, and provision will be made in it for access to a small gallery to be erected at the end of the church when further accommodation is required. Absence of "style" has rather been sought than anything definitely marked, the effort being to produce something very quiet, in harmony with the country. This will be promoted by large sloping buttresses externally and a broad span of roof running over nave and aisles. The seating will consist of open benches, and accommodation will be provided for 280 adults, exclusive of future gallery, which will hold 50 persons. The church will be 63 feet in length by 31 feet in breadth. The work is being carried out from the designs and under the supervision of Messrs. Ravenscroft, Son & Morris, of Reading. The contract for the building amounts to 1,451*l*.

#### VARIETIES.

A NEW church, which will be known as St. Oswald's, at Chapel Green, Bradford, was consecrated on Saturday by the Bishop of Ripon. It will accommodate 600 persons, and has cost about 15,000*l*.

THE York City Council have resolved to advertise for a town clerk in succession to Mr. W. H. Andrew, who is appointed to St. Helens. The salary is fixed at 700*l*. yearly, the duties to be those of town clerk, clerk of the peace, clerk of

the Court of Record, and secretary and solicitor to the Ouse Navigation.

A MEETING of the trustees of the Manchester infirmary was held on Tuesday. Earl Derby presided. The following resolution was proposed:—"That the plans, estimate and report of the Board of Management now submitted to the trustees for building a Royal infirmary on the present site be approved, and that it be left in the hands of the Board to commence operations and carry out the scheme as soon as they have received a substantial sum from the public towards the cost of rebuilding." It was, however, rejected by a large majority.

THE Ochil Hills Sanatorium, Kinross-shire, was formally opened on the 16th inst. The sanatorium, which has been erected for the treatment of consumption and other forms of tuberculous disease, is about a couple of miles distant from Milnathort. It occupies a plateau on the eastern spur of the Ochil Hills, and is about 800 feet above sea level. The building has cost 35,000*l*., is constructed of blue whinstone with red sandstone facings, and forms a handsome pile. It consists of a main building of four floors, and has spacious corridors 240 feet long by 10 feet wide, designed so as to secure the maximum of sunlight and ventilation. There is bedroom accommodation for 60 patients, all the rooms facing to the south. The windows are so constructed that they can be entirely opened, thus admitting abundance of fresh air day and night. The sanatorium is equipped with the most recent appliances for the treatment of consumption. Its site is said to be one of the finest in Europe for the purpose. The county of Kinross has the smallest death-rate for pulmonary consumption of any county in Great Britain. The estate belonging to the sanatorium comprises upwards of 460 acres, within which are miles of beautifully sheltered walks of various gradients rising to 1,100 feet through pine woods.

THE Incorporated Society for Promoting the Enlargement, Building and Repairing of Churches and Chapels held its usual monthly meeting on the 17th inst., the last of the present session (to be resumed in November), at the Society's House, 7 Dean's Yard, Westminster Abbey, S.W., the Rev. Canon C. F. Norman in the chair. There were also present the Right Hon. J. G. Talbot, M.P., the Rev. A. G. Ingram, the Hon. E. P. Thesiger, C.B., Messrs. E. Lee-Warner, J. C. Powell, Lewis Wigram and the Rev. W. B. L. Hopkins, secretary. Grants of money were made in aid of the following objects, viz.:—Building new churches at Dalton-in-Furness (St. Margaret),

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Lancashire, 100*l.*; Haslemere (St. Christopher), Surrey, 120*l.*; Muswell Hill (St. Andrew), Middlesex, 300*l.*; Southampton (St. Barnabas), 75*l.*; and Stoughton (Emmanuel), near Guildford, 60*l.* in lieu of a former grant of 50*l.*; rebuilding the church of St. Andrew, Stoke Damerel, Devonport, 100*l.* for the first portion; and towards enlarging or otherwise improving the accommodation in the churches at Compton Martin (St. Michael), near Bristol, 30*l.* in lieu of a former grant of 20*l.*; and Ratcliff (St. James), Middlesex, 40*l.* in lieu of a former grant of 25*l.* Grants were also made from the special mission buildings fund towards building mission churches at Five Ways (St. John the Evangelist), near Cannock, Staffs, 50*l.*; Plumstead (St. Alban), Kent, 50*l.*; Primrose Hill (St. Matthew), near Rashcliffe, Huddersfield, 50*l.*; and Twerton Hill, near Bath, 25*l.* The following grants were also paid for works completed:—Weston-super-Mare (All Saints), 240*l.*; Blackham (All Saints), near Withyham, Tunbridge Wells, 40*l.*; Stourton Caundle parish church, near Sherborne, Dorset, 25*l.*; Princetown (St. Michael), Devon, 60*l.*; and Addiscombe (St. Martin), Croydon, 50*l.* on account of a grant of 80*l.* In addition to this the sum of 220*l.* was paid towards the repairs of eleven churches from trust funds held by the Society. The Society likewise accepted the trust of a sum of money as a repair fund for the church of St. Mary and All Saints, Palfrey, near Walsall, Staffs.

THAT enterprising company the Belle Steamers, in anticipation of the wants of holiday makers, have, while maintaining their regular sailings, arranged a splendid programme for the August Bank Holiday period. Some of the special features are an express steamer to Southwold and Yarmouth at 8.45 on Saturday, August 2, and an express steamer to Clacton, Walton, Felixstowe and Harwich at 9 A.M. on Saturday, August 2, Sunday, Bank Holiday and Tuesday. Passengers travelling by this boat to Felixstowe and Harwich can return the same day, which they are unable to do at ordinary times. To avoid overcrowding on the Saturday preceding August Bank Holiday they have withdrawn the Nore steamer and utilised her for one of the other trips, and passengers will appreciate the extra comfort thereby insured. The Nore steamer will run, however, as usual on Sunday, Bank Holiday, and August 5, 6 and 7, calling at Southend on August 4 and 5. In addition to the above the steamers are running on Friday, August 1, and passengers able to leave town that day would do well to avail themselves of the opportunity. It is pleasing to note that the company do not raise

their fares on special occasions, and passengers are advised to book beforehand at the head office, 33 Walbrook, or at the booking-offices on Fresh Wharf, which are open from 8 A.M. to 9 P.M. Further particulars and special handbills giving the above information in detail can be had from the head office, 33 Walbrook, E.C.

### ARTISANS' DWELLINGS IN BRIGHTON.

A STATEMENT has been prepared showing the cost of thirty small houses erected by the Brighton Corporation on the Dews Road site. The outlay was as follows:—

Amount of contract, including extra works, 6,058*l.*; pavements, roadways, &c., 317*l.* 5*s.* 10*d.*; cost of sewers, 155*l.* 3*s.* 10*d.*; laying in branch drains, &c., 32*l.* 5*s.* 6*d.*; sundry expenses, advertisements, printing, &c., 20*l.* 16*s.* 3*d.*; total cost, 6,583*l.* 11*s.* 5*d.* This was equal to 219*l.* 9*s.* per house. Assuming the money was borrowed for forty years, an annual sum would be required for interest and redemption (at 4*l.* 15*s.* per cent., the rate at which the last issue of stock was borrowed) of 10*l.* 8*s.* 6*d.*; house let at 6*s.* 1*d.* per week would yield per annum 15*l.* 16*s.* 4*d.*, less one-third for outgoings, 5*l.* 5*s.* 5*d.*; total, 10*l.* 10*s.* 11*d.* It would be seen that the total cost per house is 219*l.* 9*s.*, and that if the houses were let at 6*s.* 1*d.* per week they would, after allowing one-third for outgoings, produce a little more than sufficient to pay the interest and instalment for redemption of debts on the money borrowed. Several members of the Council expressed the opinion that an allowance of one-third for outgoings was not sufficient, and asked for a statement of the charges actually paid in respect of outgoings in the case of the St Helen's Road houses. The committee submitted a statement of receipts and expenditure in respect of the thirty houses in St. Helen's Road, which has been prepared by the borough accountant, showing that the outgoings did not amount to one-third of the rents, but it must be borne in mind that the houses were new, and that consequently during the past year the cost of repairs was exceedingly low, amounting only to 8*s.* 4½*d.* per house. Having regard to the recent increase in local rates (which were now 5½*d.* in the £ more than they were at the same date last year), and to the increase of 2*d.* in the £ in the amount of King's taxes paid last year, the committee were of opinion that the houses could not safely be let at a less rent than 6*s.* 6*d.* per week if it was intended that they should not involve a demand on the rates.

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The committee therefore recommended that the rents of the houses be fixed at 6s. 6d. per week.

### LIABILITY FOR PAVING FOOTWAYS.

A SUMMONS was heard at the Lambeth Police Court, which was taken out by the Camberwell Borough Council against Mr. Frederick End, to recover the sum of 26l. 17s., being the proportion apportioned upon him, as an adjoining owner, of the estimated cost of paving the footways of Half Moon Lane. The point at issue was whether the Council were entitled to deal with Half Moon Lane as a new street within the meaning of section 105 of the Metropolis Local Management Act, 1855, and to charge the expense of paving the path upon the adjoining owners. It was admitted that the lane was an ancient highway, but the contention of the Council was that by reason of the extensive building operations which had taken place during the last few years it had now acquired the character of a new street, and could be dealt with as such. That contention was contested by the defence, and numerous authorities were quoted on both sides. Mr Hopkins, in giving his judgment, said that up till about as late as the year 1873 or 1874, and probably as late as the year 1880, this road might have been very well described as a thoroughly good old suburban London road, with nice houses on each side of it—twelve or thirteen in the whole length, perhaps—with good gardens, with drives and lodges, and generally with houses of a nice character. Now, the whole of the estates had been cut up, and roads had been run through the gardens and grounds and houses had been built, and the whole neighbourhood had altered its character. He found as a fact that the lane had become a new street within the meaning of the statute, and his judgment, therefore, was for the Council for the amount claimed from the defendant.

### MOTOR CARS AND MUNICIPAL WORKS.

At the annual meeting of the Municipal and County Engineers in Bristol, Mr. E. Manville read a paper on motor vehicles for borough and county work. He said:—That there are great possibilities for the self-propelled vehicle in connection with borough and county work few will deny, but it is doubtful whether the full extent of the numerous purposes to which it can be put is fully realised at the present moment, for, unfortunately,

but few really serious attempts have so far been made to utilise the new form of locomotion in this direction; and the author therefore trusts that the few following remarks he has to make on this subject may serve as a basis for reflection in the minds of municipal and county engineers as to the possible application of motor vehicles towards facilitating their work and decreasing the costs that are at present being incurred by the employment of horse propulsion. Up to the present some of the more enlightened local authorities have organised services for street watering and dust-collection by means of motor vehicles, and, moreover, some attempt has been made in one or two cities to employ the motor in connection with fire-brigade work. The scope of the automobile is so far-reaching that these experiments are comparatively insignificant, and give but the slightest idea as to the greatest results eventually to be secured. The design and construction of the self-propelled vehicle have to-day reached a standard of excellence which renders it eminently suited to all classes of work; and serious consideration should be given to the claims put forward on its behalf. The main questions are economy and reliability of running, and, perfected as it now is, the motor vehicle embodies both qualities to a very marked degree. Motor carriages can be employed by municipal and county bodies in many different ways. What better means of conveyance could be adopted by city engineers, county surveyors, chiefs of police or fire-brigades, or other civic officials whose duties so often require prompt attendance at some distant spot? A couple of minutes after a hasty summons a motor carriage could be got away, and running rapidly and smoothly through the traffic, convey the fire-brigade chief to some fierce outburst or the chief of police to the scene of a disturbance. No waiting for preparations, but an instant departure, and a journey made at a speed as fast as it is untiring. That some chiefs of fire-brigades realise the ability of the motor vehicle received corroboration only a few weeks ago, when many of the illustrated papers reproduced pictures showing Mr. Croker, the head of the New York brigade, seated in his car. Successful tests in this direction were also made with the Daimler carriage in one of the Midland towns a little time since. City engineers and county surveyors should also gladly welcome a light, fast and reliable vehicle, as by its means their duties could be much more expeditiously performed, and they would be always assured of quick arrival at any given spot when urgent need arises. Motor water and dust carts are already in use, but



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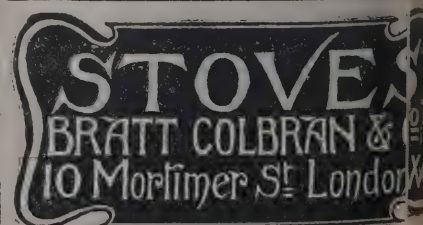
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only to a limited extent; yet they perform their duties so admirably that considerable expansion in this direction may be safely anticipated, and with it the appearance of self-propelled street scavengers and other machines of special design for the public service.

The President said his experience of motoring was not very satisfactory.

Mr. Mawbey said nothing did him more good than a ride of 10, 20 or 40 miles in a motor car, but it was false economy, he pointed out, to go in for a vehicle at a less cost than 40%.

Mr. Hooley said he, had been able to do in 36 hours what it had formerly taken him a week to do under the old order of things, and at a quarter less cost. He did not think that the motor car could be advantageously used for heavy hauling work, and he advocated the hiring of cars for borough work rather than purchasing a vehicle outright.

Mr. Weaver favoured the use of motor cars in municipal work.

Mr. Winter said in his borough (Hampstead) motor cars had been most advantageously used for street watering and cleansing, one car doing the work of four horses.

The President, in closing the discussion, said it had been shown, he thought, that there was a future for a heavy motor in towns, but the cost must be considerably reduced first.

### NEW BATHS AND GYMNASIUM, DUNFERMLINE.

DUNFERMLINE was *en fête* on the 16th inst., the occasion being the laying by Mrs. Carnegie of the foundation-stone of the new and important public buildings which, when finished, Mr. Carnegie will present to his native town.

The bath buildings occupy a site on the east side of Pilmuir Street, along which they will extend 260 feet. As previously described in the *Dunfermline Press*, the main front of the buildings is composed of a centre block of two storeys, flanked respectively on the right and left by buildings each of single storey, and on the extreme left the elevation is extended in a separate composition of simple design, forming a group of Turkish baths in two storeys. The centre block contains the entrance hall and a spacious vestibule, on either side of which is the ticket-office and a ladies' room, with costume and shoe store.

Facing the entrance are the main entrances to the pond hall on the left and the gymnasium on the right. Both of these are behind the main building.

The pond hall is a handsomely-equipped and well-lighted apartment, 92 feet 6 inches by 58 feet 6 inches, containing swimming pond, 75 feet by 35 feet, also two commodious spray-rooms and an instructor's room. On each of the two sides of the apartment there are upwards of fifty dressing-boxes, and by an ingenious arrangement of hinging the box divisions are made to fall aside; and the side floors being staged, the space can be seated for an audience, on gala occasions, of about 350 persons, in addition to 400 more provided for in the gallery which is carried round three sides of the hall.

The gymnasium is a lofty and well-lighted apartment, 103 feet by 45 feet, with a gallery on three sides. Provision is made in it for the introduction of all the latest appliances for gymnastic exercises for both sexes. On one side of the gymnasium are separate dressing and spray-rooms for the sexes, with an additional apartment on the basement floor, to be used as auxiliary accommodation on special occasions if required.

The entrance and exit for these apartments are so arranged as to secure perfect privacy to each of the sexes in passing to and from the gymnasium.

In the front building to the left of the centre block is the section comprising the slipper baths. It is arranged for fourteen plunge and nine spray baths, each with a separate dressing-box, the whole being grouped in a lofty well-lighted apartment, but with separating passages for the attendant controlling the baths under use. Special appliances for ventilation and radiators for heating are provided throughout. The Turkish baths immediately adjoin. They comprise the usual succession of hot, shampooing and cooling apartments, Russian vapour baths and plunge pond, all being of liberal dimensions and fully equipped.

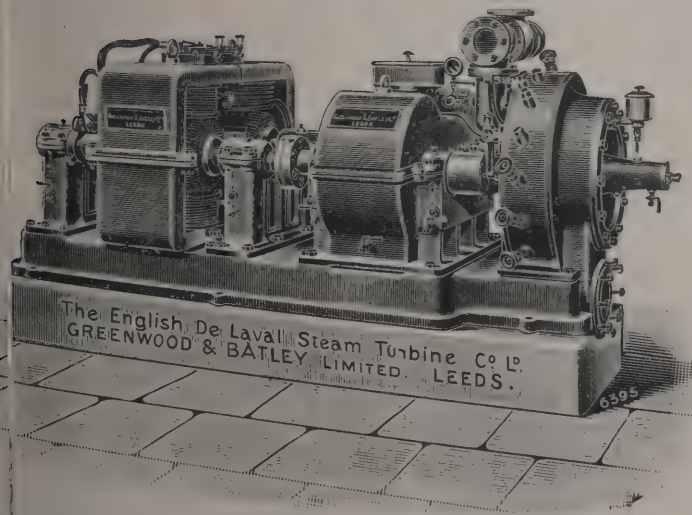
To the right of the centre block is a large handsome billiard hall, accommodating three full-sized tables, together with oriel and ingle neuk recesses for table games. The hall is furnished with separate lavatory, which is approached immediately from the main entrance, so that those engaging in the game may not be required to pass the turnstiles placed for ticket-holders to the baths.

Committee and reading-rooms are provided above the entrance hall in the centre block, and over the gymnasium dressing-room is a commodious residence for the caretaker.

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who, by private pass doors, has through communication to all parts of the building.

Under the Turkish bath block are engine and boiler-house for heating and hot-water supply throughout, and for the generation of electricity for lighting. There are also wash-house and laundry, with special drying closet, and an engineer-fitter's workshop.

A special "Sturtevant" heater for Turkish baths is, likewise, accommodated on this floor.

In maturing the plans, the most modern baths in various parts of the country have been visited, and useful information gathered and applied, so as in every way to make the result worthy the generous donor, and up to the full requirements of the town.

The buildings are designed in a simple phase of Renaissance, and promise to result in a simple, dignified and appropriate composition, the whole being faithful to the arrangements of the plan.

The stone used will be from Swallowdrum, a well-known local quarry.

Internally, the finishings will be of a tasteful, appropriate and durable quality, tinted enamelled tile and brickwork being judiciously disposed where plaster would be unsuitable.

It is expected that the total cost will be about 35,000*l*.

The architect is Mr. Hippolyte J. Blanc, R.S.A., 25 Rutland Square, Edinburgh.

### BUILDER'S ASSIGNMENT.

IN the Court of Appeal on Monday, in the case of Hughes *v.* the Pump House Hotel Company, Ltd., the defendant company appealed from an order of Mr. Justice Channell in chambers, confirming an order of Master Chitty and substituting Lloyds Bank, Ltd., as plaintiffs in the action. It appeared that the defendant company own the hotel known as the Pump House Hotel at Llandrindrod Wells, Radnor, South Wales, and that they entered into a contract with the plaintiff, Mr. Ralph Merton Hughes, of Birmingham, in 1899, to build on to the hotel a new pump-room and bar at a cost of over 6,000*l*., and to make other structural alterations and repairs to the premises, the contract for the whole of the work being for 9,338*l*. On March 7, 1901, the plaintiff assigned to Lloyds Bank, Ltd., the right to receive and, if necessary, to sue for all moneys then due or to become due under the contract from the defendants to him, and empowering the bank to give full receipts for moneys they received from the hotel company on his behalf. At the time this action was commenced the plaintiff, Hughes, alleged that the hotel company still owed him 2,788*l*. The company, having received notice of the assignment, objected to pay the plaintiff, on the ground, among others, that such payment would not prevent the bank suing them for the money under the power to obtain payment conferred on them by the assignment. The action having been brought by Hughes, the hotel company applied to Mr. Justice Wright in chambers to stay the action unless Lloyds Bank were added as plaintiffs. That learned judge held that the plaintiff could, in spite of the assignment to the bank, still maintain the action. In his opinion the assignment was not, as the defendants contended, an absolute assignment, but amounted only to a continuing security to Lloyds Bank for money advanced by them to the plaintiff. On the matter coming before the Court of Appeal, however, that decision was reversed, their lordships being of opinion that the assignment was absolute and that therefore Hughes could not bring the action. Thereupon an application was made to Master Chitty in chambers under the rules of procedure which gave the Court power where a bona-fide mistake has been made, to add or substitute a person as plaintiff, to substitute Lloyds Bank for Hughes. This the Master did, and Mr. Justice Channell confirmed his order; hence the present application for leave to appeal.

Their lordships refused leave to appeal. In their opinion a bona-fide mistake was made, and therefore Mr. Justice Channell and the Master had jurisdiction to substitute Lloyds Bank for Hughes as plaintiffs.

The application was dismissed with costs.

### LONDON SCHOOL BOARD BUILDINGS.

THE annual report of the works committee of the School Board for London has been issued. It appears that during the year ended March last the Board agreed to purchase interests in thirty-eight sites at a cost of 105,959*l*., the surveyor's fees being 606*l*. The value of all the sites, including these amounts, purchased or agreed to be purchased by the London School Board up to the end of the year under review is set down at 3,749,488*l*., and the costs in connection with them have amounted to 521,565*l*. According to a table prepared by the

finance department, the average cost of the sites for 445 schools was 7*l*. 3*s*. 8*d*. per child. The total number of permanent schools erected and opened up to Lady Day, 1901 (exclusive of transferred schools, which have been improved but not enlarged, and which are also considered as permanent) was 450. During the past year thirteen additional schools and ten enlargements of existing schools were opened, providing a total accommodation for 16,200 children. A pupil-teachers' school, which had been erected on the Offord Road site, Barnsbury, to accommodate 312 students, was also opened. The divisions in which these schools were required are the centres where the growth of the population of the School Board class demanded the accommodation supplied. They are:—Chelsea, Finsbury, Greenwich, Hackney, West and East Lambeth, Marylebone, Southwark, Tower Hamlets and Westminster. The total amount of the loans which the Board of Education authorised the School Board to incur on account of the above thirteen new schools and sites, and also the pupil-teachers' school, excluding three cases where the loans for the sites have not yet been sanctioned, and one case where the loan for the buildings had not yet been applied for, was 441,003*l*., and on account of the ten enlargements 108,304*l* for the buildings only. The average cost per head of the buildings and furniture of 445 schools, the accounts for which had been completed at September 29 last, was:—School buildings (exclusive of sites), 14*l*. 1*s*. 1*d*.; furniture and fittings (such portion as is charged to capital account), 11*s*. Tenders have been accepted during the year for erecting eight new schools, providing additional accommodation for 7,112 children and a pupil-teachers' school for 312 students; also for erecting nine enlargements of schools, including the building of a new senior mixed school, providing additional accommodation for 2,452 children. Tenders have also been accepted for carrying out a variety of other works, including a cookery centre, six laundry centres, two housewifery centres, two domestic economy schools, eight manual training centres, six schools for special instruction and rooms for teaching the upper standards in connection with eight higher-grade schools; and the total amount of the tenders accepted for carrying out drainage and sanitary works at seventeen existing schools is 39,727*l*. At Lady Day last the amount of school accommodation in course of provision was as follows:—Twelve schools were in course of erection, providing 10,634 school places; ten enlargements were in progress, providing 2,657 places; thirty-six additional sites for new schools had been or were being purchased, the schools to be erected on twenty-five of which will provide for 20,168 children; nine sites for new schools had been scheduled, the schools on seven of which will provide 5,450 places; thirty-two enlargements had been sanctioned, providing for 9,964 children; and the Board of Education had in seven districts sanctioned the provision of sites, the schools to be erected on three of which would provide for 1,750 children.

The report, among other detailed information, states that the playgrounds of 257 schools are now open on Saturdays, and of forty-six schools on Sunday, for the use of the children.

### SELLY OAK WORKHOUSE.

THE foundation-stone has been laid of new buildings which, when fully carried out, will double the accommodation at Selly Oak workhouse. Towards the end of last year it became evident to the Guardians of King's Norton Union, as well as to the Local Government Board, that the accommodation in the house was not sufficient to cope with the rapidly increasing population and the corresponding increase in the number of paupers. The house committee, especially their chairman, Mr. Joseph Walter, went into the matter very carefully, and decided that the most economical and satisfactory scheme would be one which provided for the probable requirements of the next thirty years. In formulating their plan of operations they were handicapped by the fact that the existing buildings had not been laid out with a view to future requirements, and the block which ought to be extended came too near the road. Already the original entrance was closed, and it was decided to make a new entrance at the extreme left of the workhouse and to build a new block on the waste ground further to the left. This is to be utilised as the female wards, and eventually all the old wards will be devoted to male occupants, so that the sexes will be divided by the new carriage drive. That part of the scheme which is now being carried out comprises five buildings:—(1) A new entrance lodge, containing a porter's room, a waiting-room for paupers' friends, and receiving room for males and females, with bath-room and other sanitary arrangements; (2) the first of three pavilions, 230 feet long and three storeys high, with windows on both sides, to accommodate 1,000 inmates; (3) a large store for paupers' clothes, with disinfecting apparatus, and offices for the master and clerk; (4) matron's office and sewing-room; (5) wood-chopping shed and timber store. Mr. W. Harvey-Gibbs contracted to erect the buildings for 18,700*l*. It is estimated that the engineering



work, fittings, architects' fees and incidental expenses will make up the total cost to 25,000%. The architects are Messrs. C. Whitwell & Son, of Birmingham, and the clerk of the works is Mr. George Tallis. Operations were commenced before Christmas, and the stores and matron's office are already built, and the walls of other buildings have reached a considerable height.

### MASONIC HALL, RIPON.

THE foundation-stone of a new Masonic hall was laid at Ripon on the 11th inst. The new building, which has been designed by Mr. T. Wall, architect, will face south, the frontage being to Water Skellgate. It will be a two-storey brick building, faced with machine-made pressed bricks from the Littlethorpe Brick and Tile Company. The main entrance will be in stonework of a free Classical design, in the form of two pilasters with Ionic caps, supporting a projecting stone door-head, under which will be carved a Masonic device. On entering the premises there will be a staircase hall, 16 feet 6 inches long and 9 feet 6 inches wide, this being divided from the vestibule by a glazed screen. The hall will be well lighted and fitted up with lavatory and cloak accommodation, and it will have a mosaic tiled floor. The first floor will be gained by a pitch-pine staircase, 4 feet wide and of easy ascent. Entered directly from the landing will be the ante-room, 20 feet by 11 feet, this being provided with a small private door from the tyler's lobby, the latter effectually shutting off the landing from the lodge-room. This room will be 33 feet long by 21 feet wide and 19 feet high, and will have a domed ceiling rising from an enriched moulded cornice. A natural system of ventilation will be provided by means of fresh-air inlets and Boyle's air-pump ventilator on the roof, with proper regulating valves. The floor will be in maple secret nailed, and at the east end of the room will be a raised dais, having as background a high dado with circular cornice, and covered with anaglypta of simple but appropriate design. Adjoining the lodge-room will be the tyler's store-room, 11 feet long by 4 feet wide, which will be well lighted so as to enable it to be used as a dressing-room for visiting brethren. There will be another room, 17 feet by 15 feet, entered from the landing, which will most probably be used as a library or reception-room. On the ground floor there will be a dining-room, 22 feet by 21 feet. This will be entered from

the vestibule through a lounge. Attached to the dining-room will be a service-room and kitchen, the latter having a separate entrance into the road, enabling this portion to be entirely shut off from the remainder of the premises, without in any way stopping work in that department. Between the dining-room and the hall will be a smoke-room, 16 feet by 11 feet, having cross ventilation. The whole of the woodwork throughout, except the lodge-room, will be in pitch pine and varnished. The lodge-room will be in deal, finished all through in white enamel. The surplus space on the ground floor will be devoted to the construction of a good lock-up shop, 25 feet by 16 feet, having windows into High and Water Skellgates, with a good corner entrance and spacious store cellar.

### WESLEYAN CHURCH, BOLTON.

A NEW Wesleyan church is being built in Chorley Old Road, Bolton, the aim in the design for which has been to secure a building thoroughly adapted to the needs of the congregation, and suitable to the form of service usual in the Wesleyan Church, which requires that the bulk of the congregation should be immediately round the speaker, and all should be able both to see and hear without any difficulties of intervening pillars. To realise these aims an approximation of the Greek cross style of plan has been adopted, that is, with four practically equal arms for the pewed space, an arm being lengthened by entrances and vestibules. This plan has also the additional advantage of massing the congregation together instead of dividing it into three, as is the case with the usual transeptal arrangement. As the width of the four arms inside is 38 feet, and pillars were felt to be undesirable, the roofing needed serious consideration. The style was in a measure restricted by that of the adjoining school, and a barrel vault was the natural form of ceiling. But barrel vaults simply intersecting at the crossing are bald and uninteresting, and it was determined to add to the interest and importance of both interior and exterior by placing a dome at the intersection, of a flat saucer type, carried down by pendentives to the springing line of the barrel vaults. On this dome is a massive turret which will be open to the interior, giving an eye of light at the apex and preventing the gloomy appearance of a closed-in dome. Two low towers at the front, containing the gallery entrances and staircases, will also be roofed with shallow domes, echoing the note struck by the central feature.

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The choir will be in stalls on a spacious platform raised 3 feet above the floor of the church. The rostrum will be in the centre, coming forward from the choir and the organ in a recess at the back. It is believed that this arrangement will work well for the leading of the singing without making the members of the choir too conspicuous, and will be equally good whether side galleries are put in or not. The minister's vestry and choir vestry will communicate directly with the choir platform as well as by the steps from the church at either side of the rostrum. The front entrances have been carefully studied and will not be of the cramped nature so often seen. The outer doors open upon a narthex 25 feet by 6 feet, and doors from this into an inner vestibule 25 feet by 8 feet. The gallery entrances are separate from those of the ground floor, thus preventing the crowding of the two sets of people meeting in the doorways. The length of the building is 100 feet and the outside width 65 feet. The dome inside will rise to a height of 50 feet from the floor, and the top of the turret 65 feet. The accommodation, including end gallery which will be put in now, will be 650, and side galleries which could be put in later without structural alterations would bring it up to 850. The interior woodwork will be pitch pine, the aisles are to be concreted and tiled, the ceiling plastered. The outside materials are red Ruabon brick and Yorkshire stone. The windows will be of leaded glass in plain clear squares. The contract has been let to Messrs. J. H. & G. Marsden. The architects are Messrs. Potts, Son & Hennings.

### WITTON HALL, BIRMINGHAM.

WITTON HALL, the new home of the Penn Street Industrial school, Birmingham, is a substantially built, lofty, three-storey, square, red-brick house, Georgian in its appearance, with low-pitched slated roofs partially concealed by parapets carried above a moulded stone cornice, with massive lofty chimneys. The tall sill-less sash windows with thick bars and small panes common to that period give abundance of light to the interior. The old floors are of oak, and some of the walls are lined with oak panelled wainscot. An interesting feature is the old oak staircase with its moulded balustrade.

Previous to the recent alterations there were five rooms on each floor, one of which was the kitchen. A low two-storey wing with tiled roof running east and west contained the

scullery, pantries, washhouse, laundry, &c., with bedrooms over, a second wing at right angles to the first forming the third side of a quadrangle consisted of a coach-house, stable, cow-house and pig-styes.

In the alterations now completed, by removing several walls, &c., a large portion of the ground floor of the house block has been converted into a dining-hall 48 feet by 19 feet. On the floor over a dormitory of similar dimensions has been constructed accommodating twenty-six beds. The remainder of the house is now used as the superintendent's residence.

The old scullery-wing has been extended, its walls thickened and roof raised, giving space on the ground floor for a new scullery, pantries, a boys' lavatory with twenty-four basins, and a bath-house containing a bath lined with glazed white bricks, and measuring 17 feet 6 inches by 6 feet 6 inches and 3 feet deep. The upper storey has a dormitory 61 feet by 17 feet 6 inches, accommodating twenty-nine beds, and a sick-room with an independent staircase entrance for isolation; also a master's bathroom.

The stable wing has been cleared out and made to accommodate carpenters', shoe-makers' and tailors' workshops, wash-house, laundry and store-room.

A new wing has been erected on the south-east side of the house, containing the schoolroom, 38 feet by 24 feet by 16 feet high, to be used also as a gymnasium, the principal staircase, and a dormitory over the schoolroom, 38 feet by 24 feet, accommodating twenty-five beds. Each dormitory is under the control of a master, whose bedroom adjoins and has a small window for inspection.

A one-storey wing has also been added, containing the office for superintendent and committee and an officers' sitting-room.

A playground has been formed in the rear and a play-shed, 64 feet by 16 feet, which will eventually be enclosed.

The buildings are warmed by hot water on the low-pressure system, which has been supplied by Benjamin Parker, Ltd., of Birmingham. Automatic ventilators and fresh-air inlets have been arranged to give a good supply of fresh air, and the interiors and entrances are lighted by gas.

The work has been carried out by Messrs. Mills & Son, of 35 Leopold Street, in a most satisfactory manner from the plans and under the superintendence of Mr. Freeman Smith, architect, of 88 Colmore Row.

The Lord Mayor of Birmingham opened the building on Thursday, July 17, the total cost of which, including the freehold, was 6,360*l*.



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# The Architect.

## THE WEEK.

THE verdict of the jury who heard the evidence about the fatal fire in Queen Victoria Street was not expected to refer to only one cause of the deplorable results. In our remarks which appeared in the same week, while pointing out the lack of organisation on the part of the authorities, we dealt also with the character of the structure, the absence of provision for escape, and the use of the premises as a factory. The managing director said there was only 168 lbs. of an inflammable mixture kept on the premises, but Mr. WOODTHORPE, the district surveyor, in his evidence stated he watched the fire from another building, and from the appearance of the flames and smoke he concluded that inflammable material must be burning, and the next morning he was surprised to see how little the structure was damaged. He also recorded a fact which is not sufficiently dwelt on by the authorities, that there are several premises in the City having parapets which had no means of escape for employes in case of fire; indeed, there were many places which were really death-traps, and something should be done to remedy it. It was at the same time observed by him that the London County Council, under the Factory Act, had no inspectors. The only inspectors were provided by the Home Office, consequently the County Council could not move until a building had been reported to them as being a factory. From what was reported in the House of Commons it is evident that the Government inspector had some doubts on the subject, but in this instance, as in others, the letter of the law was respected rather than protection against contingent outbreaks. The action of the Home Office in the affair is not of a kind which will give encouragement to those who work in factories. We have laid stress repeatedly on the necessity for the appointment of inspectors who are architects, and who will estimate risks not merely as to their correspondence with regulations which were penned by men without practical knowledge, but in their likelihood to become dangerous to structures, and consequently to the operatives in them. The inadequacy of the means provided by the County Council has been daily discussed since the fire occurred, and we need not emphasise a fact which is palpable to all outside Spring Gardens and Southwark. There will have to be improvements, but as long as the Factory Acts are administered on red-tape lines a danger exists for which no fire-ladders are a sufficient remedy.

CLAIMS to footpaths are not upheld without undergoing a large expense, but the right to use them is now esteemed so important, county councils are expected to uphold popular claims as a duty. From the circumstances under which the use of the footpaths originated it is always extremely difficult to discover evidence which will satisfy a judge and jury. An instance of the kind has occupied Mr. Justice PHILLIMORE and a special jury at Lewes during several days. Two or three paths were claimed by the East Sussex County Council as open to foot passengers on an estate belonging to Lady MARGARET CECIL at Burwash. But the contention was more especially over two of them. The point to be decided was whether they could be treated as public highways prior to 1876. A great many old people gave evidence, but there is a widespread belief that age cannot distinctly recall events which occurred nearly forty years ago. In all such trials it is practically impossible to produce any record of the intention of an owner to allow a right-of-way. One peculiarity of the case was that "heave" gates existed at some points, and it was contended on behalf of the owner of the estate that they were not easy to manage by women, and would not have been introduced as obstacles on a public footpath. According to Mr. Justice PHILLIMORE, a highway, with certain exceptions, can only become public by dedication on the part of the owner of the soil over which it passed. The jury replied to all the questions put to them by his Lordship about the paths being public highways in the negative. A declaration to that effect was made and an injunction granted against the defendants. It is needless to say that the result will not

generally be accepted as satisfactory, but when such cases come into Court and are not settled by mutual agreement, public rights have to succumb to the laws of evidence.

LOVERS of ancient architecture in France profess to be greatly pleased by the promotion of M. SELMERSHEIM to the rank of officer in the Legion of Honour. He is a native of Langres, and after obtaining medals for his designs at various exhibitions of the Salon, he won a gold medal in 1889. He is the senior among the inspectors of the historic monuments, for he has held that office during fifteen years. Previously he served the Commission as architect for thirty years. M. SELMERSHEIM has had, therefore, an official career of forty-five years. Among the restorations he has accomplished are the church of St. John and St. Urbain at Troyes, the belfry of Beaune, Noyons and Chartres cathedrals. He was always recognised as one of the few conservative restorers. He never sought a reputation for magnificent operations, and it cannot be said that any venerable building has suffered much at his hands. It is devoutly wished in France that his promotion may be regarded not merely as a reward for faithful services, but as an indication of the intention of the French Government to encourage restorers of the type of M. SELMERSHEIM.

JEHAN GEORGES VIBERT, the French painter, who died on Sunday last, afforded an example of an artist who could not be called successful until he hit upon a particular class of work. He used both oil and water-colours with efficiency, but without gaining general admiration. Then he made subjects of cardinals, and their brilliant robes, being well painted, were never passed unobserved. He found that purchasers preferred that he should imagine weak points in the characters of the ecclesiastical princes, and with true French malice he adhered to that mode of representation. He was familiar with the stage, and although some of his pictures may be regarded more as farces or extravaganzas than as comedies, there can be no denial of the dramatic skill with which they were depicted. A couple of cardinals listening at a keyhole might not be an edifying spectacle, but it afforded amusement to Frenchmen and encouraged the painter to pursue his prosperous course. To represent the young prelates of the Roman Court bored at the recitals of a missionary friar, or a party of tilers amusing themselves by a spectacle in a French convent of a kind that was left to the imagination, might be condemned as a degrading task, but it suited M. VIBERT. It is not easy, however, to pander to the taste which enjoys such works; the public grew tired of M. VIBERT's ecclesiastics, and when he tried his hand at other themes he was looked on as a failure. There was no doubt he was endowed with talents which, rightly controlled, might have produced excellent cabinet work. But the value of his pictures cannot be better suggested than by saying they once won him a third-class medal.

THE Musée Carnavalet has been enriched by the door from the house in the Rue d'Argenteuil which was occupied by PIERRE CORNEILLE, and in which he died on October 1, 1684. It is the gift of M. SARDOU, the dramatist. It is an acceptable acquisition, for the Musée abounds in relics of old Paris, and moreover, in the mansion which has been constituted a museum, the relative merits of CORNEILLE and RACINE were constantly discussed, for there lived Madame DE SÉVIGNÉ. The Rue d'Argenteuil was completely transformed in connection with the construction of the Avenue de l'Opéra. It seems hardly credible that the street owes its name to a village to which it served as an approach. During the operations which were necessary for the Haussmannising of that part of Paris, the house numbered 18 where CORNEILLE lived was demolished. M. SARDOU in passing asked the contractor for the door, and it has been in his possession for a quarter of a century. It is believed CORNEILLE's house was at one time part of a convent, and the thickness of the wood, which bristles with nailheads, is enough to suggest that the defence against intruders was more massive than an ordinary door. In the house, the dramatist's brother THOMAS, who was also a poet, was joint occupant, but neither could be called wealthy men. PIERRE CORNEILLE was interred in the neighbouring church of Saint Roch, where there is a monument to him.



## LIVERPOOL CATHEDRAL COMPETITION.—II.

NO. 71 is a collection of very good drawings, comprising a Byzantine scheme illustrated by a plan and the elevation of the west front, which show a dome centre and two campaniles cleverly treated in a distinctly academic manner—a Gothic organ front, and a fully designed Gothic cathedral with plan on regulation lines. The west front has two cleverly conceived towers with connecting arcade across the nave, the whole effect being very strong and dignified. The entrances, an arrangement of triple porches, are in advance of the main front, and present the appearance of a screen, masking the growth of the building at the base, which mars what is otherwise a good façade. At the crossing there is a square tower terminating in a spire, and the transepts are flanked by side towers which rise through the aisle roof between two of the buttresses, thus purposely exhibiting the end buttresses, instead of getting rid of them altogether by permitting the towers to serve their rightful purpose. The style is Late Gothic, sufficiently modern in character and marked by much scholarly treatment—a very good example of quality without any overstraining after originality.

Nos. 38, 44 and 95 are all schemes based on the wide-nave principle. The first mentioned is a distinct effort at originality, both in plan and elevation. The nave is broadly divided into three parts, the two end ones being crowned by towers the full square of the nave span, each similar in external treatment, the tops being domical and each supported by transepts, the whole being somewhat in the form of a double cross, with the extremities identical in form and elevational treatment. The result is a cathedral with balanced and symmetrical side elevations which presents no external indication of its internal disposition; nothing to distinguish the sanctuary and give proper meaning to the building. The style is individual and cannot be exactly defined; but the work throughout exhibits much ability and no little originality of a thoroughly restrained character.

No. 44 has a nave span of 76 feet, which forms in continuous length baptistery, nave and choir. The western end projects a bay beyond two flanking towers, the bases of which with transept supports are indicated to be used as library and chapter-house. The aisles are double, the outer one being an ambulatory with two arches in each bay which carry the outer wall and clerestory, the aisle proper being deep-bayed recesses the full height of the nave arcade. The sacristy, narrower than the choir, is formed beneath the central lantern, and a morning chapel completes the length eastward. The arrangement of small vestries entered direct from the choir aisles is suggestive of a Catholic rather than a Protestant cathedral. The design is in the modern manner of freely-treated Gothic, the central lantern being particularly good, though it and other portions of the exterior would be much improved by the substitution of stone for the copper pinnacle terminations, which give the drawings at least a spotty appearance.

No. 95 also has a 76 feet nave span, but in this case the aisles are single. The arcade of nave is regular with even sized piers throughout, which, as only the alternate ones carry the vaulting, is scarcely a logical treatment for the intermediates. A variation of pier size and treatment such as is found at Laon would have given greater interest. A monster gallery for orchestra, &c., overshadows the west end. The nave is bayed at the choir to narrow the chancel width, and this terminates with an apse with four chapels and morning chapel. The exterior is over plain, and the entire absence of towers or other dominant features gives a Noah's Ark appearance, which even the high campanile which the author suggests should be built 200 feet in front of the western entrance with cloister connection fails to improve.

No. 53 is a very capable study in the Byzantine style, and the completeness with which minor details of arrangement have been worked out evidence much careful thought on the part of its author. In the battle of styles it is the only real challenge in the competition hurled against the Gothic. The plan shows an atrium with a campanile occupying the centre of the entrance front, to which it is connected by a narthex running the entire width of the building. The nave is domed, as is also the crossing, the latter being

much on the lines of St. Sophia. An apsidal-ended choir, transepts with semi-domes and aisles with large side chapels either side the nave complete the cathedral proper. An episcopal house, choristers' school and theological college are grouped around a square cloister court at the eastern end, and flanking the atrium are buildings for mission societies and chancery and diocesan offices. The proposed arrangements for the clergy and choir are carefully shown. Stalls for the presbytery are positioned around the semicircle of the sanctuary apse, with the Holy Table in advance immediately under the crown of the opening, where it will be plainly in view of the congregation. The choir and lectern occupy a position in the centre of the main domed area, and are placed on a circular raised dais in a manner rather suggestive of a bandstand. The idea has been possibly suggested by the somewhat similar arrangement of the choir in the Duomo at Florence. The exterior is treated very simply and in parts effectively; but the screening of the roof of the eastern apse with a high parapet wall gives this end an unfinished appearance.

No. 94, a Renaissance design illustrated by large and very cleverly executed drawings, is simply a magnified mausoleum, imposing in character but with nothing to distinguish it from the general type; and No. 15, also in the same style but much more suggestive of a cathedral, is very ordinary in its detail, and rather clumsy in the treatment of the central dome, the arrangement of circular openings being very barren.

Of the designs submitted by architects in other countries there is not much calling for special comment, excepting in the case of Mr. R. W. GIBSON (himself an Englishman), who exhibits the design he made for the cathedral of St. John the Divine, New York City. As a brilliant *tour de force* intended to rival the splendours of the finest continental Gothic, this design, illustrated by a wonderful pen drawing, is a remarkable effort, revelling in ornateness and pinnaced to profusion. If the competition is an international one, Mr. GIBSON should have an opportunity given him to show what he can do on more moderate lines.

Mr. W. H. BIDLAKE contributes the most interesting collection of photographs, &c., of executed work. These he has arranged very simply in a brown paper album bound together with red tape. The contents are chiefly photographs of St. Agatha's Church, Birmingham, and show much refined and skilful design and detail. Some minor work shown by working drawings is also very interesting and characteristic.

Messrs. AUSTIN & PALEY are represented by their St. George's Church, Stockport, and other interesting churches in Hertford and Coventry, and Mr. W. D. CARÖE by perspectives of his churches at Stoke Damerel and Exeter, and an interior of his design for lady chapel, St. Patrick's Cathedral, New York City; but for the remainder of those who have entered the competition relying upon past work and reputation to carry them through, few have considered it necessary to make any particular effort, and the exhibition receives no added interest from their contributions. Nor in any of this executed work is there shown any glimpse of a talent or other special quality which could be considered to confirm an opinion that these gentlemen can solve the problem of designing a cathedral for Liverpool with the hope of any greater success than has been attained by many whose work we have reviewed. We hope that the selection, when announced, will not be found to be overburdened by "reputation," but that this preliminary competition may really fulfil and realise the obligations which are due to those who have responded so fully to the invitation to compete, and have specially designed work fitted to the occasion, without whose contributions the *raison d'être* of the competition would be altogether lacking.

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Scotsmen connected with London are desirous of erecting a memorial to those fellow-countrymen who have fallen in the war in South Africa. Funds are being appealed for to allow of the insertion of a large stained-glass window at the end of the nave of St. Columba's Church, Belgravia. The cost of the memorial, with suitable brasses or mosaics for the names of those who have fallen, will probably approach 1,000*l*.



## PICTURESQUE WESTMINSTER.

IN no part of England is the contrast between old and new more marked than in Westminster. It is not confined to buildings. Around the city, and especially the part on which the Abbey stands, the traditions go back, if not to a mythic period, at least to one which is coeval with the dawn of Christianity. It would not be possible to verify the legend of St. PETER establishing a church near the river, but during long centuries it was accepted that the Prince of the Apostles had guided a missionary enterprise on the low and dreary lands where few people were in habitation. That Prince SÆBYRHT founded a church on the Isle of Thorns in the beginning of the seventh is more firmly rooted. At a later time, 958, an abbey was placed there by King EDGAR. In the opening years of the eleventh century the church was rebuilt by EDWARD THE CONFESSOR, and in it he was buried in 1066. To the pious king the erection of the parish church of St. Margaret can also be ascribed.

The antiquity is suggested also by the greatest of our secular institutions. It is believed that national councils existed from a remote time, and it may be assumed that as soon as royalty settled at Westminster the assemblies or parliaments were likewise held there. A statute of 1272 is the earliest record of the adoption of the word "parliament" to denote the representative assembly; but in 1215 we have in the Great Charter a promise of the king to summon various classes of Englishmen for deliberation and the voting of grants. From 1130 Lords and Commons met in different chambers. Consequently there is reasonable ground for the popular esteem of Westminster. There are venerable cities, like Winchester and York, where momentous events were transacted; but for about 1,000 years Westminster may be regarded as the part of England which is most closely connected with English history. It was the main course amidst many rivulets.

The provincial or the foreign archæologist who visits Westminster for the first time is, however, always disappointed, after wandering through streets and lanes, when he discovers so little masonry that can be called ancient. If compared with the extent of the city, Westminster Abbey and its precincts appear to be insignificant in area. The stranger will look in vain for another example of Gothic architecture. At one time the districts of St. Martin-in-the-Fields, St. Clement Danes, St. Mary-le-Strand and the Savoy were marked by Gothic churches, but all traces of them have been obliterated. The reason for the scarcity of Mediæval work can easily be accounted for by recollecting the character of the region. The Abbots of Westminster probably possessed all the ground on the west side of the Abbey which was likely to be productive. On the east and north were the royal lands of Whitehall. St. James's Park, the Green Park and Hyde Park are part of the King's demesne. There were also large gardens attached to the mansions of nobles. Charing Cross was a limit in one direction; St. Martin's and St. Giles's were, as their names denote, both in the fields, and there are several streets and lanes which also are suggestive of having been at one time country footpaths. The dates of the erection of churches give an indication of the period when certain Westminster districts were inhabited by people requiring houses. St. Paul, Covent Garden, was built in 1640; St. Anne's, Soho, in 1678; St. George, Hanover Square, in 1724. The expression "Neat Houses Gardens," for property near where the Tate Art Gallery is now situated, is expressive of an innovation in Tothill Fields. Many people who cannot be regarded as old will remember the transformation of land that was anything but picturesque into the district of Pimlico or South Belgravia.

The portfolio of drawings entitled "Picturesque Westminster," which was produced as a Coronation souvenir, under the superintendence of Alderman WALTER EMDEN, for the Westminster Council, reveals how limited is the architectural interest of the city. The seventeenth and eighteenth-century houses which stood in Wych Street and in Drury Lane have vanished. Essex Street may be considered as of the eighteenth century. The watergate at the end of Buckingham Street is possibly as old as the Banqueting Hall. Somerset House was not completed until 1786. Adelphi Terrace also belongs to the reign of

GEORGE III. The Horse Guards was erected in 1753. St. Anne's, Soho, was consecrated in 1686, and St. James's Church, 1684. The gatehouse is the oldest part of St. James's Palace.

Westminster, in a word, can be looked upon as essentially a modern city. Indeed, it has claims to be considered to be the most modern in England. Next to the Abbey and the Houses of Parliament, the portions of it that should be most prized are Great George Street and Victoria Street, with some of the adjoining and narrower ways opening out of them. No continental city, nor even New York nor Chicago, can amidst such limited boundaries point to so many offices where enterprises which alter the character of the globe are arranged. English engineers may say with reason the earth is full of their labours, for plans are prepared in Westminster offices which relate to works all over the world. It is therefore an omission of the most characteristic feature of present-day Westminster when sketches are not introduced among the plates of the streets where engineers, contractors and colonial agents congregate. The offices and buildings cannot be called picturesque, but both are typical of the new Westminster which is universally known. The fact is that in Westminster, as in most modern cities, the picturesque only exists by giving a very wide interpretation to the word. The absence of a drawing of either street becomes the more remarkable when we find a whole page assigned to the pseudo "Old Curiosity Shop," which is as presumptuous a fabrication as can be seen in Europe. If DICKENS was to be commemorated by the plates a view might well have been given in the neighbourhood of St. John's Church, where the "Doll's Dressmaker" lived, and which he clearly described. The squares of Westminster, such as Grosvenor Square, Berkeley Square, Belgrave Square, Eaton Square, are not only important features in the city, but they are interesting from their connection with English social life, and it would not be difficult to meet with materials for picturesque views in each of them.

The plates are reproductions of pencil drawings by Mr. HOWARD PENTON; they are not over-elaborately laboured, and the majority of them are very effective examples of facile sketches. The collection is an agreeable souvenir, and by accepting a copy His Majesty the KING has affirmed the value of the work. It would, however, have been an advantage if more care had been taken in the revision of the notes. When we find it stated that the existing Brompton Oratory dates from 1851, and was designed by J. J. SCOLES, the Gothic architect, it seems doubtful whether the writer was familiar with architectural history. The Victoria Embankment is said to be the best monument to the invaluable achievements of the Metropolitan Board of Works. But although the names of some ancient authors of plans are mentioned, not a word is said about Sir J. W. BAZALGETTE, without whose indomitable energy and toughness the work must have been long delayed.

The collection, however, is exactly of the kind which is best adapted to suggest the varying aspects of Westminster. Alderman EMDEN says that "the ancient and historic city of Westminster above all others in the world overflows with every phase of human interest, not only to the kingdom, but to the whole Empire." In Westminster Abbey and the Houses of Parliament we have the storehouses of two great forces which have been influential in our history. We see the religious element under several forms not only in churches like St. Clement Danes, St. Mary-le-Strand, St. Paul, Covent Garden; St. George, Hanover Square; but in the Roman Catholic Cathedral, the Oratory, the Scotch Church, where so many prophecies were once confidently interpreted. The Law Courts, which at one time were supposed to be in their right position beside the Houses of Parliament, still remain in the city of Westminster. The Banqueting Hall, if contrasted with Buckingham Palace, shows how different were the ideas of regal grandeur. Marlborough House as well as Apsley House indicate the relations between the country and victorious generals. Somerset House was originally intended to serve as a royal residence, but in 1780, before the entire building was erected, Sir JOSHUA REYNOLDS was able to welcome the Academicians and students as the occupants of a part of it, and it was their duty, he said, to endeavour that those who gaze with wonder at the structure might not be disappointed



when they visit the apartment. CHAMBERS'S work deserves to be appreciated not only for its architectural merit, but for inaugurating a more grandiose style in Westminster. The Banqueting House is only a fragment. The Horse Guards, nearly opposite to it, suggests the kind of building which was thought to be sufficient for a great purpose about the time when CHAMBERS obtained his commission. Indeed, many of the buildings in Westminster are over-

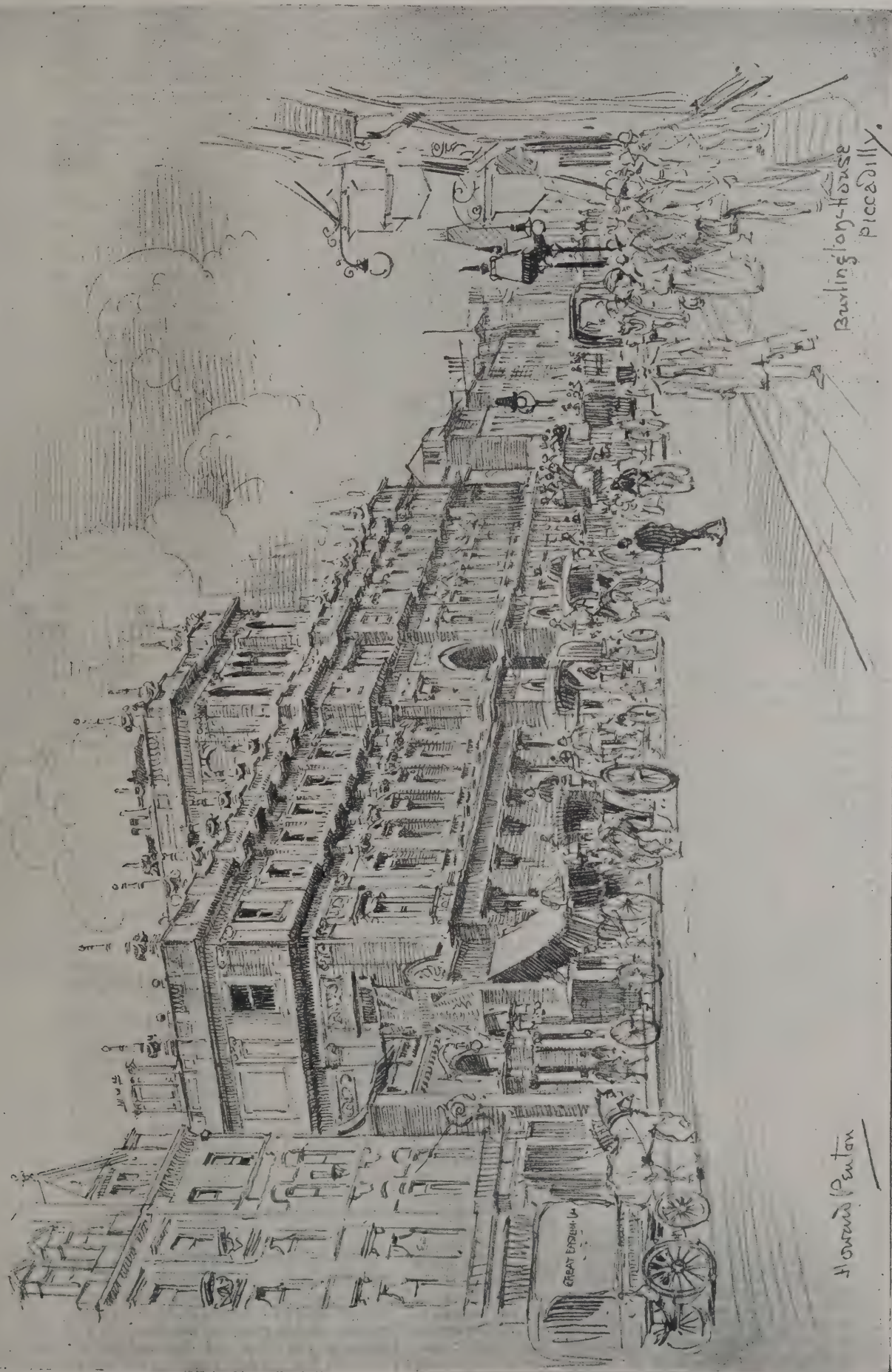
simple, as if the parish church of St. Margaret rather than the adjoining Abbey inspired the designers. The Earl of BEDFORD was only prompted by the *genus loci* when he proposed that INIGO JONES should build him a church no better than a barn. Burlington House, which shelters arts and sciences, the Charing Cross Hotel, the Town Hall, the Tate Gallery and other structures exemplify how changed is the modern taste. The people of Westminster





cannot escape the duty of raising the standard of architecture in order that it may be worthy of the historic interest which surrounds their city. We expect that in the colonies and abroad, when Alderman EMDEN's collection of sketches is seen, many will be surprised to find that streets which have a world-wide fame yet contain such a

large number of mean private buildings. The plates are an argument in favour of the necessity of extensive rebuilding, and before long we hope people will wonder how such strange structures as Victoria Station and the Royal Aquarium should be allowed to encumber prominent sites in Westminster.





## UNIVERSITY COLLEGE.

THE following prizes have been awarded in the various engineering sections:—

**Mechanical Engineering**, Professor J. D. Cormack, B.Sc.—  
**Senior Class**: Prize, W. A. Ogden, London. **Second Class**: H. E. Parker, Harrow Weald; B. C. Schroeder, Landsberg.  
**Third Class**: D. W. Ker, Sutton. **Junior Class**: Prize, E. S. Andrews, London. Certificate, 2: H. W. Allingham, London.  
**Second Class**: F. G. Helsby, Watford; P. R. Hewlett, London; Kuo Tung, Pekin; C. D. Sharp, Norwood; W. Twinch, Slough.  
**Third Class**: L. W. Atcherley, London; R. H. Cripps, Melrose; W. D. Gardom, London; C. C. A. Hardie, London; G. A. Ostler, East Finchley; T. S. Po Jui, Pekin; P. Richards, Beckenham. **Lower Junior Class**: First prize, W. A. Erlebach, London. Second prize, H. W. Allingham, London. Third prize, R. Le Rossignol, Jersey. **Second Class**: R. H. Cripps, London; K. F. Enhou, Pekin; W. D. Gardom, London; F. G. Helsby, Watford; P. R. Hewlett, London.  
**Third Class**: S. E. Garcke, London; R. E. Golden, London; A. P. Hughes, London; T. C. Linpao, Pekin; G. R. Colvin White, New Malden. **Senior Machine Design and Drawing**: First prize, W. A. Ogden, London. Second prize, B. C. Schroeder, Landsberg. Certificate, 3: D. Camacho, London. **Second Class**: V. H. Chabot, Selhurst; G. A. Grimoldby, London; H. E. Parker, Harrow Weald; F. J. White, Ealing. **Third Class**: W. H. Codner, London; L. de L. Oliva, Lisbon; H. B. Simpson, London; E. C. Taylor, Ealing; M. Toumaniantz, London; H. Wyndham, Dinton. **Junior Machine Design and Drawing**—1st Prize: W. D. Gardom, London. 2nd Prize: G. M. Clark, London. 3rd Prize: P. R. Hewlett, London. Certificates, 4: H. W. Allingham, London. 5: G. J. Hamilton, Wanstead. 6: L. W. Atcherley, London. **Second Class**: C. B. Chabot, Selhurst; C. C. A. Hardie, London; W. L. Hutchinson, Blackheath; Kuo Tung, Pekin; T. S. Po Jui, Pekin; W. Twinch, Slough. **Third Class**: L. F. Bishop, Acton; R. H. Cripps, London; F. G. Goddard, Croydon; D. W. Ker, Sutton; R. Sawers, London; M. Windsor, Banbury.

**Electrical Engineering**, Professor J. A. Fleming, M.A., D.Sc., F.R.S.—**Senior Class (Laboratory Work)**: Certificates, 1, eq. R. F. Browne, London; G. A. Hemsalech, Lodz. Prize and 3rd Certificate: B. C. Schroeder, Landsberg. 2nd Prize and 4th Certificate: F. G. Payne, London. **Junior Class and Laboratory Work**—Prize: G. M. Gibbins, Birmingham. Certificate, 2: B. A. M. Boyce, Basingstoke. **Second Class**: E. B. Cooke, London; P. E. Hart, Sutton; C. G. Peel, Porthcawl; T. S. Po Jui, Pekin; P. Richards, Beckenham; A. G. Whitfield, London; R. C. Wilkinson, Hendon; M. Windsor, Banbury. **Third Class**: C. C. A. Hardie, London; H. F. Martin, London; E. C. Taylor, Ealing.

**Civil Engineering and Surveying**, Professor L. F. Vernon-Harcourt, M.A.—**Civil Engineering**: Prize, H. Wyndham, Dinton. **Second Class**: W. A. Colegate, London; G. A. Grimoldby, London; H. E. Parker, Harrow Weald; N. E. M. Roxby, London. **Third Class**: V. H. Chabot, Selhurst; H. B. Simpson, London; F. J. White, Ealing. **Surveying**: Prize, F. G. Helsby, Watford. Certificates, 2, eq. K. F. Enhou, Pekin; W. A. Erlebach, London; C. D. Sharp, Norwood. 5: T. C. Linpao, Pekin. **Second Class**: L. W. Atcherley, London; L. W. Colman, Burgess Hill; W. G. Cooper, Finchley; R. E. Golden, London; F. J. White, Ealing. **Third Class**: C. B. Chabot, Selhurst. **Vacation Surveying Class (special certificates)**: H. R. Andoe, Guildford; J. H. P. Bradford, Martock; V. H. Chabot, Selhurst; A. C. Clifford, London; J. W. Huelin, Jersey; K. T. Lomas, London; H. H. Norsworthy, London; H. E. Parker, Harrow Weald.

**Municipal Engineering**, Professor Osbert Chadwick, C.M.G.—Certificates, 1: H. E. Parker, Harrow Weald. 2: H. Gana, Chilli. **Second Class**: J. H. P. Bradford, Martock. **Third Class**: V. H. Chabot, Selhurst; K. T. Lomas, London; N. E. M. Roxby, London.

## TESSERÆ.

## The Harmonies of Analogy in Painting.

WE know that the more pictures address the eye by numerous contrasts the more difficulty the spectator experiences in fixing his attention, especially if the colours are pure, varied and skilfully distributed upon the canvas. A result of this state of things, then, is that these colours being much more vivid than the flesh tints, the painter who wishes that his idea should be found in the expression of his figures, and who, putting this part of his art above the others, is convinced otherwise that the eyes of most people, ignorant of the art of seeing, being carried away by what they see at first, are incapable of returning from this impression to receive another—the painter who knows all these things, and is conscious of his power, will be restrained in the use of harmonies of contrast and prodigal of the harmonies of analogy. But he will not

derive advantage from these harmonies, especially if he selects a scene occupying a vast space filled with human figures, as in the *Last Judgment* of Michel Angelo, unless he avoids confusion by means of correct drawing, by a distribution of the figures in groups skilfully distributed over the canvas, so that they cover it almost equally, yet without presenting a cold symmetry. The eye of the spectator must embrace all these groups easily and seize the respective positions; lastly, in penetrating one of them he must find a diversity which will entice him to extend this examination to other groups. The painter who misses the effect of the physiognomies in having recourse to the harmonies of analogy will not have the same advantage in fixing the attention of the multitude as the painter who has employed the harmonies of contrast.

## Heraldic Devices.

As early as the twelfth century King Henry II. caused certain devices to be painted, which had a descriptive reference to his name—the *planta-genista*, or broom-sprig, and a jet passing between two broom-plants, the former of which is engraved upon the great seal of his son, Richard I., on either side of the throne. For many succeeding centuries these devices appear to have been confined to the royal use, but from the reign of Richard II. various houses of the nobility adopted their use. Thomas Mowbray, Duke of Norfolk, appeared against Henry, Duke of Hereford, in the celebrated joust at Coventry, upon a horse whose velvet trappings were embroidered with lions and mulberry trees, intended to typify his name. The devices of greatest notoriety were the white and red roses by which the contending families of the royal stem are still metaphorically described. From the close of the fifteenth to the middle of the sixteenth century the friezes, entablatures and stained windows of the more sumptuous habitations were crowded with devices. The Bourchier and Stafford knots were of this description. Camden, in his "Remains," has a section entitled "Rebus, or Name-Devices;" these were probably adopted in imitation of the emblems which, during the Neapolitan wars of the fifteenth century, were painted by the Italian chiefs upon their shields, accompanied by mottoes or quotations descriptive of enterprise, or of the general character of the bearer. Such were called *Impresses*, from the Italian word "*Impresa*."

## The Finding of the "Laocoon."

One day in 1506 it was announced in Rome that some workmen had discovered in the environs of the Seven Saloons a marble group of admirable beauty from the Greek chisel. At this news the artists and amateurs hastened to the garden of Titus, where they identified the "Laocoon," such as Pliny described it. Enthusiasm was at its height; in the evening all the church bells rang to announce the happy discovery. The poets did not sleep that night; they prepared to salute the return of the ancient *chef d'œuvre* to light with sonnets, hymns and canzonets; the next day there was a general fête in Rome. The statue, ornamented with flowers and evergreens, was paraded through the streets to the sound of music; priests formed the line through which it went, and uncovered their heads as it passed; the streets were crowded with people, and they accompanied with songs of joy the triumphal entry of the "Laocoon" to the Capitol. The statue being placed on its pedestal, Julius II. retired to his apartment, when a new fête commenced, in which the Cardinal Sadolet, his head crowned with ivy, chanted the happy event in an ode which all humanists know by heart. In the evening Sadolet found in his chamber a beautiful manuscript of Plato; it was a present from the Pope. As to Felix de Fredis, who discovered the precious statue in his vineyard, the Sovereign Pontiff gave him a portion of the revenues arising from the tax upon salt at the gate of St. John Lateran, and subsequently appointed him notary apostolic.

## Charles Christian Reisen.

The celebrated engraver of seals was son of Christian Reisen, of Drontheim, in Norway, who had followed the same profession, and who with one Stykes were the first artists of that kind who had distinguished themselves in England. The father died here, leaving a widow and a numerous family. The eldest was Charles Christian, who, though scarce twenty, had made so rapid a progress under his father's instructions, that he became the support of the family, and in a few years equalled any modern that had attempted the art of intaglia. He was born in the parish of St. Clement Danes, and on account of his extraction was recommended to Prince George, but being little versed in the language of his family, does not appear to have been particularly encouraged by his royal highness. The force of his genius, however, attracted the notice of Robert, Earl of Oxford, whose munificence and recommendation soon placed Christian (by which name he is best known) on the basis of fortune and fame. In the library and museum of that noble collector he found all the helps that a very deficient education had deprived him of; there he learned to see with Grecian and Roman eyes, and to produce heads after the antique worthy of his models; for, though greatly employed



on cutting arms and crests and such tasteless fantasies, his excellence lay in imitating the heroes and empresses of antiquity. The magic of those works, in which by the help of glasses we discover all the beauties of statuary and drawing, and even the science of anatomy, has been restricted to an age that was ignorant of microscopic glasses, a problem hitherto unresolved to satisfaction. Christian's fame spread beyond the confines of our island, and he received frequent commissions from Denmark, Germany and France. As his fortune and taste improved he made a collection himself of medals, prints, drawings and books, and was chosen director of the academy under Sir Godfrey Kneller. On the trial of Bishop Atterbury, on a question relating to the impression of a seal, he was thought the best judge, and was examined accordingly. Vertue represents him as a man of a jovial and free, and even sarcastic temper, and of much humour, an instance of which was that being illiterate, but conversing with men of various countries, he had composed a dialect so droll and diverting that it grew into a kind of use among his acquaintance, and he threatened to publish a dictionary of it. This great artist lived chiefly in the neighbourhood of Covent Garden. He died there of the gout, December 15, 1725, when he had not passed the forty-sixth year of his age, and was buried in the churchyard on the north side, next to the steps. He appointed his friend, Sir James Thornhill, one of his executors.

### Unrepresentative Character of Architecture.

Although architecture expresses in its way the aspect of natural things, one must not believe that it is a simple imitation of nature. There is never in art, properly speaking, the complex imitation of any whole whatsoever, but only parts that genius borrows from the reality, and that in employing them as irregular and imperfect materials, deprived by themselves of every æsthetic value, they unite, they harmonise, they arrange according to an ideal model which has a distant resemblance with the external objects, without reproducing them completely. The architectonical eurythmy is the copy, as it were, of a type which is not to be found out of us, not even in an imperfect manner. Architecture differs in this respect from painting, from sculpture and from poetry, and, so to speak, has music only for its companion. The architecture of the East, with its horizontal areas and its vertical lines of vast extent, its elevated ceilings, its specious cupolas suspended in the air, its pyramids, its obelisks, its minarets, its peristyles, its arches, its pylonas or pillars, its hypostyle halls and a float of sphinxes, its sanctuaries, its labyrinths, its hypogeums and its other works represent in a certain manner the terrestrial and maritime horizon, the celestial space, the immense masses and elevated peaks of mountains, the ancient forests, the majestic and woody alleys and walks, the vaults and subterranean places, the caverns and the other grandeurs of nature. But between the natural sublimities and the artificial sublimities there is a simple analogy, and not that perfect resemblance which is the end of imitation.

### James Christopher le Blon.

He was an inventor in an age which, however, has not been allotted any eminent rank in the history of arts. He was a Fleming of surprising vivacity and volubility, a universal projector, and with at least one of the qualities that attend that vocation, either a dupe or a cheat; probably the former, though as most of his projects ended in the air the sufferers believed the latter. As he was much an enthusiast, perhaps like most enthusiasts he was both one and the other. He discovered a method of giving colour to mezzotint, and perfected many large pictures, which may be allowed to be very tolerable copies of the best masters. Thus far his visions were realised. He distributed them by a kind of lottery, but the subscribers did not find their prizes much valued. Yet surely the art was worth improving, at least in a country so fond of portraits. Le Blon's method of mezzotint at least adds the resemblance of colour. He had another merit with which few inventors begin. He communicated his secret in a thin quarto in French and English, entitled "Coloritto: or the harmony of colouring in painting, reduced to mechanical practice under easy precepts and infallible rules." In the preface he says that he was executing anatomic figures for Monsieur St. André. Some heads coloured progressively, according to several gradations, bear witness to the success and beauty of his invention. In 1732 he published a treatise on Ideal Beauty, or Le Beau Idéal. It was translated from the original French of Lambert Hermanson Ten Kate. He afterwards set up a project for copying Raphael's cartoons in tapestry, and made some very fine drawings for that purpose. Houses were built and looms erected in the Mulberry Ground at Chelsea; but either the expense was precipitated too fast or contributions did not arrive fast enough; the bubble burst, several suffered and Le Blon was heard of no more. It is said he died in an hospital in Paris in 1740.

### Floors in Church Towers.

There is a part of our antiquities which seems to have escaped general observation, that is, the interiors of great or central towers to churches. This circumstance does not proceed altogether from neglect, but from such interiors being shut out from view by means of ceilings being thrown over from the four great arches usually supporting such towers. The use of the ceiling has no other end than to accommodate a set of bell-ringers, who, probably from a supposed benefit to their recreation, always choose to be as far as possible from the upper storey containing the bells. This method of hiding the ascending flights of storeys within the interior of towers appears to have been first resorted to temp. Henry VI. and VII., as many fine groined coverings or ceilings were then set up, as at Canterbury, Gloucester and Wells Cathedrals, &c. These interiors no doubt were formerly intended to have the same effect on the uplifted eyes as domes in Roman architecture, yet with this difference: the former display served by their upright and vanishing lines, their aerial perspective to lose the termination of each design in regions of geometrical refulgence; while the latter appearances revealed all their properties at one view, keeping a sort of middle way and confining by the continued line of a circle the eye to familiar forms and readily conceived construction. Take the storeys of a tower as they rise; each tier soon becomes, from the variety of perpendiculars, a continued and interesting attraction to the mind in its deepest research, affording at the same time almost incomprehensible speculation to modern architects how and which way such majestic elevations were brought to that standard of perfection we now behold.

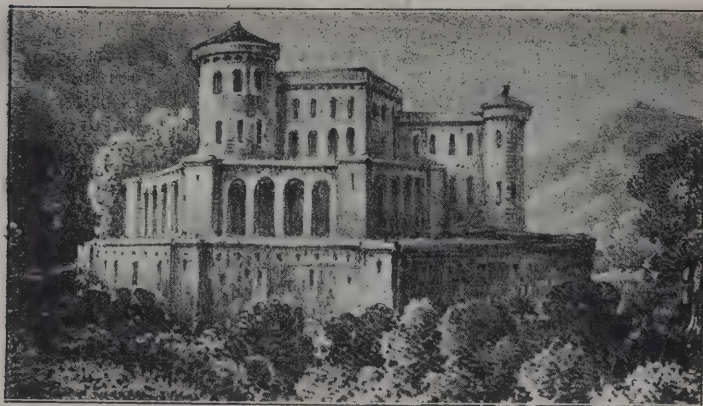
### Chinese Gateways.

The plan of constructing the gateways of Chinese cities is subject to very little variation throughout the country. This consists of a semicircular projection from the face of the wall, in the side of which, though often found in the front, there is an arched gateway leading into a small enclosure, beyond which is an inner arched gateway leading into the city. The whole of this structure, which is in keeping with the wall, is devoid of all architectural display, being formed of plain grey brickwork on the outer face and margined above with embrasures placed at regular intervals. The only breaks in the long line of straight wall—sometimes in a very ordinary city three miles in length—are these gateways, and projecting square bastions situated at intervals of about 80 yards to serve as flanking defences. The wall itself varies from 1½ to 2½ feet in thickness at the top, and is somewhat thicker near the foundation. There is a bank of earth thrown up behind this wall to serve as a banquette, &c. The masonry of the city walls is formed of the largest-sized bricks. At about 20 yards in front of the wall there is a moat, 40 yards wide, crossed by bridges in front of each gateway.

### The Academy of Bologna.

No school is more celebrated than the private academy of the Carracci at Bologna, and although Lodovico Carracci endeavoured to procure a papal brief from Clement VIII. in 1599 for the establishment of an academy on the plan of the Academy of St. Luke at Rome, it was not till 1712 that a public academy of the arts was established at Bologna. Count Francesco Ghisiglieri established an academy in which there was a living model school in 1686, under the direction of Bolognini, Malvasia, E. Taruffi and L. Pasinelli. Still it did not continue many years. Lodovico Carracci accomplished the separation of the painters from the artisans, with whom they were united in the common guild, and had he lived a few years longer he probably would have accomplished also the establishment of an academy. Clement XI. granted the brief (*Breve*) for the foundation of the Bolognese academy, whence its name Accademia Clementina. Its actual founder was the General Count Marsigli, and its first meetings were in his palace. It was dedicated to Santa Catarina Bigri; the number of academicians was limited to forty, and Carlo Cignani was its first president. The academy building was originally the Palazzo Poggi, which was purchased by the Senate in 1712 for a national institute, of which the academy of the arts is a part. It has a good collection of casts, which was presented by Benedict XIV., and a very valuable gallery of pictures, for which it is chiefly indebted to Pius VII. The present Pinacoteca, which contains them, is an addition to the old edifice, by Leandro Marconi, since the peace of 1815, by order of Pius VII. The academy of the Carracci was only a private school, and ceased at the death of Lodovico in 1619, yet it was of such popularity and extent that all other private schools in Bologna suspended their functions of necessity, as they had no pupils. The Carracci called their school L'Accademia de' Desiderosi, the academy of the desirous, chose *Contentione perfectus*, By competition perfected, for a motto; and they and their scholars termed themselves gl'Incaminati, or gl'Incaminati Accademici, which means, literally, the started, or the pioneers; in this case, to excellence.





PAINTERS' ARCHITECTURE: NICOLAS POUSSIN.

### NOTES AND COMMENTS.

It may sound remarkable that the aid of Her late Majesty Queen VICTORIA should have been implored to save the Campanile at Venice. But when we learn of the despairing efforts of Signor VENDRASCO, the architect, to preserve the structure whose ruin in his eyes was impending, there is nothing extraordinary but rather characteristic of him when having failed with Ministers he appealed to Queen MARGUERITE and to Queen VICTORIA. His letter to the latter was regarded as an offence in the official world, for communication with other States is a privilege confined to a Foreign Office. That was in 1878. Twenty years afterwards the irrepressible architect had to pay for his exhaustless enthusiasm, which annoyed the officials, by being transferred from Venice to Cagliari, and because he did not arrive at his journey's end by the appointed hour he lost his office. The want of punctuality was, of course, only an ostensible reason, his offence being his unconquerable anxiety for the security of the Campanile. We must not blame the Italian officials too severely. There are few countries where men like Signor VENDRASCO are welcome visitors to Government departments.

An important point in an arbitration has been confirmed by a judgment of Mr. Justice BINGHAM. The result, however, will mean the payment by the Manchester Corporation of 496,068*l.* instead of 229,353*l.* The case related to the purchase of the property of the Manchester Carriage and Tramways Company. Some of the company's tramways were held on lease from the Corporation, but there were other lines in the city and suburbs of which they were the owners. The whole were worked as one system. On the expiration of the lease the Corporation refused to renew it, and served notice that the company should sell the parts they owned within the city. The suburban authorities similarly served notices. The amount to be paid was left to the decision of Sir FREDERICK BRAMWELL, C.E., who was to "fix one sum as the value of all the tramways undertaking and to apportion such sum among the purchasing authorities, and to decide what property and things other than the permanent way of the tramways should be transferred to the respective purchasing authorities, apportioning the purchasing authorities' proportion of the properties." At the outset an important obstacle arose; that was whether the cost of the depôts and the plant should be apportioned in such a way as to correspond with the parts of the systems which were held on lease and the parts which the company owned. In other words, the Corporation appeared to consider that an important part of the depôts and plant should be dealt with in the same manner as the leased tramways and become their property. Sir FREDERICK BRAMWELL found as a question of fact that all the depôts and plant were suitable to and used for every part of the system. He therefore found that the company were entitled to be paid 496,068*l.* But he made an alternative award by which the amount was reduced to 229,353*l.* Mr. Justice BINGHAM decided that it would be a mistake in the circumstances of this case to

say that because the property in question was suitable to and used for the purposes of the leased lines, it therefore could not be said to be suitable to and used for the purpose of the undertaking to be acquired under the award. Judgment was accordingly given in favour of the company for the larger amount.

THE advantage of a discussion about the plans for the new Government offices when the arrangements for their execution may be taken as completed is not evident, but we suppose Parliament would fail in its purpose unless opportunities were afforded for tardy criticism. The speeches on Tuesday had, however, the effect of enabling the First Commissioner of Works to make a statement which must have caused some surprise. Mr. AKERS DOUGLAS said that in his action respecting the utilising of the late Mr. BRYDON's drawings the saving of expense was not his main object, and that he was perfectly ready to spend all the money if he thought good work could be done with it. In order to secure to the House that the plans which they had approved of should be carried out in their integrity and without any change, directly he received them from Mr. BRYDON's executors he had them stamped and countersigned by the President of the Institute of British Architects; and, if the House desired it, the plans would be deposited there and would be entirely at their disposal. Lord BALCARRES had asked him for an assurance that no variation whatever should be made in these plans. He had already given a public assurance, and he now repeated it, that no variation at all would be permitted in the external elevations, and that, where it was necessary to make slight variations in smaller matters, such as knocking two rooms into one, they should only take place when approved by the President of the Institute of British Architects and the consultative committee. This seems to have more of superstition than of reverence. Mr. BRYDON did not possess infallibility, nor could he be accepted as a divinely inspired architect. In the course of the operations he was likely to receive ideas which would improve his plans, and he would, no doubt, have asked for authority to make changes. If similar ideas were to come to those who are charged with the realisation of the plans we do not think it wise that the building should be made less convenient or less pleasing out of respect for Mr. BRYDON's memory. Under similar circumstances an ordinary client would not act like the First Commissioner of Works, and in the public interest he should have displayed more courage in departing from drawings which, in the opinion of some of Mr. BRYDON's friends, are immature performances, or, in other words, only experiments which have to be gone through in order to secure perfection.

### ILLUSTRATIONS.

DETAIL OF GATES, LLOYD'S BUILDING, FENCHURCH ST., E.C.

CATHEDRAL SERIES.—HEREFORD: SOUTH AISLE, LOOKING EAST.  
FROM SOUTH AISLE, LOOKING INTO NORTH TRANSEPT.

DRAWING-ROOM. QUEEN'S HOTEL, LEICESTER SQUARE.

CORNER OF MR. M. MENPES'S STUDIO, LOOKING TO  
DRAWING-ROOM.

THE PRINCE BLUCHER, STAFFORD STREET, WALSALL.

THE HOPE INN, LEEDS.

IN this building the specialties of the Burmantofts Company have been employed, and the building owes its character to them. Through their sanitary value the materials are of importance for similar buildings where men of all classes have to be served, for the facility with which the walls can be cleansed removes the danger of contagion, and the impermeable glazed surface is a barrier to microbes.



## PANSHANGER.\*

ACCORDING to Cussans, Panshanger derives its name from having formerly been the "hangre" or meadow belonging to Paine, a common Saxon appellation. By other writers hanger is defined as a wooded slope, and Thorne associates it with a family named Hanger, who held it during part of the reign of Henry VIII.

The ancient name of this manor was Blakemere; it was bestowed by William the Conqueror upon Geoffrey de Bech, one of his followers, and is recorded in the Domesday Survey thus:—"That the land is and was worth 15s.; in King Edward's time, 40s (1042-66), and that two of King Edward's thanes hold the land and might sell it." In 1391 I find that William de Melksope had the right of free warren of Panshanger.

No further account of the descent of this manor can be traced until the reign of Henry VIII., when it formed part of the possessions of Gertrude Courtenay, Marchioness of Exeter, upon whose attainder in 1541 it came to the Crown. The Marquis of Exeter was beheaded for high treason in 1541.

no record can be found in the register of either All Saints or St. Andrew's parishes. He represented the borough in Parliament in 1695, and history records that in 1705, when he was only forty-one, he had for many years been considered as the man who spoke best in the House of Commons. He with his brother Spencer got up a company of volunteers to aid the Prince of Orange, who had just landed in England, but the Militia at Oxford very peaceably stopped and disarmed them. In the reign of Queen Anne, 1702-14, he was made Lord Keeper of the Seal of England, and in that capacity took the principal share in the important negotiations with the Scotch for an union between the two kingdoms. He was raised to the peerage by the title of Baron Cowper of Wingham, in Kent, and appointed by the Queen on May 4, 1707, Lord High Chancellor of Great Britain. He was the first to break the disgraceful custom of receiving new year's gifts, which averaged about 3,000*l.* from the officers of the Court of Chancery. He risked Court favour once by his courtesy to Richard Cromwell in 1659, with the greatness of mind that marked his character. Ordering a chair for him when the old man attended upon a trial in Westminster Hall, for this



PANSHANGER, NORTH FRONT.

Afterwards Henry VIII., in the thirty-eighth year of his reign (1547) granted it by the name of Panshanger to Nicholas Throckmorton, in fee.

By means which are not ascertained it afterwards appears to have become the property of Sir Stephen Slaney, who was Lord Mayor of London in the thirty-seventh year of Queen Elizabeth's reign (1596).

From him it descended to his son and successor Stephen, and continued in his family until it became vested in two daughters, one of whom, Mary, the wife of a gentleman named Hitchcock, bought her sister's moiety, and had issue a daughter who married a merchant of the City of London named Elwes, by whom it was sold to William, son of William, first Earl Cowper.

This nobleman sprang from an ancient family seated at Strode in Sussex in the reign of Edward IV., 1461-83. He is said to have been born in the castle at Hertford in 1664, but

civility to the ex-Protector of the Commonwealth it was expected that Earl Cowper would have been reprimanded by the Sovereign, but he received praises and thanks, and when the Tories came into power the Queen herself tried to persuade him to retain office, but he steadily refused.

There was only one serious check in the prosperity of his life, which I take from an article by Edward Rose in the *Illustrated London News*. It was caused by the trial of his brother Spencer, who in 1699 left London and rode to Hertford, being at that time a barrister on the Home Circuit. At Hertford he usually stayed at the house of a Quaker lady named Stout, but on this occasion, taking his brother's advice, he took private lodgings. Now Mrs. Stout had an only daughter, a beautiful girl, who it appears had fallen madly in love with young Mr. Cowper. He seems to have been in no way to blame, but from his portrait at Panshanger, which we have seen to-day, we judge that he must have been a very handsome fellow, with keen, dark eyes and straight nose; and Miss Sarah Stout, although knowing that he was a married man, wrote him a series of very outspoken letters declaring her

\* A paper read by Mr. Henry Virgoe before the members of the Upper Norwood Athenæum.



passion for him. Cowper had to call on the mother to pay some money he had received for her; he stayed and dined with them, and left at four o'clock, promising to return in the evening and stay all night. He did return, and heard the maidservant told to prepare his bedroom; this she did, but he did not go upstairs, and shortly afterwards the maid heard the sharp slam of the front door, a door which the whole house heard when it did shut. The maid, surprised, went downstairs, and was more surprised to find that not only had Mr. Cowper gone out, but that Miss Stout was nowhere to be seen. She told the mother, who had gone to bed some time before. Both were greatly astonished, but it seemed quite clear that Miss Stout and Cowper had gone out together, for the door had only been heard to shut once. The night passed, neither returned, and in the morning came the terrible news that Miss Stout's dead body had been found in the Priory river near the town floating among the stakes of a mill dam. Though there was no actual evidence against him, Spencer Cowper was the last person who had been seen with her, and not only was he tried for murder, but half the kingdom believed him guilty. England was divided into "Stouts" and "Cowpers," not a Tory nor a Quaker but maintained that the young Whig barrister had first ruined and then murdered the luckless girl. The judge was weak and biased also. Cowper defended himself with perfect courage and ability, but though there was no kind of proof of murder, and it was shown that the girl was a hypochondriac, it yet seemed doubtful whether a Hertford jury might not find him guilty. Luckily, he was able to prove beyond question that he was at the Globe and Dolphin inn before the clock struck eleven. The inn was at least half an hour's walk from the mill stream, and the maidservant was certain that it was a quarter to eleven or less when she heard the door slam. Only one verdict could be returned and the young barrister was acquitted. The true story is pretty clear. Spencer Cowper had told the unhappy girl when they were left alone together that he could not see her again, and shortly after he went out she had crept to the door, shut it gently after her and gone to her death in the river. Twenty-eight years after those memorable assizes Spencer Cowper himself was raised to the bench—the only judge, it is said, who had ever stood in the dock on a charge of

is to him we are indebted to-day for permission to visit the beautiful mansion and grounds of Panshanger.

As we look at Panshanger House we see a long grey building, ivy clad, with turrets and towers, with a look of home, of pleasant ease, which is seldom found in our ancient castles. It is of what may be called "the early nineteenth-century-feudal order," and is as picturesque and pleasant as the mansion of a great English family could well be, and to those of us who to-day visit it for the first time it seems to possess a charm all its own. As we enter the hall, paved with black and white, a few steps bring us to the picture gallery, which is the great treasure-house of Panshanger, and we see the picture of the Laura of Petrarch, with Petrarch's poems by her side, by Andrea del Sarto; also one of Andrea del Sarto painted by himself, and this faultless painter is the great glory of the gallery, although there are Raphaels of the highest beauty and a Fra Bartolommeo that resembles in its glowing colour a cluster of jewels. The pictures by Vandyke, Teniers, Reynolds, Lawrence, Lely, Kneller, Correggio, Rembrandt, Guercino, Salvator Rosa, G. Poussin, N. Poussin, Perugino, Bourgonne, Carlo Dolce, Velasquez, Francia, Titian, Cuyp, Rubens, Dominico Fati, Paul Veronese, Wouvermann, Annibal Carracci and Opie form a most magnificent collection, and we shall doubtless carry away with us a great feeling of pleasure that we have been privileged to see them to-day. It is impossible in my limited paper to give a full and detailed account of them; the memory of them will undoubtedly remain with us.

The collection of china is probably unsurpassed, consisting as it does of most exquisite specimens of Dresden, Sèvres, Chelsea, Crown, Derby and Indian ornaments in such abundance that we saw scarcely a chimney-piece or dressing-table upstairs or down without being filled with the choicest productions of these various schools.

Of the interior of the house which we have been shown over to-day, I have no space to particularise, but I trust one and all have been charmed and delighted with its comfort and grandeur.

The grounds, as we have seen, are beautifully laid out—the swelling lawn, the lovely flower beds, the edges of box, the monograms of the Cowpers formed by lines of box, the clusters of dark trees and wooded hills, the broad water into



PANSHANGER.



HERTINGFORDBURY CHURCH.

murder. He never failed to show the greatest humanity to men placed as he himself had been.

The first Earl Cowper died at Cole Green on October 10, 1723, and lies buried in Hertingfordbury Church. He was succeeded by his son William, the purchaser of this manor, at whose death his son, George Nassau Clavering Cowper, succeeded to the title and estates on September 18, 1764. He died at Florence on December 22, 1789, and was succeeded by his eldest son, George Augustus Clavering Cowper, who dying unmarried on February 12, 1799, the estates devolved to his next brother, Peter Leopold Lewis Francis Cowper, fifth Earl Cowper, who in the year 1801 pulled down the family mansion at Cole Green, which had been erected by the Lord Chancellor Cowper in the beginning of the eighteenth century, and built the present handsome house in the Gothic style from the designs of Atkinson in 1801.

The present earl succeeded to the title and estates in 1856. He is connected with the three great Whig names of Hertfordshire, the Cowpers, the Melbournes and the Palmerstons, and has maintained their high place among the statesmen of the Liberal party. To his long list of titles he is also Viscount Fordwich, Baron Butler of Moor Park, Baron Cowper of Wingham, Baron Dingwall in the peerage of Scotland, Baron Lucas, and a baronet and prince of the Holy Roman Empire. He was also for some time Lord-Lieutenant of Ireland, and it

which runs the little river Mimram form a perfect picture of sylvan beauty.

The old oak tree which we saw in the pleasure grounds is remarkable for the largeness of its dimensions, and for the vigour of its growth; his top is bald—"stag-headed" is the woodman's word. Some of his spreading boughs have dipped and grown into the ground like new little trees holding their parent's hand; all the great branches near the earth are enough in their bulk and length to stand for full-grown trees themselves were they placed upright in the earth. It is the size and spread of these, its mighty arms rather than its mere height, which makes Panshanger oak a wonder of greatness. By a measurement taken in the year 1719 it was found to contain 315 cubic feet of timber. By a subsequent one made by Mr. Edward Ellis, of Hertford, on May 29, 1805, by direction of the Earl, 796 cubic feet, including those branches which were sufficiently large to be considered timber. It was again measured in June 1888, and was found to contain 1,222 cubic feet. The village we are now in I find is called by the ancient authorities Hertfordingberie, not Hertingfordbury, as now. The word signifies "a passage through the river in the meads," and is of Saxon origin.

Hertingfordbury Church, which we have just visited, was originally in the great diocese of Lincoln; it afterwards passed to the See of Rochester and was transferred to St. Albans on



the creation of that bishopric. I find in the ecclesiastical taxation made by order of Pope Nicholas IV. in the twentieth year of King Edward I., A.D. 1291, that Hertingfordbury Rectory was rated at 8*l.* per annum.

In the survey made upon the dissolution of the monasteries in the twenty-sixth year of the reign of King Henry VIII., 1535, it was valued in the king's book at 12*l.* 15*s.* 2*d.* per annum.

The church dedicated to St. Mary was completely restored during 1890 and 1893 at the sole expense of Earl Cowper. It is an ancient edifice of flint and stone, dating apparently from the early part of the fifteenth century, and consists of chancel, with a chapel on the north side, nave of four bays, north aisle, south porch and an embattled western tower with spire, containing a clock and five bells, dated respectively 1706, 1750, 1823, and the last two 1656. The inscription on one of the 1656 bells is "O praise the Lord for His goodness and declare His wondrous works," and the inscription on the other is in English, but is illegible. The chapel on the north side of the chancel is the mausoleum of the Cowper family, and contains on the west side an alto-relievo in white marble by the celebrated sculptor, Roubiliac, to Spencer Cowper, who was chief justice of Chester in 1717 and a justice of the Common Pleas from October 1727 till his death December 10, 1728. The figure is in judicial robes with attendant emblematical figures. On the north side is a monument to William, second Earl Cowper, died December 1764, with a medallion portrait. On the north wall is an inscription to George Augustus Frederick, sixth Earl Cowper, died April 15, 1856. There are other memorials of this family in the church itself and in the churchyard, where are also numerous tombs of the families of Chester, Brassey and Hastings.

In the tower against the south wall is an altar tomb supporting on a slab of black marble the recumbent figures in marble of Sir William Harrington, knighted at Royston, October 14, 1615, and his lady. The figure of the knight has been mutilated, but that of his wife remains to-day as perfect as when it was erected, and is a beautiful piece of sculpture; both are in winding sheets. At the feet is a representation of their daughter in an attitude of prayer. Above on two tablets of marble is a long and eulogistic inscription of not sufficient interest to be quoted here. On the opposite side is the effigy of Annie, wife of Sir George Calvert, knighted at Hampton Court September 29, 1617, and who died in 1622. It is in white marble and is habited in a richly-embroidered dress and wearing a ruff and long mantle. Amongst other memorials to various rectors and gentlemen of the parish there is one to Sir Frederick Gore Ouseley, Bart., Mus.Doc., and under the chancel arch is a brass of the fourteenth century with an inscription in Norman French to "Phelipe et Isabel, filles a Robert de Louthe," and another to "Robert de Louthe and Johane, sa feme. Dieu de ses aimes eut mercy." The present incumbent is the Rev. Canon Burnside, M.A.

In conclusion, I have to thank both Mr. Harradence and Mr. Downes for the great assistance they have rendered me in enabling me to prepare this paper. The time at my disposal was limited, so that I trust, under the circumstances, any shortcomings will be overlooked.

Authorities consulted:—"Chauncy's History and Antiquities of Herts," "Clutterbuck's History of the County of Herts, 1821," and "Cussans's History of Herts," and the *Illustrated London News*.

The illustrations are from photographs by Mr. Henry Virgoe and Mr. Charles Wheeler.

## THE ROYAL ARCHÆOLOGICAL SOCIETY.

TO Southampton have come "from all the four winds of heaven," as the President happily put it, members of the Royal Archæological Institute of Great Britain and Ireland for the purpose of holding their annual meeting and conference.

In welcoming the members of the Institute to Southampton, says the *Hampshire Advertiser*, the Mayor said they would find Southampton the centre of a district of great interest to them all, and he was sure all the objects of interest which would be shown to them would be fully explained. For many centuries Southampton was the port of the capital of the country, and Southampton Water was the cradle of the English navy, and the scene of naval battles from the time of the Danes to the invasion of the Dutch under Van Tromp in 1666.

Sir Henry Howorth, in proposing a vote of thanks to the Mayor, said they had gathered from various parts of the country for two purposes. The first was to improve their own knowledge by studying at first hand some of the many antiquities and objects of interest which were there in this famous county. They had come also in the hope that they might arouse some interest within the county itself in its own treasures, and give an impetus to those local scholars and

antiquaries who were trying to keep alive in this part of England an interest in the history of our ancestors as represented in the ancient monuments still left us, and to take care that they were as far as possible handed on to succeeding generations as nearly intact as possible. They felt that they were specially favoured in meeting in a county so far removed from foreign influences as Hampshire was, except as regarded that particular town, a county which preserved so much of the flavour of antiquity, and which was represented at that meeting by Lord Montagu, whose family seemed rooted in the soil of Hampshire like the great oaks which looked as if they could never be removed. He could not help saying that it was their function not merely to study antiquities in the concrete form of churches and similar remains, but also to study history in its best form, as preserved in charters and original documents; and when they came to those old towns, with their corporations dating from the early Plantagenets they must feel what England owed to these towns and those who governed them, local men who really won a very large part of the liberties of the country, and working steadily without pay, secured and conserved a great deal of that which made up the life of a happy self-governed community.

Lord Montagu, on taking the chair, referred to the interest which the King had shown in antiquarian pursuits, and said he felt sure the members would wish to express their great regret at the recent serious illness of the King, their admiration of the way in which he had borne it, and their pleasure and thankfulness at his recovery. The President said that he would convey an expression of the feeling of the meeting to the King. Proceeding, Lord Montagu spoke of the previous visit which the Institute paid in 1873 to Southampton. Continuing, he said:—We are now met within the ancient walls of Southampton, Sampton or Ampton, as it is so often colloquially called by many of the inhabitants of the neighbourhood, especially in the New Forest, thus recalling its name dating from Roman times and the Roman settlement at Clausanton, the mouth of the Anton or Itchen River, at Bitterne, as we now know it. Clausentum was of course connected by Roman roads northward with Venta or Winchester, and Calleva or Silchester, all "castras" or camps of the Roman colonisation and conquest, and no doubt with Porchester ("Portus Magnus"), that splendid castle which we hope to visit in Portsmouth Harbour, and so eastwards on to Chichester. When we see the stately beauty of what remains of the ancient walls of Southampton, mostly of the twelfth century, we feel how much we could desire to see them more free from the disfiguring buildings erected against them, in which some of their most beautiful features are actually incorporated. It is to be feared that the new line of railway along the western shore, which has received the sanction of Parliament, will spoil the view here obtained of the old Edwardian walls. Southampton, I regret to say, cannot be altogether complimented on the treatment of its ancient monuments. The beautiful Bar Gate, which at one time was threatened with destruction, is disfigured by the line of electric trams being taken through it, and the recent erection of a disagreeable building at the end of the High Street, on the site of the old Water Gate, spoils the view of the river and quays. At the same time, private munificence has rescued "King John's House," and there is a part of "Canute's Palace" still remaining and some parts of other old houses, which it is intended we should visit to-day. Such visits have undoubtedly a favourable effect on public opinion, creating interest and support for the preservation of remnants of former ages. At Winchester you will see some splendid old walls also of the twelfth century, some portions even of older date, and when we visit that most interesting and ancient city, the cradle of Christianity as well as of the Constitutional monarchy under which the British Empire has reached its present greatness, let us remember that the principles of government which were laid down by King Alfred are the foundations upon which the British Constitution have been reared. The attempt now to describe in any detail the wonderful objects of interest in the city of Winchester would be impossible. I am glad to see that two days of the session are to be devoted to them. The cathedral alone would occupy a whole day to do it justice, its history dating from the year 643, its bishopric seventeen years later. There are the remains of the castle, and the splendid hall, now called the County Hall, of which I understand Mr. William W. Portal is going to give us an account when we visit Winchester to-morrow, and no one is better qualified to tell us all about this most interesting and beautiful monument of former times. Another object of unfailing interest is the Hospital of St. Cross with its almost perfect Norman church, its two foundations of the Brethren of St. Cross in 1132 by Bishop Henry de Blois, and that of Cardinal Beaufort, the Brethren of Noble Poverty. One of the honours I esteem most is having been a trustee of St. Cross for a great many years and seen the revival of the foundation of the Brethren of Noble Poverty. I am glad to see that a visit is to be paid to the ancient College of Winchester and its lovely cloisters, as well as to the Castle of



Wolsey, of which it is to be regretted so little remains, to which we are invited by the Mayor of Winchester and the President of the Hampshire Field Club. I fear time may not permit of a visit to what remains of the Abbey of Hyde, with which the memory of King Alfred is so intimately connected. The neighbourhood is rich in monastic remains. Of some the churches still happily remain and are still used for Divine worship, such as Romsey, the Benedictine foundation dating from 907, the Collegiate Church of Christchurch, of the time of Edward the Confessor, while those of the abbeys of Beaulieu, and its fair daughter Netley, are in ruins. The visit to Romsey cannot fail to be of great interest, especially as the late discoveries of the foundations of an older church have been made, and will be explained to us. While we hope to see the remains of the Priory of Titchfield, 1231, and the house called "Place House," 1539, built upon the site, and incorporating a portion of the church, by Sir Thomas Wriothesley, first Earl of Southampton, time will, I fear, not permit a visit to the remains of the abbey of Southwick, also a priory of the Austin Canons, founded at Porchester in 1133, and removed to Southwick when Porchester became a royal castle, nor can we hope to reach the beautiful abbey church of Christchurch. I am glad to observe that a visit is proposed to the ancient and unused episcopal palace, built by Henry de Blois, at Bishop's Waltham, which was largely rebuilt by William of Wykeham. There are also other objects of interest in that neighbourhood. Some small opportunity will be given to members to have a glimpse of one of the most interesting monuments of ancient days, now unique, namely, the New Forest, the last remaining royal forest, curiously enough the last royal forest to be made, and therefore called the New Forest, and the last one remaining, all the rest of the royal forests having been disafforested. It is of great interest to archaeologists, as well as to the British public, whose enjoyment of it for recreation is dependent on its remaining open and enclosed, except such portions as are allotted to the growth of timber. This, with the free exercise of the rights of common and the preservation of the ancient and ornamental woods, are now secured by Act of Parliament. There is much still which may repay more methodical study in this beautiful area. The fosses require to be traced, and they seem to indicate a careful plan of defence by the ancient Britons, whose cremated remains are to be found in the tumuli which appear on most of the large open heaths on the high ground. I have felt that my position here to-day is only that of one who desires, like most of you, to obtain by means of this meeting of the Institute a better knowledge of the objects of interest which surround us, and for which we shall be indebted to those gentlemen who are good enough to give us the benefit of that careful research which they have been engaged in. Amongst them I must mention the Hampshire Field Club and Archaeological Society, and those excellent officers of this Society and others associated with it. To mention any in particular might seem to court criticism; the names of Mr. Shore, Mr. Minns and Mr. Dale, naturally suggest themselves to our grateful notice. The thanks of the members of the Institute, of which our valued friend, Sir Henry Howorth, is the able president, will be due to those gentlemen who have undertaken to enlighten us from the valuable store of knowledge they possess, and I hope that they will awaken a greater interest in the local as well as the general public of this great county and neighbourhood for the preservation of the priceless monuments of antiquity, and so help to preserve them for future generations.

Judge Baylis, in proposing a vote of thanks to Lord Montagu, mentioned the fact that in some of the old books reference was made to the vineyards of Hampshire.

Lord Montagu said he was pretty sure that the monks of Beaulieu Abbey used to make wine, and some fields in the vicinity were still called the "vineyards."

A resolution expressing sympathy with the city of Venice and the Italian people in the loss which had been occasioned by the fall of the Campanile, and conveying an intimation that the Society would contribute towards its erection, was carried unanimously, and the meeting terminated.

Afterwards the members visited St. Michael's Church and the Bar Gate, at which latter place the Rev. G. W. Minns, Mr. W. Dale and Mr. R. M. D. Lucas gave an account of the town walls and ancient buildings of Southampton. A tour of the town was then made to see the twelfth-century cross church (St. Michael's), the fourteenth-century vault in Simnel Street, King John's House, the West Gate and Guard House, Canute's Palace, God's House and God's House Gate.

On the second day the members of the Society assembled at the South-Western hotel, where Mr. Green delivered a lecture on "Clausentum," and Mr. Dale, Southampton, exhibited a number of interesting antiquities found in and about Southampton. The Dean of Winchester (Dr. Stephens) presided, and remarked that he esteemed it a great privilege to preside at that meeting, and thus to be among the first to welcome the members of the Society to West Saxon soil. He thought that on the eve, they trusted, of the coronation of

another King of our long line of monarchs there was a certain appropriateness in the Institute meeting in this part of the country, which might be called the cradle of England, and if of England, then of the British Empire. Wessex grew into England, England into Great Britain, Great Britain into the United Kingdom, and United Kingdom into the British Empire. If Wessex was the cradle of England, then Southampton was the cradle of Wessex. It was difficult, perhaps impossible, to determine why this place "Hampton" should have given its name to the county or shire of "Southampton." They knew that most of the other divisions, counties or shires of the West Saxon kingdoms took their names from tribal divisions or old principalities. They might have expected, perhaps, that where the West Saxons made their first settlement should have borne the name of Wessex or Winchester, the royal city, but such was not the case, and the only explanation of the county being called "Southampton" was that the West Saxons had a peculiar affection for "Hampton," the original settlement. Continuing, the Dean said he thought the Institute had done right in making Southampton their starting-point, for it was the starting-point of all the invaders into Wessex from the earliest times. He hoped their invasion would prove very profitable, and that they would carry away rich spoil, additional knowledge and pleasant reminiscences.

Mr. Green then read his paper, and at the outset said that some of the members who had been accustomed to regard Southampton as a wooden town might have been astonished to find how much history attached to the place. In the course of his remarks Mr. Green observed that Clausentum showed no sign of military character, not much even of a civilian residential occupation; it seemed to have been simply a large and well-protected commercial depôt for the export of the western produce in the way of tin and lead, whilst at Dover began the Watling Street, that great north road which seemed to speak all along its route of soldiery, fighting and trouble. At Clausentum began the Ikeneld Street, leading directly to and enclosing the rich and fine districts, the vales and forests and mines of our Gloucestershire and Somersetshire, speaking only of peace and prosperity. With their minerals, agriculture and flocks, this prosperity reigned for 400 years, yet the subject of this domestic life had hitherto passed almost unnoticed. Having enlarged upon this point, Mr. Green pictured in connection with Clausentum the first Channel Squadron guarding the narrow seas and convoying and protecting all exports from this pleasant district to the great western depôt.

Sir Henry Howorth proposed a vote of thanks to Mr. Green, and in doing so said that the first time the name of Southampton occurred was in the year 825 in a charter of King Egbert.

Mr. Dale afterwards exhibited and described an excellent collection of prehistoric implements which were found in this neighbourhood, and Mr. Hudd, of Caerleon, exhibited photos of a Celtic shrine that had been discovered in South Wales.

Votes of thanks to these gentlemen brought the meeting to a close.

The members were very busy in Winchester on the third day, and many of those who assembled in the evening to hear a paper by Mr. W. H. St. J. Hope on "English Fortresses" were in consequence very much fatigued. Fortresses he divided into three classes—those built by the Danes during the second half of the ninth century, those built by the English during the first quarter of the tenth century, and those built by the Normans.

Those "wrought" by the Danes—of which Wareham, Dorset, affords an example dating back to 876—were only temporary measures of defence. They were the originals of what we now call the blockhouse system, which have been requisitioned largely in South Africa. Directors of military operations then knew what they were about—they "fortified them with the best soldiers and plenty of pay." We might have completed our lesson from those early leaders with advantage. The Normans not only brought castles to England—they were the inventors of castles.

Winchester Castle, of which a view depicting it as it was about the end of the Elizabethan period was shown, dates back to 1057. The castle was built just outside the old Roman wall, apropos of which the lecturer explained that they were generally placed just outside, so that if the townspeople turned rusty, those guarding the castle retreated outside, while at other times the castles served the double purpose of dominating the town and controlling the passage of the waterway. Most interesting views illustrating how sites with those objects in view were selected were exhibited.

Southampton is, or was, a case in point. "I did not take you to the place" (at Southampton), said Mr. St. John Hope, "because all you would have seen is a Baptist chapel. The poor little tower they wantonly destroyed." Southampton has evidently gained notoriety of an unenviable kind amongst those learned in the history of the past. The entrenchments of the castles were originally topped with wooden defensive



work (a subsequent speaker drew the comparison of the ancient custom of the Romans, whose soldiers carried wooden rails as part of their equipment, and after throwing up entrenchments stuck the rails in position on the top), and the lecturer pointed out that in the case of Carisbrooke Castle one ward of the fortified enclosure never was completed by masonry, and as the result that portion was now obliterated. That had, he said, led to the fact that there had been a second court being overlooked in some quarters.

Mr. St. John Hope was cordially thanked for his excellent paper, which gave rise to animated discussion.

## COLLAPSE OF THE CAMPANILE.

THE correspondent of the *Scotsman*, in a letter dated July 19, writes:—

Having now been granted a special Ministerial permit to go inside the barricade and view the work of excavation when I choose, I spent some time amongst the ruins to-day. As the strictly guarded door opened and closed upon me, I felt a sense of sadness I had not felt before. I was alone, almost alone, amongst strangers. All my old architect friends with whom I had often talked about the Doges' Palace and St. Mark's Church, and from whom I had received valuable information, and who were unfailingly courteous and kind, had gone—collapsed like the Campanile. Last night the Ministerial Commission, under the presidency of His Excellency G. Nasi, Minister of Public Instruction, reached its first decision, which is a very serious one, and which has led to immediate serious action. Also the Prefect of Venice, the Marquis Cassis, has pronounced judgment on the "Fabbriceria," the vestry board of St. Mark's Church, which had immediate charge of the Campanile. The decisions of the Ministerial Commission run thus:—

"Considering that the 'Ufficio Regionale di Venezia' must provide for the grave and urgent necessity of preserving its numerous and celebrated monuments, recognising, further, the need of giving to the Direction all the power it requires for its grave task, avoiding all conflicting interests and uncertainties of responsibility decrees.—Art. 1. The Direction of the Ufficio Regionale for the monuments of Venice is entrusted temporarily to the architect, Commendatore Giacomo Boni, who is already invested with extraordinary powers for work upon the Campanile of St. Mark's.—Art. 2. And Commendatore Boni is invested with power to propose such substitutions and such augmentation of functionaries that he deems opportune for the carrying out of his mission."

In accordance with these decrees, Commendatore Berchet, the head architect of the office for public monuments, which has its seat in the Doge's Palace, delivered up the keys of his office and all his documents to Commendatore Boni. The architect Rupolo, who superintended the work of cutting into the Campanile about Sansovino's Loggetta, and so caused the collapse, was the architect Berchet's lieutenant.

As I have already said in a previous article, St. Mark's Church and the Campanile were under the care of the Fabbriceria of St. Mark's Church—that is, its vestry board—on which sat the patriarch, some canons and some lay members, and whose architect was Signor P. Saccardo. By command of the Prefect of Venice, the Marquis Cassis, this has been dissolved. The decree runs thus:—

"The Prefect, learning that the vestry board of St. Mark's Church, to which was entrusted the custody and the preservation of the edifice, although it had since several days been warned of the damage, and were aware of its gravity, yet gave no notice whatever of it to the rightful authorities until the last moment, exposing thus to grave peril the safety of the people, and increasing the peril of damage to objects of art, and realising the necessity of providing for the supreme interests of public safety, and for the preservation of St. Mark's Church in a worthy manner, has dissolved the Fabbriceria, and has temporarily suspended from his functions the architect, Sig. Saccardo, nominating as Commissioner Extraordinary Cav. Michael Spiriti, of the Prepelina. This decree is accompanied by a report of His Excellency the Minister of Public Instruction."

To return to the ruins. The debris has been cleared entirely away from St. Mark's Church. The church has sustained marvellously little damage. Round the base of the church there is a panelling of marble that is about 20 inches high and 20 inches broad; it forms a sort of low seat or ledge. This has been chipped more or less all the way from the main door to the south-west angle, and in places, as it is hollow, has been driven in. The angle itself, which was buried in debris, is only slightly broken. As the materials of the tower are not only precious in themselves, but are expected to throw light on the nature and epoch of its erection, they are being carefully sifted out into distinct heaps. For example, a quantity of Aquileian bricks entered into the Campanile. These are of different forms and sizes, some small, others long and thick,

and others square, measuring 16 inches across, like flags for paving. It is sad to see the beautifully carved capitals split and broken and marble columns broken in pieces. Still, it is wonderful how some things have been preserved. The statue of Mercury has been recovered with but an arm broken and some fingers of the other hand. The library portion of the Royal Palace is much more damaged than I thought it was. Under the arcade on the Piazzetta side are shipping offices. Five of these are involved more or less in the ruins. The vaulted roof, too, is cracked and shattered in places. As the columns here are broken, and are only held up because buried in ruins, the palace must be well shored up before excavations at this part can begin.

The workmen, with one or two exceptions, are all soldiers. They are dressed in white clothes and wear big straw hats, for the sun is scorching at present. Soldiers have been employed as they are good workmen, and also to prevent any stealing.

Already about two million francs have been received, and the third million required will soon be forthcoming. It is believed that the foundations are intact, only as they were intended to carry a comparatively shorter and lighter campanile than that which has collapsed, they will be enlarged, if not renewed, and this may cost half a million francs more. A question about the stability of the Doges' Palace is being raised. What about the removal of the Marciano Library, the weight of the books of which is dragging the palace down? It is two years since the Chamber of Commerce left the Zecco, so as to leave it clear to receive the books, and yet nothing has been done. I believe a contract, however, has been signed last week, and that the architect Boni, who is a Venetian, though till now labouring in the Roman Forum, and who is in accord with Luigi Vendrasco, will see that no unnecessary delay takes place. Our Prefect, too, the Marquis Cassis, is young, able and active.

A correspondent of the *Globe*, writing on July 21, says:—We have learned much during these few days since the great catastrophe of the carelessness and culpable negligence of everyone concerned—from the young architect to the Ministers of the Crown, who, year after year, turned a deaf ear to the remonstrances of Signor Vendrasco and a few others; and much discussion has taken place as to whether the Campanile should or should not be rebuilt, and, if rebuilt, on what site. But to-day comes another simply stupendous revelation, and that is that, should they decide to rebuild it, absolutely no plans, nor designs, nor architectural drawings, nor measurement of the Campanile exist anywhere by which it can be rebuilt. During all these last twenty years that it has been known to be in a perilous condition no one troubled themselves to copy anything nor to measure anything; no one even knows its exact height. No one made the roughest measurements nor the merest sketch. This astonishing fact has come out, because Signor Nasi—the only man in authority blameless as regards the destruction of the Campanile, as he only came into office the other day—made first a clean sweep out of all the officials in the Ufficio Regionale for the Conservation of Monuments, and took possession of their papers, and then proceeded to do the same with the Fabbriceria of St. Mark's, the vestry or committee charged with the care of the basilica and its treasures, and this he has done coolly and mercilessly, although the very Patriarch of Venice, the Archbishop Sarto, was its president. Here, too, all the papers were seized, and here, as at the other office, was discovered this complete absence of anything whatever in the shape of plans and drawings. Money is being poured in for the purpose of rebuilding it as it was. But how is this to be done with not even the vestige of anything to go by?

This morning as we paid our daily visit to the ruins to see what new precious fragments have been recovered, we noticed a young man among the great fragments of stone that are being collected one by one as they are disinterred from the mass of debris, with a small drawing-board, a photograph about 18 inches high of the Campanile, a slight sectional tracing, very incomplete and rudimentary, of its interior, a microscope and a pot of red paint. Being always on the look out for information, we inquired what he was doing; and after telling us the facts I have stated above, he said that he had been entrusted by Commendatore Boni, who has now entire charge of all the departments, with the task of sorting and arranging all the different blocks according to the divisions of the various courses which by means of the microscope he is able to recognise in the photograph. Then, as he identifies a stone, he marks it with his red paint and notes it down on his elevation. His work will afterwards be gone over again by others and corrected if necessary. Thus this young fellow, Signor Torres, will microscopically reconstruct the great Campanile from a photograph. It is a crying scandal that it should be so. The only help existing is the rough outline and section done a hundred years ago by an old builder named Zanotto.

We then said to him, "But Sansovino's Loggia? Of that, of course, they have every detail?" And his answer was,



"Yes, but only by the merest chance, and that was because a student at the Accademia two years ago chose it for his examination studies. There are one or two of Sansovino's original sketches, but not exactly as they were ultimately carried out." Such a state of things seems incredible; but there is young Torres with his microscope, working patiently away every day at each new block as it is added to the heap around him to testify to the truth of what I say.

Signor Boni, with his vast experience of excavating at Rome for precious things, has a splendid little army working under him. Literally an army, for the work of clearing away the huge pile of ruins is done by a company of soldiers with their officers, intermixed with a few of the more trustworthy workmen belonging to the basilica. They are as careful as they are energetic, and it is a marvel to know that from the masses already turned over of the refuse of those 18,000 tons of material they have recovered two of the four fingers that are missing from Sansovino's small figure of Mercury (found on Wednesday) that ornamented, with three others, the façade of the Loggia. The men work with a will under the fierce sun-striking heat of the morning, which is almost unbearable, even in their light clothes of brown holland and their big straw hats, for in such cases red tape and heavy uniforms are thrown to the winds.

We went into the lower chambers and courts of the Doges' Palace, all now closed to the public, but to which our passes, given us by the Prefect and the head architect, Signor Boni, admitted us freely, to see in what condition are the splendid bronze gates of Sansovino's Loggia. It is wonderful that, with the exception of a little bending and the breaking off of a lion, which was also at once found, they have suffered little damage. Of Sansovino's bronze statues no hope was entertained, they being small and hollow; all felt sure they would be shattered to pieces. Great was the delight, then, when that of Mercury was discovered, almost unscratched and unharmed, except for the loss of the four fingers of the upraised right hand and the little finger of the delicately drooping left one. "We mean to find that, too," said the soldiers.

Amid its sorrow and anger, Venice rejoices somewhat to-day, because the removal of material that half-covered the bell, which lies, open-mouthed to the sky, half-way up the rocky torrent, and which in my first letter I, like the rest of Venice, called the "Terzetta," turns out to be instead the "Marangona," the one whose midnight boom, sounding out in the still night, was so dear to the Venetians and to travellers alike. That is the great "Campanon," which has pealed out the victories of the Republic during so many centuries. The "Marangona" was brought from Candia in 1678, and was first rung on Ascension Day, the chief festival of Venice. It was called "Marangona" because at its tone the ship carpenters, in Venetian dialect the "marangoni," went to their work in the arsenal, and at its call they left it. At midday it sent them to their meal and rest, and at midnight all knew they could sleep in safety till morning, because the guards were changed and all were alert. The "Marangona" told the city if the home-coming fleet, which the watchman on its summit descried in the offing, was coming with broken mast and tattered sail—the sign of misfortune—or if its flags, joyously flying from their masts and their enemies' banners dragging behind them in the water, showed it was news of victory it brought. I said the "Terzetta" meant to ring again. Far better news is it that we may all hope that in a few years the great and loved "Marangona" will once more peal out the joys and knell the sorrows of the coming generations of Venice.

## HOUSES AND LEGAL HOUSES.

JUDGMENT was given on Monday in the House of Lords in the important case relating to the branch of the Westminster Bank in the Strand. It was an appeal, says the *Times*, from an order of the Court of Appeal (the Master of the Rolls and Lords Justices Stirling and Mathew), dated December 2, 1901, which dismissed with costs an order of the King's Bench Division (Justices Kennedy and Phillimore), dated May 15, 1901. The hearing below is reported in 18 *The Times Law Reports*, 133. The question was whether upon the true construction of the Inhabited House Duty Acts the appellants were to be assessed to such duty in respect of the whole of their premises in the Strand as one single hereditament, or only the third and fourth storeys were so assessable. The facts are given in Lord Macnaghten's judgment, and were, in short, that the ground floor and basement were occupied for business purposes; the ground storey communicated internally by a staircase with the basement—the only access to the basement; that the bank manager had a private door through which he could enter the bank premises from the common staircase; that there was an entrance from the street to all the storeys and a lift; that the first and the three self-contained rooms of the second storey were occupied, as lessees of the bank, by Messrs. Robbins, Billing &

Co., solicitors, and the rest of the second floor by their undertenants, Messrs. Taylor, Willcocks & Lemon, solicitors; and that the third and fourth storeys were occupied by the bank manager as his private residence. The Courts below decided in favour of the Crown. Though the question was one of inhabited house duty under 48 Geo. III, c. 55, the governing section was the 13th of the Customs and Inland Revenue Act, 1878. By subsection (1) of that section "where any house, being one property, shall be divided into and let in different tenements, and any of such tenements are occupied solely for the purposes of any trade or business or of any profession or calling by which the occupier seeks a livelihood or profit, or are unoccupied, the person chargeable as occupier of the house shall be at liberty to give notice in writing at any time during the year of assessment to the surveyor of taxes for the parish or place in which the house is situate, stating therein the facts; and after the receipt of such notice by the surveyor the Commissioners, acting in the execution of the Acts relating to the inhabited house duties, shall upon proof of the facts to their satisfaction grant relief from the amount of duty charged in the assessment so as to confine the same to the duty on the value according to which the house should in their opinion have been assessed if it had been a house comprising only the tenements other than such as are occupied as aforesaid or are unoccupied." Subsection 2, "Every house or tenement which is occupied solely for the purposes of any trade or business, or of any profession or calling by which the occupier seeks a livelihood or profit, shall be exempted from the duties by the said Commissioners upon proof of the facts to their satisfaction, and this exemption shall take effect although a servant or other person may dwell in such house or tenement for the protection thereof." The appellants relied mainly on the second subsection, and also on the Scottish appeal of *Grant v. Langston* (*The Times Law Rep.*, 1900; A.C., 383, 69 L.J., P.C., 66). That case was that of a public-house, the floor above the licensed premises being used as a private dwelling-house. There was, however, a separate entrance from the street to the upper floor, and no communication between the public-house and the dwelling above.

The Lord Chancellor, in moving that the appeal should be dismissed, said that the whole question was now covered by authority, and he was not disposed to upset the current of cases which had dealt with it. The question was, What was a house in the ordinary sense, and what were the artificial creatures called legal houses? One must accept and not criticise the work of the legislature, and it was the duty of the Court simply to construe the words of the Acts. The whole code was devised not so much on principle as for convenience of assessment, and plain and popular language was used. He would not repeat what had been so often said as to the artificial nature of the language employed from time to time in these Acts, but this case was beyond the reach of argument. The landlord—the bank—occupied part of the house, and there was internal communication between one part and the other of the building. Notwithstanding the ingenuity of Mr. Danckwerts's argument, the case was clear; the landlord did occupy part, and there was internal communication. It was a dwelling-house, and part was occupied by the bank, and there was no need to repeat the forcible reasoning of Lord Justice Mathew which he adopted.

Lord Macnaghten: I am of the same opinion, and I must say that the case seems to me to be tolerably clear. The London and Westminster Bank are the owners of a building comprising Nos. 217 to 221 Strand. That building is undoubtedly an inhabited dwelling-house within the meaning of the House Tax Act, and *prima facie* assessable to the tax. It is for those who claim exemption to make out their case. Now part of this house is occupied by the bank, part is let and occupied as solicitors' offices. It will be convenient to consider these two parts separately. As regards the bank, it occupies and uses the ground floor and basement as bank premises properly so called. Two of the upper floors they occupy as the residence of their manager. These two parts are not separate houses or tenements. They are parts of one house with an ordinary communication between them by means of a door under the control of their manager. There is no ground that I can see on which the bank can claim exemption. The bank manager is not a caretaker. The case is the ordinary case of a person using part of his house as a residence and part as his place of business. If it had not been that the part of the house between the bank premises and the manager's residence is let and used as solicitors' offices, I do not think ever would have occurred to anybody that the bank could claim exemption. Then can exemption be claimed for the part of the house which is let and used as solicitors' offices? It is admitted that exemption cannot be claimed under subsection 1 of section 13 of the Act of 1878. It has been decided that the fact that the owner occupies part of the house would be fatal to a claim under that section even if there were sufficient structural division. It is said, however, that the tax is laid upon the occupier, and that the bank is not the occupier



of the offices which they have let off for a term, and into which they have no right of entry except for certain purposes specified in the lease. That may be perfectly true, but if the bank cannot claim exemption under subsection 1 of section 13 the case seems to be met by the regulations in the Act of 18 George III. I think that the appeal must be dismissed with costs.

Lord Brampton concurred.

Lord Lindley said that there was no doubt that by the manager and caretaker the bank occupied the upper floors. He had at first some doubt as to the occupation by the solicitors, but that doubt had been removed, and he agreed that the appeal should be dismissed.

### PICTISH SCULPTURE.

IN the caves of Wemyss, on the Fife coast, there are still many valuable sculpturings in good preservation, says Mr. John Patrick in the *Scotsman*, although of late years, owing to the symbol caves being allowed to remain open, not a few of the incisions have suffered considerably by mischievous hands. Strange that these registrations of an intellectual phase of human thought of more than a thousand years ago should be at the mercy of the ignorant and the reckless, who have not only travestied, but have utterly destroyed nearly a whole ledge of ancient forms in the Eastern Symbol, or Factor's, Cave. In the darker parts of the caves there is less tampering, fortunately, with the archaic forms, and while recently in the Factor's Cave we found on a dimly-lighted ledge a large and vigorous incision not hitherto known to archaeologists. It appealed to me at once as the representation of a Viking ship, at the stern of which there is the figure of a man steering with an oar, while five other oars project from the broad, well-indentated hull, without any appearance of rowers, however. Both prow and stern have the characteristic Viking curving. The stern is especially conspicuous, and cut as if to give *éclat* to the craft. Its effectiveness is helped, too, by the way it catches the light owing to its leaning towards a deep fissure in a part of the rock.

I should not wonder if the searching eyes of Sir J. Y. Simpson saw this figure, and mistook it for a representation of "some of those anomalous serpents and monsters found on the sculptured stones, as on those of Strathmartin and Meigle." However, he also says, "Perhaps it is intended as the figure of a boat;" but he locates the sculpturing he refers to in the Doo Cave, where, as yet, I have not been able to find any incision answering to his description. From prow to stern this Viking ship incision measures about 2 feet 6 inches. The cutting Sir James noticed was, he says, "2 feet 9 inches long." Perhaps the figure would reach that length in curvature. He may have erred about the name of the cave. Indeed, he had evidently been misinformed about the name of the Factor's Cave, which he calls "Jonathan's Cave," and so it is misnamed in archaeological books.

It seems not a little unaccountable that this typical figure of a Viking ship should have been unknown to archaeologists. Until now the real character of this sculpturing has not been recognised, nor has the figure ever been illustrated in any book or magazine. Yet its incision in this cave would appear to point not only to the time when many of the chief symbols and signs were cut in the caves of Wemyss and on the Scottish sculptured stones, but to the people who designed and incised them. The Earl of Southesk, in his "Pictish Symbolism," pertinently remarks "that no existing theory regarding Pictish symbolism has better claims than that which deduces it from Scandinavia, but it cannot be denied that, to qualify it for general acceptance, this theory requires stronger confirmation than has yet been gained." It may be well, therefore, here to examine the bearings of this complex subject. Any light, no matter how weak, that may be thrown on it may give a suggestion or a reasonable explanation of the mystery.

The one thing that seems most clear about the symbols of Scandinavia and those of the Pictlands is that, although different in many of the designs, their characteristic form and their mythological import are so akin that they could only emanate from one race of men. Both Worsaae and Du Chailly agree that not only the antiquities but the Eddas and the Sagas plainly show the presence of an important race of people of Asiatic origin spreading northwards and westwards before and during the early Christian centuries. And to come near the point of view I take up, I will quote from Worsaae, where he says that it cannot for a moment be doubted that in the last period of the Bronze Age of the North a strong influence from Central Europe set in westwards through France and Britain even as far as Ireland, and, further, that "the lands round the Baltic were thickly inhabited by a warlike people possessing a religion and culture of Asiatic origin. They had secured for themselves considerable wealth in bronze and gold through war, the rearing of cattle, agriculture, seafaring and trade. They possessed a highly-developed workmanship in metals

and a remarkable sense of form, which, taken together, enabled them to modify the foreign shapes and patterns according to their own ideas."

Where can be found, one may ask, a more likely people than these to give us the modified symbolic representation of the Pictlands? Their increasing numbers at home, necessitating the acquisition of new territory, combined with their natural enterprise and their militant as well as their seafaring habits, would form ample reason for their participation in the Viking expeditions, so numerous and terrible from the seventh to the tenth centuries of our era.

So the probable explanation may be that the symbols of the North and South Pictlands owe their origin to Central Europeans—a people who were of the same race as the earlier designers of Scandinavian forms, but who on coming to new lands at a later period of symbolic ideas, designed anew a symbolic representation in accordance with the changed condition of mythological thought. These views are strongly supported by the symbols of the Pictlands, illustrations of which show how the latest European forms mingle and change in world-wide representations.

Further, if we look at the ship-tracings on the rocks of Bohuslehn and of Scania, we find that, although they differ slightly in form, their characteristics are quite vivid in this cave-sculpture of a ship. Moreover, among these very ancient rock-tracings the same ideas prevail as are recorded on the Scottish sculptured stones; the figures of men on horseback in hunting scenes, and those of a more domestic character, mingle with the mythological signs and with the struggling life of the incisors just as the symbolic designs on the rocks and stones of the Pictlands mingle with the figures of men on horseback accompanied by dogs, all in full hunting action, and with many scenes of a later phase of life—the phase of life in a new land.

It may be well to note here that the cutting of this ship-embellish has every appearance of being contemporaneous with the other chief sculpturings in Wemyss Caves, which, although primitive looking in form, clearly evince a knowledge of the newer and modified symbolism of the better executed forms on the sculptured stones. But perhaps the rudeness of the cave-tracings may be owing to the inaptitude of their incisors, who, most likely, were the commoner class of people—mere cave-dwellers, probably, possessing the same mythological faith as that of their brilliant masters and leaders. Wemyss Caves still possess many proofs that they had been long used as human habitations.

### THE MANCHESTER ROYAL INFIRMARY.

THE following "Memorandum for information of trustees" and the reply will suggest the peculiar condition in which the project for rebuilding now stands:—

When voting on the question of rebuilding it may be of use if the trustees have before them the following facts:—

1. The Board of Management have consistently endeavoured from year to year to give effect to the wishes of the trustees as expressed by a majority in public meeting assembled.
2. As regards Lord Egerton and his Newcastle argument, the gentleman who then presented a free site outside the city gave also 100,000*l.* for building purposes, and another donor subscribed a further 100,000*l.*
3. In rebuilding it is provided that no in-patients will be disturbed, but that they will be moved direct from present wards into wards in the new building as they are completed.
4. In fifteen months 200 and in twenty-four months 300 beds in the new building will be ready for use by patients.
5. The architects are prepared to meet any reasonable requirements for street widening that may be proposed by the Corporation without interfering to any important extent with the plans of the new building.

6. No sale of infirmary land can take place without the sanction of the Charity Commissioners and an Act of Parliament.

7. If the infirmary site—the Corporation having already refused to purchase it in part or in whole—is sold to the public it must be used for building purposes, in which case what becomes of the open space argument?

8. If the infirmary were divided into two parts, one on the present site and other at Stanley Grove, instead of all on one site, it has been demonstrated that the additional cost of the two establishments would amount to 3,000*l.* per annum.

A reply to this memorandum has been issued and is as follows:—

When voting on the question of rebuilding it may be of use if the trustees have before them the following facts:—

1. The Board have consistently endeavoured from year to year to frustrate the wishes of the trustees as expressed by a majority in public meeting assembled as to the site.
2. Lord Egerton cogently made a most appropriate comparison from his own experience. How do the Board know



that the Lancashire people will not be equally liberal, if in smaller sums, as the Newcastle? The Board have never in their history propounded a scheme for building elsewhere. Such schemes have always originated from outsiders, and the Board have calmly folded their arms and waited complacently for the Corporation or anybody else to find the money, so that both scheme and money must always come from others. The proposals of the Board have always been to rebuild on Piccadilly site. Do they expect anyone to offer 100,000*l.* towards that?

3. Do the Board wish to persuade the trustees that the hammering and noise of pulling down a great building and erecting a new one, plus the noise and roar inseparable from the present site, will not disturb the patients? The trustees and men of Manchester are not so foolish as to accept such a theory.

4. This is manifestly impossible. To pull down a huge building and erect another of really substantial character in fifteen months will not strike the trustees as reasonable. Even if it were possible, the building would be totally unfit to receive patients who are suffering and dying. Eminent experts have confirmed this view to-day.

5. How can "the architects meet any reasonable requirements" for street widening with a margin of only 8 yards? To run double tram lines around by George Street and Parker Street would make the new buildings actually abut on the foot-paths: Where is the theory for quiet and non-disturbance of patients?

6 Applications to the Charity Commissioners and Parliament are an everyday occurrence. No one wishes the site to be covered (except the Board), but to argue the application to the Charity Commissioners and Parliament in itself as a valid reason for putting a new infirmary on the present site only proves what a poor case the Board are able to make out.

7. It is erroneous to say the site must be sold for building purposes. Cannot it be sold in whole or in part to the public for an open space? Is this suggestion beyond the limits of the imagination of the Board?

8. A reception-house for urgent accidents on the present site need only be very small—say twenty beds. The majority of accidents from railway stations and the southern part of the town would naturally go direct to Stanley Grove in motor ambulance carriages with pneumatic tyres. Twenty beds at 50*l.* per bed for maintenance would be 1,000*l.* per annum, and even this would not be all additional expense, because the patients occupying beds in the receiving-house would be relieving beds at Stanley Grove. There could therefore only be a very small amount of overlapping. The figure of 3,000*l.* therefore seems to be utterly misleading. Even, however, if it were correct, the Board are proposing to throw away more than ten times this amount per annum in interest alone by their proposal.

N.B.—Vote against the motion.

### THE MULREADY PRIZE.

THE Council of the Society of Arts are prepared to offer, under the terms of the Mulready Trust, a gold medal or a prize of 25*l.* for competition amongst students of the schools of art in the United Kingdom, at the annual national competition to be held in 1903. The prize is offered to the student who obtains the highest awards in the following subjects:—(a) A finished drawing of imperial size from the nude living model. (b) A set of time studies on a small scale, from the nude living model, executed in a short time, of varied shortly sustained poses (mounted on not more than two imperial size mounts). (c) A set of studies of hands and feet from the living model (mounted on not more than two imperial size mounts). (d) Drawing from the life, including memory life drawing done at the examination on May 9, 1903. No student will be eligible for the award who does not pass in the examination (d) in drawing from the life, and who does not obtain an award for (a) the finished drawing of imperial size from the nude living model. The other two subjects are optional. The works must be those of the previous school year. The recipient of a prize awarded under this trust in 1892, 1893, or 1896, cannot compete again. The drawings, &c., are to be submitted, with other school works, in the usual manner to the Board of Education, South Kensington, in April, 1903. Each competing drawing must be marked "In Competition for the Mulready Prize," in addition to being labelled according to the regulations of the Board of Education.

M. Eustache, who was awarded the médaille d'honneur in the Salon for his view and restoration of the Sacred Way at Rome, has been nominated for the Legion of Honour. He obtained the Prix de Rome for architecture in 1891.

### GENERAL.

**The Jury** appointed to judge the houses constructed during 1901 in Paris includes the following architects, MM. Bouvard, Sauzet, Vaudremer and Bartaumieux.

**French Archaeologists** attach much importance to the discovery of four bronze hatchets at La Glacière, near Cherbouurg. They correspond with those which have been met with near the Swiss village Morges, and are supposed to be evidence of a connection between the two districts.

**The Great Northern and Strand Railway Company** have let a contract for the immediate construction of the line to Messrs. Walter Scott & Middleton, of Westminster.

**A Syndicate** has been formed in France for the protection of the picturesque rocks which are found on the sea-coast at Ploumanac'h, in Brittany. They have often been introduced in pictures, and it is reported that an arrangement was made to utilise them for building stones.

**The London County Council** have decided to take down the Coronation stands erected by them. After deducting all cost connected therewith, the balance will be handed to the ticket-holders, who have paid 25*s.* for a seat.

**M. Ferdinand Humbert** has been elected member of the Académie des Beaux-Arts in succession to the late M. Benjamin-Constant.

**M. Siéfert** has obtained the Prix de Rome for painting. He was a pupil of MM. Gérôme, Guay and Maignen. The Prix de Rome in sculpture was won by M. Alphonse Terroir, a pupil of M. Barrias; and in medalling by M. Victor Dautel, a pupil of MM. Barrias and Dubois.

**The Guildhall** art loan exhibition of pictures by French and English artists closed on Saturday. The exhibition has been visited by over 170,000 persons.

**The London County Council** have passed a vote of 10,933*l.* in settlement of contractor's extras in connection with the demolition of the old Vauxhall Bridge and the partial construction of the new one. This was recommended on the distinct understanding that the present contract will be completed this year, so that contracts for the superstructure of the bridge may be invited without further delay. There is likely to be a very substantial alteration in the plans for the erection of the bridge.

**The Prefect of the Seine** has approved of the project of M. Edouard Détaillé for an exhibition of sign-boards in Paris. All the official regulations have now been complied with, and the exhibition will be opened during the coming autumn.

**The Metropolitan Asylums Board** have accepted the tender of Messrs. W. Johnson & Co., Ltd., of Bellevue Road, Wandsworth Common, for the erection, at the sum of 174,750*l.*, of the Southern Hospital, in accordance with plans and specifications prepared by Messrs. Treadwell & Martin, architects.

**A Memorial** has been erected in the Market Place of Brussels to Everhard T'Serclars, who was one of the Flemish heroes of the Middle Ages, and took a principal part in the liberation of Brussels in 1356.

**The Building Act Committee** of the London County Council report that they have given instructions for the recommendations of the coroner's jury in connection with the fatal accident which occurred on July 10 at Langham Place, through the falling of a piece of coping from the parapet of All Souls Church, to be noted for consideration in connection with the general question of the amendment of the London Building Acts. The structure has been surveyed in pursuance of powers relating to dangerous structures, and arrangements are being made for the removal of the greater part, if not the whole, of the balustrades, and for replacing them in Portland stone.

**Messrs. Scamell & Colyer**, architects, have removed from 14 Victoria Street, S.W., to 41 Old Queen Street, Westminster, S.W.

**The Oxford School of Egyptologists** have been exhibiting at the Ashmolean Museum a collection of pottery and other remains, discovered during 1901-2 at Regagnah and Berkhallafin, Upper Egypt, by Mr. John Garstang, of Jesus College. Among the objects are specimens of prehistoric ware, the provisional date for which may be given as B.C. 5000; numerous remains of the third dynasty (B.C. 4000), among which are alabaster "offering tables," copper vessels, knife and spoons, and a perfectly preserved macehead of limestone carved with a delicate rope-pattern, and the head fitted with an inlaid ivory cap. Of the thirteenth dynasty the remains include a stele in remarkable preservation, with a curious shrine on the reverse side, of which some early iconoclast had defaced the figure as that of an alien deity. The eighteenth and nineteenth dynasties are represented by numerous (so-called) ushabti figures (Egyptian equivalents of the Tanagra statuettes), scarabæi, beads and other ornaments, with two pairs of gold bracelets in excellent condition.



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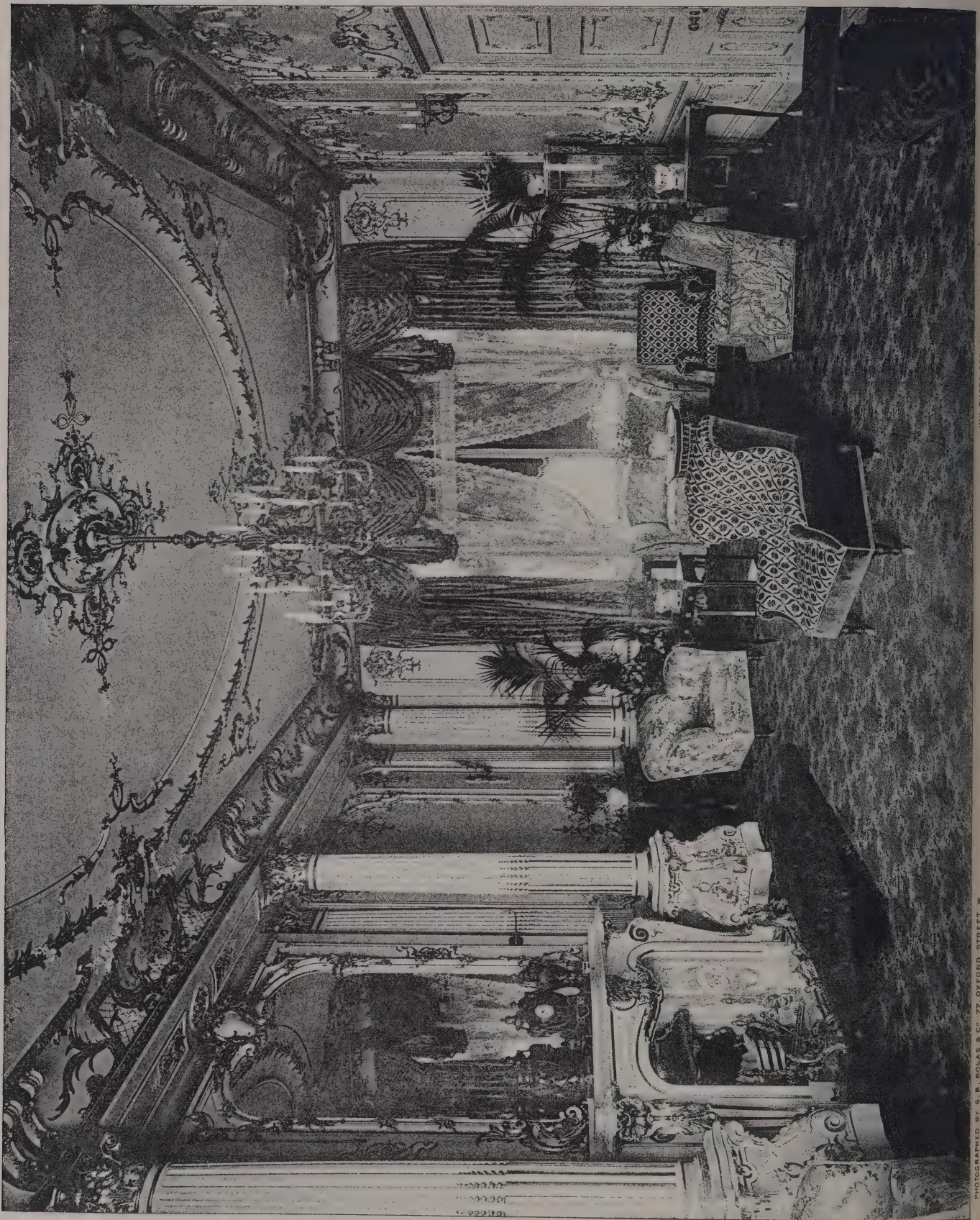
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CATHEDRAL SERIES, No. 400.—HEREFORD: FROM SOUTH AISLE, LOOKING INTO NORTH TRANSEPT.









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CORNER OF MR. M. MENPES' STUDIO, LOOKING TO DRAWING ROOM.









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THE "HOPE" INN, LEEDS.

W. MASON COGILL, Architect.



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THE

## Architect and Contract Reporter.

## EDITORIAL NOTICES.

*In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

## TENDERS, ETC.

*\*\*\* As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

## COMPETITIONS OPEN.

**BERMONDSEY.**—Sept. 16.—Designs are invited for artisans dwellings to be erected on land at Rotherhithe, within the borough of Bermondsey, and known as the Fulford Street area. Premiums of 100*l.*, 60*l.* and 40*l.* will be awarded. Mr. Fredk. Ryall, town clerk, Town Hall, Spa Road, S.E.

**BIDEFORD.**—Sept. 25.—The Town Council of Bideford are about to erect municipal offices and a public library upon a site opposite the west end of the Long Bridge, Bideford, and they invite designs for the proposed buildings. Premiums of 30*l.*, 15*l.* and 10*l.* respectively are offered for the designs which shall be placed by the Council first, second and third in order of merit. Designs and descriptions, &c., are to be delivered to Mr. Wm. B. Seldon, town clerk, 18 The Quay, Bideford.

**DEPTFORD.**—Aug. 30.—Competitive designs are invited for a town hall and municipal offices. Premiums of 100*l.*, 75*l.* and 50*l.* are offered for the three selected designs. Mr. Vivian Orchard, town clerk, Municipal Offices, 20 Tanner's Hill, Deptford S.E.

**INDIA.**—Nov. 1.—Competitive designs are invited for the erection of a memorial to Her Majesty the late Queen Victoria

at Allahabad. A premium of 2,000 rupees will be awarded to the design selected by the committee. Mr. H. Nelson Wright, Indian Civil Service, honorary secretary, Queen Victoria Memorial Fund Committee, Allahabad, India.

**LIVERPOOL.**—Sept. 15.—Designs are invited for new labourers' dwellings to accommodate about 2,500 persons, to be erected on the Hornby Street area. Premiums of 250*l.*, 150*l.* and 100*l.* respectively are offered for the first three selected designs. Particulars will be supplied by the Town Clerk.

**MAIDENHEAD.**—Oct. 1.—Designs for free library. Premiums offered of £50, £20 and £10 respectively. Mr. John Kirk, town clerk, Guildhall, Maidenhead.

**SOUTHEND.**—Sept. 7.—Designs are invited for a church to accommodate 500 persons, a clergy-house, and a parochial hall or parish-room about 50 feet by 30 feet. Mr. C. H. J. Talmage, Kathlene Villa, Southchurch Road, Southend-on-Sea.

**SUNDERLAND.**—Aug. 30.—Designs are invited for proposed police and fire-brigade buildings to be erected in Gill Bridge Avenue and Dun Cow Street. Premiums of 100*l.*, 50*l.* and 25*l.* are offered for first, second and third designs respectively. Mr. Fras. M. Bowey, town clerk, Town Hall, Sunderland.

## CONTRACTS OPEN.

**ASPATRIA.**—Aug. 9.—For erection of two houses and shops at Aspatria. Mr. Geo. Armstrong, architect, 24 Bank Street, Carlisle.

**AYCLIFFE.**—Aug. 6.—For erection of a cottage near Aycliffe. Mr. F. H. Livesay, architect, 107 Newgate Street, Bishop Auckland.

**BARNES.**—Aug. 14.—For erection of a new infants' school for 350 children in Railway Street, Barnes. Mr. C. Innes, architect, 50 Cannon Street, E.C.

**BARNESLEY.**—Aug. 6.—For erection of fifteen houses and shop, outbuildings and boundary walls, Greenfoot Lane, Old Town, Barnsley. Messrs. Crawshaw & Wilkinson, architects, 13 Regent Street, Barnsley.

**BISHOP AUCKLAND.**—Aug. 11.—For alterations and additions to manager's house, colliery offices, stabling, &c., at Chilton Colliery. Mr. F. H. Livesay, architect, Bishop Auckland.

**BISHOP'S STORTFORD.**—Aug. 4.—For additions to the isolation hospital at Bishop's Stortford. Mr. E. T. Watts, surveyor, Thorley, Bishop's Stortford.

**BISHOP'S STORTFORD.**—Aug. 11.—For erecting boundary-wall 600 feet in length by 8-feet high at the gasworks. Mr. W. J. Gee, secretary, Water Lane, Bishop's Stortford.

**BOSFRANKAN.**—Aug. 19.—For erection of a stable and wainhouse, &c., at Bosfrankan, Cornwall. Mr. George Gow, Tregothnan Office, Truro.

**BOSTON SPA.**—For supply of slates and slating and plastering of a new wing to residence, and the taking off and reslating of present house. Mr. H. Noble, Paradise Nurseries, Boston Spa.

**BOURNEMOUTH.**—Aug. 5.—For erection of a urinal at Meyrick Park. Mr. F. W. Lacey, borough engineer.

**BRADFORD.**—For erection of a bungalow on the Burley building estate. Mr. W. H. Herbert Marten, architect, Cheap-side Chambers, Bradford.

**BRADFORD.**—Aug. 6.—For erection of a store and three houses in Great Horton Road and Summerville Road, Bradford. Mr. Wm. Rycroft, architect, Bank Buildings, Manchester Road, Bradford.

**BROMPTON.**—Aug. 11.—For extension of weaving-shed premises at Brompton, near Northallerton, Yorks. Messrs. T. Winn & Sons, architects, 92 Albion Street, Leeds.

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**BURNHAM-ON-CROUCH.**—Aug. 25.—For erection of an engine-house at the waterworks, Burnham-on-Crouch. Mr. E. Dillway, High Street, Burnham-on-Crouch.

**CHACEWATER.**—Aug. 12.—For additions and alterations at Chacewater and Scorrer stations, for the Great Western Railway Company. Mr. G. K. Mills, secretary, Paddington Station.

**CHESTER.**—Aug. 5.—For alterations at Upton Asylum, Chester. Mr. H. Beswick, county architect, Chester.

**CHESTERFIELD.**—Aug. 9.—For construction of a new main outfall sewer at Cresswell, for the Clown Rural District Council. The works will comprise about  $1\frac{1}{2}$  miles of 12-inch stoneware pipe sewers, together with all manholes, ventilators, flushing arrangements and other appurtenances. Mr. James Snow Whall, clerk, 44 Bridge Street, Worksop.

**CHESTERFIELD.**—Aug. 11.—For erection of infirmary, nurses' home, laundry and other works at the workhouse, Newbold Road, Chesterfield. Messrs. Rollinson & Son architects, 13 Corporation Street, Chesterfield.

**CROOK.**—Aug. 6.—For erection of a farmhouse at Watergates, near Crook. Mr. F. H. Livesay, architect, 107 Newgate Street, Bishop Auckland.

**DEWSBURY.**—Aug. 7.—For erection of a weaving-shed, 62 yards by 55 yards, and a 50 yards boiler-chimney at Queen's Mill, Savile Town. Messrs. John Kirk & Sons, architects, Dewsbury.

**DINAS.**—Aug. 5.—For erection and completion of a residence at Dinas, Padstow, Cornwall. Messrs. Wise & Wise, architects, Launceston.

**EBBW VALE.**—Aug. 11.—For erection of a coach-house and stable at Hill Side House, Ebbw Vale. Particulars may be obtained at the House Agent's Office, Ebbw Vale.

**GAINSBOROUGH.**—For erection of stable buildings, including entrance, five loose boxes, six stalls, coach-house, &c., at Gate Burton, near Gainsborough. Mr. E. F. Green, architect, Gainsborough.

**GOSFORTH.**—For erection of two self-contained dwelling-houses in Gosforth. Mr. John Fisher, solicitor, 75 Pilgrim Street.

**HERTFORD.**—Aug. 9.—For alterations and additions to porter's lodge at the union workhouse. Mr. Russell Austin, 13 Villiers Street, Hertford.

**HEYWOOD.**—For erection of a bakery and stables, &c., in Gorton Street, Heywood. Messrs. Openshaw & Gill, architects, Bury, Lancs.

**HOLMFIELD.**—Aug. 11.—For erection of three houses and a shop at Holmfild. Messrs. Petty & Ives, architects, 12 Waterhouse Street, Halifax.

**HOOLE.**—Aug. 9.—For erection of walling and fencing around the proposed recreation ground situate between Canadian Avenue and Bate Avenue, Hoole. Mr. Arthur E. Caldecutt, clerk to the Urban District Council, 17 Newgate Street, Chester.

**IPSWICH.**—Aug. 12.—For erection of a new Inland Revenue office at Ipswich, for the Commissioners of H.M. Works and Public Buildings. Messrs. H. Gritten & Son, 8 Princes Street, Westminster.

**IRELAND.**—Aug. 4.—For providing and fitting-up two urinals in Larne. Mr. W. G. Yonge, clerk to Urban District Council, Town Hall, Larne.

**IRELAND.**—Aug. 5.—For erection of a villa at Castlereagh, co. Down. Mr. J. V. Brennan, architect, Belfast Bank Chambers.

**IRELAND.**—Aug. 6.—For erection of fourteen labourers' cottages (including out-offices, piers and gates), and the fencing of the acre plots attached thereto; also for the fencing of fourteen plots in the Kinsale rural district. Mr. R. Evans, engineer, 53 South Mall, Cork.

**IRELAND.**—Aug. 12.—For erection of a Crown post office and postmaster's residence at Cahir, co. Tipperary. Plans and specification can be seen at the Post Office, Clonmel, and at the Office of Public Works, Dublin.

**IRELAND.**—Aug. 15.—For erection of new college, Mullingar, co. Westmeath. Mr. J. J. O'Callaghan, architect, 16 Nassau Street, Dublin.

**ISLEWORTH.**—Aug. 6.—For cleaning and painting the exterior wood and ironwork at the union office, the infirmary and the schools at Isleworth. Mr. W. H. Ward, architect, Paradise Street, Birmingham.

**LEEDS.**—For erection of house at Armley. Mr. Fredk. W. Rhodes, architect, Upper Wortley Road, Leeds.

**LEEDS.**—For erection of two bakehouse ovens. Mr. I. Morris, 66 Bridge Street, Leeds.

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LEEDS.—Aug. 11.—For painting, decorating, &c., various rooms, offices, staircases and corridors in the municipal buildings, Leeds. The City Engineer, Leeds.

LONDON.—Aug. 15.—For repainting and tar-varnishing Chelsea suspension bridge over the river Thames. Particulars of the Engineer's Department, County Hall, Spring Gardens, S.W.

MANCHESTER.—Aug. 11.—For putting-in the foundations for coke-storing plant at the Gaythorn gas station. Mr. C. Nickson, superintendent, Gas Department, Town Hall, Manchester.

MANCHESTER.—Aug. 12.—For tiling of the floors and walls of the males' first-class wash baths at New Islington, for the baths and wash-house committee. The Chairman of the Baths, &c., Committee, Osborn Street, Manchester.

MANCHESTER.—Aug. 12.—For alterations to the males' first-class wash baths at New Islington. The Chairman of the Baths, &c., Committee, Osborn Street, Manchester.

MERTON.—Aug. 6.—For erection of parish offices in the Kingston Road. Mr. H. G. Quartermain, architect, Merton Park, Surrey.

MILFORD HAVEN.—For reseating and reconstruction of the interior of Rehoboth Calvinistic Methodist church, Hakin, Milford Haven. Mr. A. S. Chugg, Ashton House, Milford Haven.

OPENSHAW.—For erection of a chapel and school at Openshaw. Messrs. Burton & Percival, architects, 150A Stamford Street, Ashton-under-Lyne.

POPLAR.—Aug. 9.—For painting and decorative repairs at the Poplar town hall, Bromley vestry hall and public health offices. Mr. Harley Heckford, borough surveyor, Council Offices, High Street, Poplar.

ROCHDALE.—Aug. 7.—For supply and fixing of about 500 square yards of 1-inch T. and G. maple flooring, 32 square yards of 1-inch T. and G. teak flooring and 800 lineal feet of 3-inch by 2-inch pitch-pine skirting, required in the west wing at Marland infectious diseases hospital. Mr. S. S. Platt, borough surveyor, Town Hall, Rochdale.

ST. STEPHEN'S-BY-SALTASH.—Aug. 5.—For erection of additional school buildings to the school at St. Stephen's-by-Saltash, Cornwall. Mr. W. J. Carder, architect, 8 Athenæum Terrace, Plymouth.

SCAMMONDEN.—Aug. 7.—For alterations and improvements to Nont Sarah's hotel, Scammonden, and the erection of stables for twenty horses. Messrs. John Kirk & Sons, architects, Huddersfield.

SCOTLAND.—For erection of a dwelling-house and shops, Aboyne. Mr. William E. Gauld, architect, 258 Union Street, Aberdeen.

SCOTLAND.—Aug. 7.—For construction of an underground convenience in West Campbell Street, Glasgow. Mr. J. Lindsay, clerk, City Chambers, Glasgow.

SEAFORD.—Aug. 4.—For construction of a random flint boundary wall, 400 yards long and 5 feet high, with brick piers and wooden gates, at the cemetery. Mr. E. A. Miller, surveyor, 3 Clinton Place, Seaford.

SHIPLEY.—For erection of two semi-detached villas at Moorhead, Shipley. Mr. J. Crawshaw, architect, 1 Norman Drive, Eccleshill.

SLOUGH.—Aug. 6.—For erection of three cottages and tool store on land adjoining Carter's Place, Salt Hill, Slough, Bucks. Mr. R. J. Thomas, county surveyor, County Hall, Aylesbury.

SOUTHSEA.—For erection of a block of business premises at the corner of Elm Grove and Grove Road South, Southsea. Mr. G. E. Smith, architect, 145 Victoria Road North, Southsea.

STOKE FERRY.—For erection of Wesleyan chapel and school, Stoke Ferry. Mr. W. H. Tuck, Stoke Ferry.

TODMORDEN.—Aug. 6.—For erection of Board school and house at Shade, Todmorden. Messrs. Sutcliffe & Sutcliffe, architects, Todmorden.

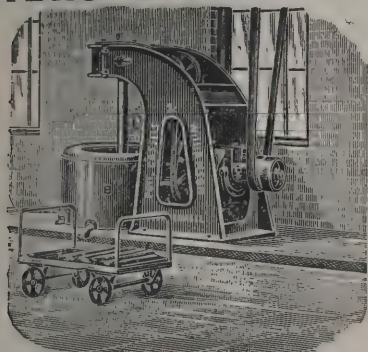
TOTTENHAM.—Aug. 5.—For erection of a fire station, depot buildings, &c., at Conway Road. Mr. W. H. Prescott, engineer, Coombes Croft House, 712 High Road, Tottenham.

TYWARDREATH.—Aug. 11.—For erection of a Board school and out-offices, with boundary walls, &c. Mr. William Julian Samble, architect, Hill House, Par Station, Cornwall.

WALES.—Aug. 6.—For erection of a drill hall at Abertillery. Mon. Mr. F. R. Bates, architect, 26 Westgate Chambers, Newport.

WALES.—Aug. 7.—For erection of a new mixed school at Aman, Aberdare. Mr. T. Roderick, architect, Clifton Street, Aberdare.

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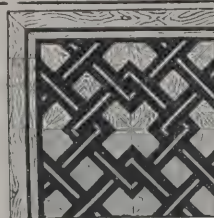
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WALES.—Aug. 7.—For erection of waferooms at 41 and 42 St. Mary Street, Cardiff. Mr. Edward Seward, architect, Queen's Chambers, Cardiff.

WALES.—Aug. 9.—For rebuilding the Coytrahen Arms, shop, two cottages and stables at Bethania Street, Maesteg. Mr. J. Cook Rees, architect, Neath.

WALES.—Aug. 12.—For erection of an office at Swansea (High Street) station, for the Great Western Railway Co. Mr. G. K. Mills, secretary, Paddington Station, W.

WALES.—Aug. 13.—For erection of a villa near Crumlin, Mon. Mr. R. L. Roberts, architect, Crumlin.

WALES.—Aug. 15.—For erection of an electric-power station and car-sheds, Pontypridd. Mr. C. Sidney Watson, Council Offices, Town Hall, Pontypridd.

WALES.—Aug. 18.—For erection of a large hotel, with stables, &c., Jubilee Road, Aberaman. Messrs. Llewellyn Smith & Davies, architects, &c., Aberdare.

WALES.—Aug. 18.—For erection of a stone arched bridge, or, in the alternative, of an iron girder bridge, at the Pitt, Llanarth; and for erection of a stone retaining wall to the bridge at Hendre Glyn, Llanover, Abergavenny. Mr. John Gill, surveyor, 4 Brecon Road, Abergavenny.

WALES.—Aug. 18.—For construction of basements and foundations and other works for the proposed new lunatic asylum at Whitchurch, near Cardiff. Messrs. Oatley & Skinner, architects, Edinburgh Chambers, Baldwin Street, Bristol.

WALES.—Aug. 27.—For erection of a lunatic asylum at Caerleon, Mon. Mr. A. J. Wood, architect, 22 Surrey Street, Victoria Embankment, W.C.

WILLINGTON.—Aug. 14.—For erection of Catholic church and presbytery, Willington, Durham. Mr. John Kelly, architect, 466 Oxford Street, Marble Arch, W.

WOODFORD.—Aug. 9.—For erection of new school buildings on a site in Snakes Lane, Woodford, Essex. Mr. Edward Tidman, architect, 34 Victoria Street, Westminster, S.W.

THE Bishop of Gloucester and Bristol has consecrated the new church of St. Saviour's, Weston-super-Mare. The church has been built in sections, the first section having been opened ten years ago by the Bishop of Bath and Wells. The total cost has been 6,300*l*.

## TENDERS.

### BALDERTON.

For erection of an infant school, accommodating 300 children, on a site adjoining the Great North Road, Balderton. Messrs. SAUNDERS & SAUNDERS, architects, Arcade Chambers, Newark-on-Trent.

T. Barlow . . . . .	£3,878	5	0
C. Saul . . . . .	3,650	0	0
C. Redford . . . . .	3,604	17	6
C. Baines . . . . .	3,600	0	0
F. Messon . . . . .	3,563	0	0
F. Wand . . . . .	3,578	9	6
Hockley & Co. . . . .	3,485	0	0
H. Hurst . . . . .	3,360	0	0
T. G. Mackenzie & Sons . . . . .	3,358	12	4
W. Smith . . . . .	3,248	0	0
G. Henderson . . . . .	3,228	18	0
G. Brown & Son . . . . .	3,187	16	0
F. W. CROSSLAND, North Gate, Newark (accepted) . . . . .	3,144	12	10
Architect's estimate . . . . .	3,150	0	0

### BARROW-IN-FURNESS.

For erection of additional battery-rooms, &c., at the electricity works, Buccleuch Street. Mr. H. R. BENNETT, borough engineer.

W. W. Fairbairn . . . . .	£1,184	2	6
W. Gradwell & Co., Ltd. . . . .	1,161	8	0
J. Cox . . . . .	1,135	10	4
W. Saddler . . . . .	1,125	10	3
T. Brown . . . . .	1,115	10	0

### BILLERICAY.

For construction of a culvert in the parish of Downham, Billericay, Essex. Mr. R. J. W. LAYLAND, surveyor.

Thompson & Wilkinson . . . . .	£80	0	0
Harris Bros. . . . .	60	0	0
Wilson, Border & Co. . . . .	60	0	0
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G. Gentry . . . . .	52	10	0
J. Cox . . . . .	50	0	0
JARVIS & SON, Stock, Essex (accepted) . . . . .	35	10	0

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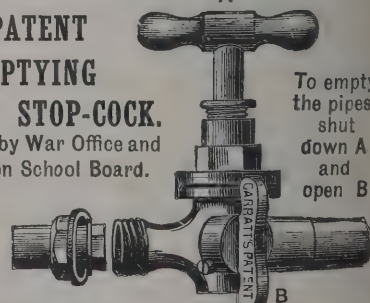
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*Lewes Road School.—Interior painting, &c.*

J. BARNDEN (accepted) . . . . . 189 0 0

*Preston Road school.—Exterior painting, &c.*

W. BROWN & SONS (accepted) . . . . . 75 17 0

*Queen's Park school.—Exterior and Interior painting, &c.*

GATES & SON (accepted) . . . . . 256 10 0

*Stanford Road school.—Exterior and interior painting, &c.*

W. TAYLOR (accepted) . . . . . 259 0 0

*Special children's school.—Exterior and interior painting, &c.*

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S. J. RYDER, 11 Mansard Terrace, Victoria Road (accepted) . . . . . £64 0 0

**DOVER.**

For street works in Eaton Road. Mr. HENRY E. STILGOE, borough engineer.

W. H. GRIGG, Worthington Street (accepted) . . . . . £287 0 0

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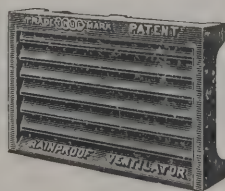
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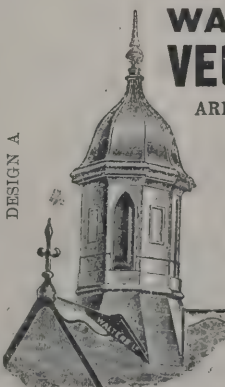
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**HEMINGFORD GREY.**

For erection of a central school and master's house, &c. Mr. WM. WOOD BETHELL, architect.

F. Giddings	£3,850	6	6
Passen & Son	3,659	8	11
W. Howard	3,600	0	0
G. Page	3,538	12	6
F. Markham	3,519	0	0
Skeels Bros.	3,490	6	0
Allen & Sons	3,422	0	0
M. J. Allen	3,257	6	0
St. John & Son	3,097	0	0

**HILLA GREEN.**

For steel superstructure for the Hilla Green Bridge, Yorks. Mr. W. G. BRYNING, county surveyor, Northallerton.  
TEES-SIDE BRIDGE AND ENGINEERING WORKS, LTD,  
Middlesbrough (accepted).

**HORSFORTH.**

For sinking a borehole for water-supply purposes near Scotland Lane. Mr. E. J. SILCOCK, engineer, 10 Park Row, Leeds.

T. Matthews	£2,482	12	0
T. Matthews (alternative)	2,455	17	6
J. Smalley	2,194	0	0
Mather & Platt	1,578	0	0
J. THOM, Manchester	943	0	0

**HULL.**

For erection of the First Baptist church, The Boulevard, Hull.  
*Bricklayer and plasterer.*

F. Bilton	£2,660	0	0
Morill & Sons	2,627	0	0
J. R. Woods	2,586	4	6
J. Carr	2,453	13	3
Hull General Builders	2,430	6	0
H. Moody	2,247	14	0
Simpson & Son	2,247	14	0
H. T. ARNÖTT, Hull (accepted)	2,171	6	7

*Slater.*

Hull General Builders	226	7	6
Williamson	207	13	0
Simpson & Son	207	13	0
SMITH & HUNTER (accepted)	204	14	0

**HULL—continued.***Mason.*

F. Sweeting	£1,376	17	0
H. Drewery	1,200	0	0
G. Crawford & Co.	1,125	0	0
G. H. Panton	995	0	0
Simpson & Son	950	0	0
CHRISTIE PATENT STONE CO., Hull (accepted)	836	4	9

*Joiner.*

G. L. Scott	2,190	0	0
Simpson & Son	2,036	16	0
G. E. Train	1,930	17	6
J. Wilson & Son	1,920	10	0
H. KAYE, Hull (accepted)	1,797	0	0
Hull General Builders	1,628	10	0

*Plumber.*

G. W. Smith & Son	399	10	0
Henningham	380	8	10
A. Johnson	365	9	0
Simpson & Son	363	15	0
W. L. Harrison	359	0	0
W. Hodgson	354	3	6
T. HIRST (accepted)	352	0	0

*Painter.*

Hull Painters	181	10	0
T. W. BAILEY (accepted)	114	8	10

**IRELAND.**

For painting the wood and ironwork of the workhouse buildings, Roscommon.

W. J. ROHAN, Athlone (accepted)	£69	10	0
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Note.—Materials to be supplied by the Board.

**LITTLEPORT.**

For erection of a chapel at the new cemetery, Littleport, Ely. Mr. HEBER G. MARTIN, surveyor.

Scales & Robins	£395	0	0
R. Ruse	357	10	0
J. W. Collins	320	0	0
T. Purdy	298	0	0
T. H. Summerlee	286	10	0
B. LOFTS & G. R. DRAKE, Littleport (accepted)	260	0	0

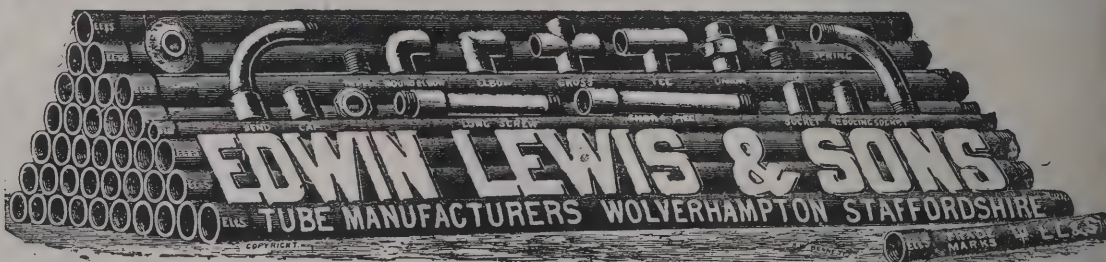
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LONDON SCHOOL BOARD.

For new school, Macmurdo Road site, Fulham Palace Road, Chelsea.

Martin, Wells & Co.	£29,935	0	0
W. H. Lorden & Son	28,444	0	0
Leslie & Co., Ltd.	28,304	0	0
C. Cox	27,960	0	0
J. Greenwood	27,572	0	0
W. King & Son	27,450	0	0
Treasure & Son	27,029	0	0
E. Lawrance & Sons	26,955	0	0
Stimpson & Co.	26,849	0	0
G. E. Wallis & Sons	26,628	0	0
McCormick & Sons	26,144	0	0
Holliday & Greenwood, Ltd.	26,115	0	0
J. & M. Patrick	25,337	0	0
Lathey Bros.	25,160	0	0
W. Johnson & Co., Ltd.*	24,950	0	0

For halls, &c., at Popham Road boys and girls' school, Islington.

W. Gregar & Son	£8,250	0	0
Clarke & Bracey	8,232	0	0
J. Simpson & Son	7,923	0	0
W. M. Dabbs	7,832	0	0
E. Triggs	7,717	0	0
C. Cox	7,713	0	0
J. Grover & Son	7,642	0	0
J. Appleby	7,622	0	0
E. Lawrance & Sons	7,508	0	0
McCormick & Sons	7,332	0	0
General Builders, Ltd.	7,139	0	0
Treasure & Son	6,816	0	0
G. S. S. Williams & Son	6,769	0	0
C. Dearing & Son*	6,633	0	0

\* Recommended for acceptance.

LONDON SCHOOL BOARD—continued.

For special school, Chaucer school, Tabard Street, Borough.

E. P. Bulled & Co.	£3,271	0	0
Holliday & Greenwood, Ltd.	3,262	0	0
F. & H. F. Higgs	3,197	0	0
W. Downs	3,099	0	0
J. Appleby	3,096	0	0
Treasure & Son	3,045	0	0
Johnson & Co.	2,993	0	0
J. Greenwood	2,946	0	0
T. D. Leng	2,869	0	0
E. Triggs	2,867	0	0
J. Marsland & Son	2,812	0	0
W. Johnson & Co., Ltd.	2,799	0	0
Thomas & Edge	2,733	0	0
Turnbull & Son*	2,620	0	0

For new school for boys, Globe Street site, Wapping.

J. Grover & Son	£6,170	0	0
McCormick & Sons	5,872	0	0
C. Miskin & Sons	5,574	0	0
Perry & Co.	5,565	0	0
W. Gregar & Son	5,532	0	0
W. King & Son	5,500	0	0
Stimpson & Co.	5,400	0	0
J. & M. Patrick	5,289	0	0
J. Outhwaite & Son	5,257	0	0
Treasure & Son	5,228	0	0
C. Cox	5,178	0	0
E. Lawrance & Sons*	5,129	0	0

For partitions in boys and girls' departments, St. Andrew's Street school, Wandsworth Road.

H. Bouneau	£385	0	0
W. Hammond	298	0	0
Lathey Bros.	289	0	0
J. Marsland & Son	275	0	0
W. Martin	250	0	0
T. Hooper & Son	247	0	0
Maxwell Bros., Ltd.	247	0	0
E. B. Tucker	239	0	0
J. Garrett & Son	235	0	0
Galbraith Bros.	230	0	0
General Builders, Ltd.*	227	0	0

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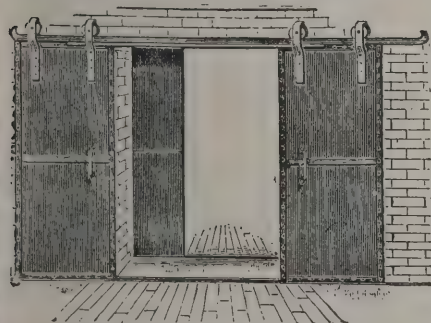
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## LONDON SCHOOL BOARD—continued.

For partitions, &amp;c., in boys and girls' departments, Portman Place school, Mile End Old Town.

F. & F. J. Wood	£1,580	0	0
Bruce, Croom & Co.	1,560	0	0
W. Martin	1,485	0	0
London School Furniture Co.	1,450	4	0
J. Willmott & Sons	1,195	0	0
T. H. Jackson	1,049	0	0
Turnbull & Son *	969	0	0

For senior mixed school, Kingsgate Road site, Hampstead.

C. Dearing & Son	£20,388	0	0
John Grover & Son	20,327	0	0
McCormick & Sons	19,231	0	0
L. H. & R. Roberts	18,828	0	0
Treasure & Son	18,610	0	0
C. Miskin & Sons	18,609	0	0
W. Gregar & Son	18,452	0	0
John Allen & Sons, Ltd.	18,375	0	0
J. Simpson & Son	18,070	0	0
E. Lawrance & Sons *	17,707	0	0

For various centres, Berner Street (site of Old Rice Mills), Whitechapel.

Rice & Son	£8,709	0	0
F. & H. F. Higgs	8,469	0	0
W. Gregar & Son	8,305	0	0
J. Greenwood	8,276	0	0
J. Outhwaite & Son	8,075	0	0
Treasure & Son	7,846	0	0
J. Marsland & Sons	7,715	0	0
E. Lawrance & Sons	7,697	0	0
G. E. Wallis & Sons	7,663	0	0
C. Cox	7,600	0	0
J. & M. Patrick *	6,448	0	0

For converting cookery centre into a housewifery centre, Lower Chapman Street school, St. George's-in-the-East.

D. Gibb & Co.	£359	0	0
A. E. Symes	325	0	0
Vigor & Co.	325	0	0
F. & F. J. Wood	316	0	0
G. Barker *	249	10	0

\* Recommended for acceptance.

## LONDON SCHOOL BOARD—continued.

For drainage and sanitary works, Basnett Road school, Lavender Hill.

J. & M. Patrick	£3,907	0	0
Maxwell Bros., Ltd.	2,868	0	0
Martin, Wells & Co., Ltd.	2,700	0	0
G. Neal	2,528	0	0
Lathey Bros.	2,493	0	0
J. W. Falkner & Sons	2,437	0	0
Stimpson & Co.	2,380	0	0
J. Carmichael	2,369	10	0
R. P. Beattie	2,355	11	5
L. Whitehead & Co., Ltd.	2,325	0	0
E. Triggs	2,316	10	0
J. & C. Bowyer	2,279	0	0
J. Peattie *	2,210	0	0

For partitions in mixed department, Beethoven Street school, Queen's Park.

Lathey Bros.	£965	0	0
W. R. & A. Hide	947	10	0
M. Pearson	754	0	0
The London School Furniture Co.	690	2	6
S. Polden	652	12	0
McCormick & Sons	634	0	0
General Builders, Ltd.	629	0	0
E. Triggs *	596	0	0

\* Recommended for acceptance.

For partitions, Buckingham Terrace school, North Kensington.

London School Furniture Co.	£635	0	0
W. Densham & Sons	421	0	0
W. R. & A. Hide	415	0	0
H. Line	400	0	0
Galbraith Bros.	395	0	0
General Builders, Ltd.	367	0	0
WAKE & DEAN, LTD. (accepted)	348	0	0

For partitions, &amp;c., Ancona Road school, Plumstead.

H. Line	£299	0	0
E. Spencer & Co.	295	0	0
H. Groves	289	0	0
G. Kemp	255	0	0
E. Proctor	250	0	0
E. P. Bulled & Co.	248	0	0
H. BOUNEAU (accepted)	232	0	0

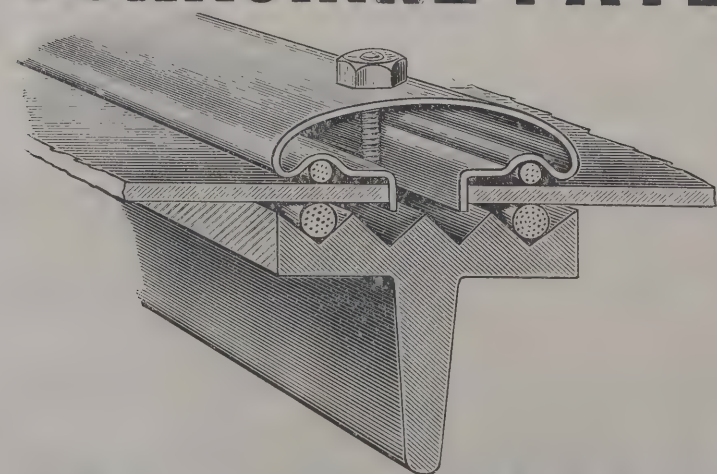
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**LONDON SCHOOL BOARD—continued.**

For heating apparatus, new graded school in Bostall Lane, Plumstead.

R. Clarke	£721	10	0
W. G. Cannon & Sons	717	0	0
B. Harlow & Son	695	0	0
J. Esson	685	0	0
Wippell Bros. & Row	685	0	0
J. & F. May	595	0	0
M. Duffield & Sons	529	0	0
J. Defries & Sons, Ltd.	498	0	0
Brightside Foundry and Engineering Co., Ltd.	479	0	0
DARGUE, GRIFFITHS & CO, LTD. (accepted)	420	0	0

For heating apparatus, Mowlem Street school, Cambridge Heath.

W. Simmons	£58	15	0
W. G. Cannon & Sons	55	0	0
G. & E. Bradley	53	0	0
J. C. Christie	49	0	0
Wenham & Waters, Ltd.	48	10	0
J. & F. May	40	15	0
J. Grundy	40	0	0
M. DUFFIELD & SONS (accepted)	32	0	0

For heating apparatus, Park Walk school, Chelsea.

A. Dougill & Co., Ltd.	£833	18	10
G. Davis	775	0	0
J. Esson	680	0	0
J. Grundy	680	0	0
J. & F. May	585	0	0
J. C. Christie	575	0	0
G. & E. Bradley	535	0	0
M. Duffield & Sons	520	0	0
Werner, Pfeiderer & Perkins, Ltd.	555	2	0
THE BRIGHTSIDE FOUNDRY AND ENGINEERING CO., LTD. (accepted)	475	0	0

**MONK FRYSTON.**

For reflooring, painting and colouring the inside walls of the Monk Fryston National school.

Limbert & Atkinson	£54	0	0
T. G. Wright	48	15	0
W. Thompson	43	0	0
J. Powell	42	10	0
Butler & Sons	42	0	0
W. INGLE, Hambleton, Selby (accepted)	30	10	0

**MILNSBRIDGE.**

For erection of thirteen dwelling-houses in Scar Lane, Milnsbridge, near Huddersfield. Mr. J. BERRY, architect, 3 Market Place, Huddersfield.

*Accepted tenders.*

Taylor & Townend, Golcar, mason.  
 J. H. Saville, Milnsbridge, joiner.  
 G. E. Singleton, Paddock, plumber.  
 G. H. Day, Milnsbridge, plasterer and painter.  
 Pickles Bros., Huddersfield, slater.  
 J. E. Dyson, Huddersfield, concreter.

**SALFORD.**

For erection of St. Matthias's new schools in Blackfriars Road.

Speake Bros.	£8,565	0	0
R. Merton Hughes	7,129	0	0
W. Southern & Sons	6,644	0	0
W. Shaw	6,523	0	0
BURGESS & GALT, Ardwick, Manchester (accepted)	6,528	0	0

**SALTASH.**

For street works in Tavy Road, North Road, Boisdale and Home Park back lanes, Saltash, Cornwall. Mr. W. W. HARVEY, borough surveyor.

W. C. Shaddock	£140	16	6
J. Hosking	137	0	0
JEFFARD & SONS, St. Budeaux, Devonport (accepted)	132	19	6

**SHREWSBURY.**

For erection of a residence, Kingsland (exclusive of plumber and painter). Mr. G. DICKENS-LEWIS, architect, Talbot Chambers, Shrewsbury. Quantities by the Architect.

W. Bowdler & Co.	£1,390	0	0
John Gethin & Co.	1,333	0	0
E. H. Nicholas	1,313	0	0
T. Pace	1,285	0	0
Henry Price	1,284	0	0
R. PRICE & SONS, Shrewsbury (accepted)	1,246	0	0
Geo. H. Bickerton	1,242	0	0
Architect's estimate	1,300	0	0

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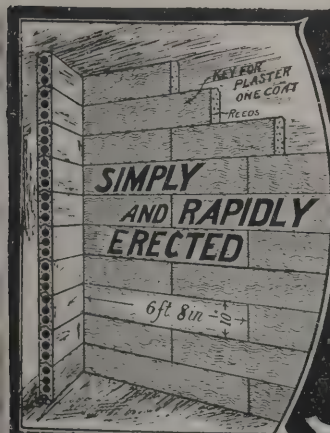
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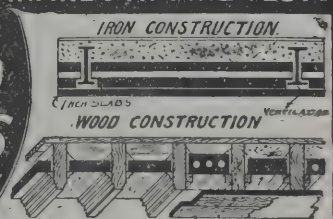
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**SURBITON.**

For private street works at Lovelace Road and part of Lovelace Gardens, Surbiton. Mr. SAMUEL MATHER, surveyor.

S. Kavanagh & Co.	£919	0	0
E. PARRY & Co., Fulham ( <i>accepted</i> )	905	0	0
W. Adamson	835	0	0

**TOOTING GRAVENEY.**

For repairing fourteen Boyd's stoves.

Wontner-Smith, Gray & Co.	£80	10	0
Landers, Ltd.	37	0	0
Cannon & Sons	35	0	0
E. Coules & Sons	34	0	0
J. Bond	31	10	0
Hendry & Pattisson, Ltd.	31	10	0
ROCKHILL BROS. ( <i>accepted</i> )	29	0	0

**TOTTENHAM.**

For street works in Chesterfield Gardens, Cleveland Gardens, Heybourne Road and Rawlinson Terrace. Mr. W. H. PRESCOTT, engineer.

*Accepted tenders.*

E. J. Bloomfield, 156 West Green Road, South Tottenham, Chesterfield Gardens	£1,312	16	3
E. Frost, 27 Steele Road, Tottenham, Heybourne Road	389	8	3
G. W. Rowley, 58 Cranleigh Road, West Green, N., Cleveland Gardens	377	12	0
C. Bloomfield, 16 Summerhill Road, Tottenham, Rawlinson Terrace	158	6	3

**WALES.**

For erection of a memorial chapel at Dolanog. Mr. G. DICKENS-LEWIS, architect, Talbot Chambers, Shrewsbury. Quantities by the Architect.

R. A. Jones	£1,183	0	0
E. C. Phillips	1,083	0	0
E. H. Nicholas	957	12	0
M. J. Harris	945	0	0
W. H. THOMAS, Oswestry ( <i>accepted</i> )	874	19	0
Architect's estimate	850	0	0

For erection of a minister's manse at Pentrefelin. Mr. G. DICKENS-LEWIS, architect, Talbot Chambers, Shrewsbury.

R. A. JONES, Llanfyllin ( <i>accepted</i> )	£363	0	0
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**WALES—continued.**

For construction of a reservoir embankment and other works connected therewith at Ysceifiog, near Mold. Mr. T. B. FARRINGTON, engineer, Trinity Square, Llandudno.

T. Rowlands	£2,247	16	9
J. J. Blackburn	2,128	5	0
H. Roberts	1,902	10	0
Jones & Son	1,756	7	6
R. D. Hughes & Co.	1,409	19	3
Roberts & Ellis	1,390	0	0
Rowell & Sons	1,370	15	5
Cruwys & Hobrough	1,272	1	4
J. Downham	1,228	3	0
HUGHES & ROWLANDS, Colwyn Bay ( <i>accepted</i> )	988	5	0

For supply of cast-iron socket pipes, together with all irregulars and special castings that may be required for twelve months ending June 30, 1903. Mr. C. H. PRIESTLEY, waterworks engineer.

Stanton Ironworks Co., Ltd.	£6,541	0	0
D. Y. Stewart & Co.	6,531	18	6
D. M. Stevenson & Co.	6,487	3	9
Macfarlane, Strang & Co., Ltd.	6,342	15	6
J. & S. Roberts, Ltd.	5,956	0	0
COCHRANE & Co., Dudley ( <i>accepted</i> )	5,774	7	6

**WORTHING.**

For erection of a circular brick chimney-shaft at the electric generating station, High Street, Worthing.

A. Vve-Parminster	£1,560	0	0
A. Vve-Parminster	1,440	0	0
W. Gilbert	1,411	12	6
Universal Engineering Co.	1,285	0	0
A. Vve-Parminster	1,240	0	0
A. Vve-Parminster	1,120	0	0
Universal Engineering Co.	1,075	0	0
Neile & Co.	1,050	0	0
Alphons Custodis Chimney Construction Co.	1,000	0	0
W. A. Field & Co.	950	0	0
D. Lee	860	0	0
Wilson Bros. & Lamplough	825	0	0
Smith Bros	695	0	0
London Boiler & Setting Co.	690	0	0
J. Pennington	680	0	0
MYLES & WARNER, Stalybridge ( <i>accepted</i> )	679	0	0

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## ILLUSTRATIONS.

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DRAWING-ROOM.

THE PRINCE BLUCHER, STAFFORD STREET, WALSALL.

THE HOPE INN, LEEDS.

*Received too late for Classification.*

### PETERBOROUGH.

For erection of an extension of the infirmary to be known as the Coronation Wing. Messrs. TOWNSEND & FORDHAM, architects.

Cracknell . . . . .	£3,047	0	0
Hammond . . . . .	2,976	0	0
Furnis . . . . .	2,698	0	0
Thompson & Son* . . . . .	2,662	0	0

\* Accepted with the following additions:—For heating apparatus, £80; for slabs on the frontage, £18, bringing the total outlay up to £2,760, making in all with the architects' fees of £140, a total of £2,900.

### SKINNINGGROVE.

For erection of a schoolroom and classrooms, &c., in connection with the Wesleyan chapel, Skinninggrove, Yorks. Mr. A. FARNDAL, architect, Kilton Lodge, Brotton, R.S.O.

E. Cruddas & Son . . . . .	£490	0	0
J. & R. Ridsdale . . . . .	450	0	0

### TRADE NOTES.

THE Isolation Hospital, Ilfracombe, is being warmed and ventilated by means of Shorland's patent Manchester stoves with descending smoke flues.

A LARGE clock with four 7-foot dials and striking the hours has just been erected in the new tower of the Royal Orphanage, Wolverhampton, by John Smith & Sons, Midland Clock Works, Derby.

THE Corporation of Newcastle-on-Tyne have given instructions to Messrs. Wm. Potts & Son, clock manufacturers, Town Hall Buildings, Newcastle and Leeds, to erect a clock with large external dial at the Westgate Mission church, Newcastle, which is now in hand. They have also just completed a new hour striking clock at Crakehall Church, near Bedale, to commemorate the Coronation of King Edward VII.

### ELECTRIC NOTES.

THE results of the second year's working of the electric-light undertaking of the York Corporation show a total revenue of 6,110*l*, as against a total revenue last year of 3,802*l*. The total cost of generation and management has been 3,518*l*, as against 2,276*l*, being an increase of 1,241*l*, and the gross profit is 2,591*l*, as against 1,526*l*. Interest and sinking fund this year absorb 2,242*l*, leaving a net profit of 349*l*, as against 98*l* last year.

At a meeting of the lighting committee of the Liverpool Corporation a communication from the Board of Trade was read stating that Mr. A. P. Trotter, one of their inspectors, had been directed to confer with various civil and electrical engineers with a view to revising regulations made under the electric-lighting Acts, which affect both tramways and lighting. The committee authorised Mr. Holmes, Corporation electrical engineer, to attend the conference.

### BUILDING AND BUILDERS.

MEMORIAL-STONES of a new Primitive Methodist church at Beckbridge, Normanton, were laid on the 30th ult. The building will cost 1,100*l*, and accommodate 300 persons.

THE foundation-stone has been laid of a new Wesleyan Sunday school at Whaplode, near Spalding. The building will form part of an extension scheme which will involve an outlay of 2,500*l*, and which will also include new chapels at Donington and Moulton Chapel and a manse at Spalding.

# WILSON'S PATENT "MULTILUX" WINDOWS



The above illustrates an office where the light coming from the sky falls on to the floor and is absorbed, thus leaving the back part of the room dark. The illustration below shows the same room with WILSON'S PATENT MULTILUX WINDOW fixed. This refracts the rays of light and throws them horizontally, thus preventing them falling on to the floor, and lighting up the whole room.



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Pavement Lights are  
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AT a special meeting of the Birkenhead School Board a recommendation of the sites and building committee that the plans for the enlargement of the Laird Street school, including provision for cookery, laundry and manual instruction and a caretaker's house, be adopted were confirmed.

MEMORIAL-STONES of a new Wesleyan church at Romiley, near Stockport, have been laid. The site is the ground formerly occupied by the old fire-damaged chapel. The new building is estimated to cost about 2,860*l.*, and seat, with gallery, some 500 persons.

THE old Newington vestry hall, which, since the creation of the new borough of Southwark, has been used as town hall for the enlarged municipality, is to be further extended at a cost of 14,000*l.* The extension has been occasioned in consequence of the greatly augmented staff of clerks and officials which the Borough Council has introduced into the old building.

THE corner-stone of new offices for the Horbury (Yorks) Urban District Council was laid on the 30th ult. by Mr. Joshua Harrop, the chairman. The offices, including the site, &c., will cost about 6,000*l.* Mr. Harrop afterwards entertained a large number of ladies and gentlemen at a garden party, and was presented with a gold Coronation medal by his colleagues.

ON Saturday last an accident occurred at Burnfoot Bridge, about three miles above Langholm, N.B. The bridge, which is a handsome structure, is at present being reconstructed and strengthened by Sir Frederick Johnstone, Bart., of Wester Hall, and Mr. Malcolm, of Burnfoot, to whom it belongs. It crosses the river Esk near Burnfoot. An extra arch has been put in, and five centres or supports have been used, and it was while these were being removed that the accident occurred. Each centre was very massive, requiring 16 men to lift it, and weighing fully a ton. The two outside supports had been safely removed, but on taking steps to remove a third the other two came down suddenly on a platform on which six men were standing. Three of them managed to clear themselves, but the other three were struck and knocked over. Wm. Beattie was cut on the head and had his right arm broken; D. Moffat, cut about the head and injured in the back; and Jas. Kyle had his arm cut and bruised. They were conveyed to their homes in Langholm, where they received medical aid.

THE foundation-stone of the new church of St. Matthew, Renishaw, was formally laid by Dr. King, the Lord Bishop of Lincoln, on the 24th ult. The church, the contract for which has been let to Mr. James Fidler, Eckington, is estimated to

cost about 4,300*l.* The new edifice will be in the Early English style of architecture, and will be constructed to designs prepared by Messrs. Naylor & Sale, architects, Derby. Externally the church will, when completed, present an attractive appearance and be a distinct addition to the architectural features of the district. At present, however, it is only proposed to proceed with the erection of the nave, the north aisle, the base of the tower, which will be utilised as an organ-chamber, and a vestry, leaving the chancel and the completion of the tower over for future consideration. The external walls will be built with Stoke Hall stone, from Grindleford, with Cox bench-dressing inside. It will be covered with green slates and oak and timbered roof. The lighting will be by gas and the heating by hot water. Accommodation will be provided for about 400 worshippers, and it is hoped it will be ready for opening by March next.

### VARIETIES.

A NEW Roman Catholic church was opened at Astley Bridge, Bolton, on the 27th ult.

THE newly-erected chapel and Sunday school for the Primitive Methodists at Knaresborough have been completed. The premises occupy a position on the north-east side of Pump Hill, with a frontage to High Street. They are of stone, very ornamental in appearance, the cost of their erection being upwards of 3,000*l.*

A MEETING of the registration committee of the local branch of the National Registration of Plumbers was held last week at the offices, Lord Street, Liverpool, Dr. Vacher, county medical officer of health for Cheshire, presiding. A number of registration certificates were distributed to plumbers, who attended from Oswestry, St. Helens, Liverpool, Southport, Waterloo, &c. A number of other applications were deliberated upon, as well as the financial statement of the movement, from which it appeared that the Plumbers' Company had already spent a sum of 31,821*l.* in excess of receipts on the movement since its inauguration in 1884.

THE new church of St. Columba, Middlesbrough, was consecrated on the 19th ult. The edifice is the design of Mr. T. Moore, of Hampstead, and, owing to the peculiar shape of the site, it is a remarkable structure. The style is a *mélange* of Early English, Gothic and Italian. The nave consists of a

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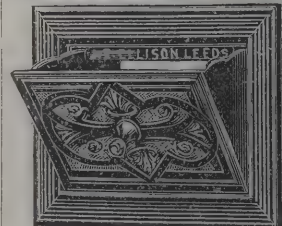
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double arcade of three bays, being 88 feet long and 32 feet wide, and is covered with three immense vaults of simple Early English type, boarded throughout and finished with French grey moulded ribs, springing from pilasters on the massive piers. The carved bosses at the intersection of the ribs are gilded and coloured, being some 60 feet from the floor. The east end terminates in three lofty arches, opening into the chapel beyond, there being no chancel. Over these is an ambulatory, and above this again a group of five lancet windows deeply recessed, like all the rest. The altar is raised on seven steps in groups reaching up to the platform. The choir is retained within dwarf walls advancing into the nave, and raised above it by two steps. Beyond the pierced east wall is the small chapel for daily prayers. This has three lofty arches springing from two very slender octagonal stone pillars. It has four lancet windows on the south side and a row of small ones filled with stained glass high up at the east end. On the north side is the vestry. The edifice will be entirely lighted by electricity. The tower, which is 72 feet high, has various lancet windows, with a row of round ones under the parapet, the whole being surmounted with a high-pitched roof bearing a simple cross. The cost has been £8,800, including £1,700 for the site.

THE church of St. Mary, Far Cotton, Northampton (one of the several churches erected under the Northampton Church extension scheme originated by the late Archbishop Magee, when Bishop of Peterborough), the foundation-stone of which was laid in May 1884, and which was consecrated in October 1886, has since that time been awaiting the erection of tower and spire, to bring it into a state of completion. Some eighteen months ago the amount subscribed towards this object was sufficient to guarantee the work being proceeded with, and Mr. M. H. Holding, the architect of the church, was consulted as to the preparation of plans; and these were ultimately agreed upon. The estimated cost was about £1,200. The contract for the work was entrusted to Messrs. J. Pullen & Sons, Bridge Street. The tower, which rises to a height of about 70 feet, is of Dunston stone with Bath stone dressings and cinquefoil windows in the lower stage. Tall double lancet windows are also placed in the belfry stage. The spire, springing from the tower, is built wholly of Bath stone, and is 58 feet in height, making a total of 128 feet. At the top of the spire is an octagonal finial, and this is surmounted by a decorated rod and vane, measuring between 7 and 8 feet. The

vane is the conventional gilt cock, and running thence down the edifice a lightning conductor, going down some 12 feet into the earth, will be fixed. The finishing touch to the work was completed on Monday by the fixing of the vane on the rod which had been prepared to receive it.

H.I.M. THE GERMAN EMPEROR (according to the German *Imperial Gazette* of July 23), has graciously accorded the distinction of the Red Cross (third class) upon Mr. Edwin O. Sachs, chairman of the British Fire Prevention Committee; Major Fox, chief officer of the London Salvage Corps; Second Officer Gamble, Metropolitan Fire Brigade; and Mr. Horace Folker, hon. secretary of the National Fire Brigades Union. Similar distinctions for merit in fire-preventive and fire-brigade work have been accorded to the following foreign members of the British Fire Prevention Committee, *i.e.*, to Count Kamorowski (chairman) and M. Henry (hon. secretary), of the International Fire Council; to Messrs. Czermack and G. de Marie (presidents of the Austrian and Luxembourg Fire Federations respectively); and to Chief Officers Westphalen (Hamburg), Dittmann (Bremen), Count Fernandez (Oporto), J. Meier (Amsterdam), Colonel Goldoni (Milan), Chevalier Pappini (Florence), and Lieutenant-Colonel Meyer (Copenhagen).

THE annual conference of the Auctioneers' Institute of the United Kingdom will be held in Belfast on September 4, 5 and 6. In 1899 the conference was held in Dublin and the coming visit will be the first since then. One of the objects which the Institute has in view is the securing of a Royal Charter, and if this year's meeting is as successful as is anticipated, and meets with the support which it is hoped it will, the movement will have received a great impetus. On the opening day the Council of the Institute will be entertained at a banquet given by the local auctioneers, and on the remaining days the visitors will be shown the principal industries and places of interest in Belfast, a trip to the Giant's Causeway concluding the arrangements for the occasion. An efficient and capable committee of city auctioneers has been appointed, of which Mr. Robert M. Gray and Mr. H. H. Montgomery are the hon. secretaries. Nothing has been left undone in regard to either the business or social arrangements to make the conference a thorough success, and it is to be hoped the auctioneers of Ulster will avail themselves of the opportunity of conferring with their brethren from England and Scotland on matters which intimately concern the best interests of the profession.

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Telegrams, "Union St. Helens." Nat. Tr. 1. 48.

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ARRANGEMENTS have been made for the Twenty-fourth Annual Ecclesiastical, Educational and Art Exhibition to be held in the Exhibition Buildings in Gold Street, Northampton, which are admirably situated for the purpose, being close to the Congress Hall. It will be open on Saturday, Oct. 4, remaining open till Friday, Oct. 10. The exhibition will be thoroughly representative of the ecclesiastical and educational furnishing trades and manufactures throughout the country, and the clergy and churchmen generally are being invited to contribute towards the loan collection, which promises to be of very great interest, several well-known collectors having kindly promised their support. The Church societies and institutions, for whom during the Congress the exhibition always forms a convenient rendezvous to meet their friends and supporters, will again be mustered in full force. The exhibits will as usual comprise metalwork, embroidery, wood and stone carvings and "articles of every description used in the services of the Church, and in the fitting, lighting, warming, ventilating and the decoration and embellishment of churches, including stained-glass windows." Space will also be provided for Church literature of all kinds, Bibles, Prayer-books, &c., and a special feature is always made of educational works and appliances. Offers of loans of Church plate, embroidery, wood and ivory carvings, paintings, old MSS. and books and articles of archaeological interest generally, should be addressed to the manager, Mr. John Hart, Maltravers House, Arundel Street, Strand, London, W.C.

### NEW THAMES TUNNEL.

THE new tunnel for pedestrians, constructed for the London County Council by Messrs. J. Cochrane & Sons at a cost of 120,000*l.*, will be opened for free public use on August Bank Holiday. For the two days previously it will be handed over to the Seamen's (Dreadnought) Hospital and the Poplar Hospital for Accidents, which will make a small charge for admission. The work has taken three years to carry out, the actual tunnelling under the river being done in eight months. At first the County Council thought to make a tunnel slightly smaller than the one at Blackwall, to carry vehicles as well as passengers, but this project was soon dropped as the Millwall docks, on the Isle of Dogs, made it impossible to construct the necessary approaches. There was little traffic, and communication

between the two banks was needed wholly in the interests of the working people of both districts. The approach on the Greenwich side is from the north end of Church Street, in the rear of the famous Ship tavern, and on the Millwall side by a footpath 15 feet wide at the western end of Island Gardens. A ferry between Greenwich and the Isle of Dogs has about 1,300,000 passengers a year. The tunnel, which is 60 feet below high-water level, is 1,217 feet long and 11 feet in diameter. It has been driven by a shield working under compressed air from the north side, and the entrance at each end is by a circular shaft 35 feet in diameter, with stairways and electric lifts. The top of the tunnel is 13 feet from the bottom of the river.

### THE QUEEN VICTORIA STREET FIRE.

THE following questions were proposed to the jury on the victims of the fire on June 9, and the following answers were returned:—

What was the cause of death?—Suffocation, burns, shock and injury, in accordance with the medical evidence.

What was the time of the fire, and where did it first break out?—Between two and three minutes to 5 o'clock, on the second floor of No. 67.

Did the private fire brigade of the General Electric Company materially contribute to the extinguishing of the fire?—No.

Were reasonable precautions taken against fire by the General Electric Company, having in view the number of electric lighting lamps and wires in use and the amount of inflammable material about the premises?—We say No.

Whether the deaths under inquiry were not due to the shortness of the fire-escape sent from Watling Street station?—Partly.

Whether Watling Street station should not have been provided with a ladder sufficiently long to reach the fourth floor window of No. 67 Queen Victoria Street?—Yes.

Whether a 60-foot ladder could not have been kept equally well in place of the one stationed near the church in the street facing Watling Street station?—Yes.

Whether a tall ladder—say, of 60 feet—should not be taken in the first place to all fires?—We are of opinion that this question be left to the discretion of the Fire Brigade officials.

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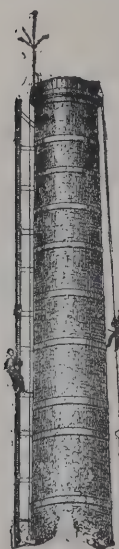
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Whether Watling Street station should not have been able to send an escape long enough to reach a window-sill 55 feet high?—Yes.

Was the call at Watling Street reasonably early? In other words, did the lateness of the call contribute to this lamentable loss of life?—The call was a very late one, and in our opinion contributed to the lamentable loss of life.

Was the jumping-sheet of the Metropolitan Fire Brigade actually used to catch any person who jumped from the window?—No.

Would the lives of some or all of the girls have been saved had the Watling Street escape been able to reach the fourth floor window of No. 67 Queen Victoria Street on its arrival at the fire at 5.14 P.M.?—Some might have been saved.

Are the reasons given by Captain Wells as to the four cars' delay in converting Watling Street into a first-class station satisfactory?—No.

Had Watling Street station been adequately equipped to save any lives have been lost?—We cannot tell.

Is it desirable to allow automatic fire-alarms to be in direct communication with the fire-stations in the manner approved by Sir Eyre Massey Shaw?—This is a question for the London County Council authorities to decide.

Does the City get all it has a right to expect from its Fire Brigade?—It is an impossible question for us to answer.

Do you think that the premises of the General Electric Company, Nos. 67, 69 and 71 Queen Victoria Street, constitute a workshop within the definition of the Act?—We say yes, most decidedly.

Do you think that had proper structural exits been provided on the roof or elsewhere this loss of life would have been altogether or partly prevented?—We say yes, altogether prevented.

Was the sanction given by the district surveyor, Mr. Power, for the structural changes that connected 67 to 69 in your opinion legal or otherwise, in view of the fact that the General Electric Company's occupation of No. 67 was only partial?—We say illegal.

Was there any neglect of legal or other obligations or duties on the part of the following:—(1) The General Electric Company; (2) the Metropolitan Fire Brigade; (3) any of the various officials who have given evidence; (4) any of the various authorities alluded to in the course of evidence; if any negligence has been committed, to what degree does that negligence, in your opinion, amount?—We say, with regard to

the General Electric Company there was gross legal negligence, but not criminal. With regard to the Fire Brigade, "No, considering the appliances at their disposal." (3) We say "Yes;" we consider the factory inspector failed to properly represent to the Home Office the nature of the work carried on by the General Electric Company through not making sufficient inquiry. We think the district surveyor is to blame for his interpretation of the term "wholly occupied."

Do you consider the entrance to No. 71 sufficient for the employees at 67, 69, and 71?—We say "No, it is not sufficient."

The foreman said the jury thought the cause of the fire unknown, and as to who was responsible the jury could not say. They wished, however, to add the following riders:—

(1) We consider that the Watling Street station is totally inadequate to meet the demands of the district in which it is situated, and that it should be immediately reconstructed a first-class fire station. (2) We consider that the London Building Act, 1894, should be made retrospective as regards life-saving. (3) We consider that the General Electric Company, by evading the Factory Act and misleading the district surveyor, render themselves responsible for the loss of life. (4) We give unqualified praise to the Metropolitan Fire Brigade and the Salvage Corps, and we consider that, as usual, the City police did their duty exceedingly well.

The jury added their deepest sympathy with the parents and relatives of the deceased.

### A NEW PUMP.

At the Ilford District Council electric power station experiments have been made with a new air-lift pump, the invention of Mr. Joseph Price, of the firm of Legrand & Sutcliff, and the results show that a revolution has been worked in the method of raising water from deep wells, and that in all probability the knell has been sounded of the expansion deep-well pump.

By this system a great economy is effected, as it only requires one horse-power to operate any number of wells. The new air-lift pump designed by Mr. Price brings about a considerable saving of the waste of power inherent in the design of the ordinary air-lift pump. In this pump the rising main being of equal diameter throughout its length, the water and air rise in alternate layers. The action of the air as it rises in the main can be best understood by taking an

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illustration. Suppose the height to which the water must be raised is 80 feet, and the immersion of the tube is 120 feet, thus making a total length of rising main of 200 feet. The air is pumped down the rising main through a small tube at a pressure which in this case would be 60 lbs. At this pressure it will occupy about one-fifth of its original volume. This air gets blown out at the bottom of the inner air pipe amongst the water of the rising main, and as it lightens the water and rises the pressure above it will become less and less, and at the top of the well will only have the atmospheric pressure above it. If it can it will expand gradually on its way upwards, until at the top it will occupy a length of the tube several times what it was at the bottom. In order to allow of this expansion the water above the layer of air must have been caused to travel very much faster than it did at the bottom. That is to say, much of the energy of the air has been uselessly employed, giving a rapid motion to the water in the upper parts of the tube.

In order to get over this difficulty Mr. Price has introduced a tapering rising main, so that it is wider at the top. In this tube the air expands laterally, and the layers of water travel with about the same speed at the top as they do at the bottom of the rising main, and there is thus no waste of energy in creating momentum in the water. In the Ilford well the immersion is  $1\frac{1}{2}$  to 1 of lift, the lift being 130 feet. The air pipe down the centre of the rising main is  $1\frac{1}{2}$  in. diameter at the top and  $1\frac{1}{4}$  in. lower down. The air is supplied by an Alley and McLellan compressor, which on trial gave the following results:—When the air pressure in the receiver was 80 lbs. the mean indicated horse-power of the air in the cylinder was 18.83; when 100 lbs., 22 i.h.p., and when 120 lbs. it was 24.3 i.h.p. On trial with one of these air compressors directly driven with a steam-engine the loss was only 6 per cent. At Ilford the compressor is driven with a motor.

The efficiency of the system may be compared with that of the deep-well pump, as there are records of the latter. If 10 per cent. be allowed as the loss between the steam-engine and the compressor, and 20.5 i.h.p. the mean of the air in the cylinders, a comparison may be made. The supply of water is 12,000 gallons an hour, the lift 130 feet and the pressure of air 90 lbs. With these figures the efficiency works out at 35 per cent, even for the first installations. The efficiency of the deep-well pump after working some time comes down to some 40 per cent. So when the cost of repairs, maintenance and small comparative supply of water

of the deep-well pump and the number of air-lift pumps and the large supply of water from each are compared, the result stands very strongly in favour of the new air-lift pump. Compared with the ordinary air-lift pump with straight, rising main, it will be seen that the results are 40 per cent. higher. The pump should prove of considerable advantage to the requiring water to be raised from deep wells in the Colonies as well as in this country. In Australia, for example, the wells are mostly of the artesian type, and in many of them the water rises of its own force to the surface, being what are known as gushers; but the air supply in the arrangement described above would have the effect of increasing the supply per horse power. In mining districts where there is already a steam plant extra fittings for the air supply to provide water would be very small, and economy would be obtained in a lessened expenditure in original cost. It should have a great vogue in electric power stations.

### ST. PETER'S CHURCH, BIRMINGHAM.

THE new church of St. Peter, which has been erected in George Street West, at its junction with Spring Hill, was consecrated by the Bishop of Worcester on the 19th ult. It is one of the largest and most important of the new churches of Birmingham, and will form the centre of a new ecclesiastical parish taken out of the districts of All Saints, Hockley, and St. Martin. It has been built in accordance with the provisions of the Birmingham Churches Act to replace the old church of St. Peter in Dale End. The cost of the site and of the building has been paid out of the fund created under that Act, and the Rev. W. H. Parker is the first vicar of the new church. The building has been erected from the designs of Mr. Frank Barlow Osborn, architect. The style is Early Perpendicular, and the materials used red brick internally and externally, with Hinton stone arcades, windows and dressings, and the roofs are covered with tiles. The church depends for its effect chiefly upon its proportions, stability and spacious interior without much expensive ornament. The west end faces George Street West, with a gabled baptistery projecting from the end of the nave, from which it is approached by an archway. On each side of the baptistery are porches leading into the nave, also with gabled roofs. At the west end of the south aisle is the tower, which rises 97 feet from the level of the footpath. The length of the nave is 95 feet.

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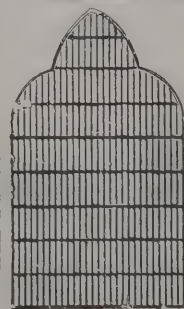
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ches, the chancel 38 feet 6 inches, and with the baptistery total internal length of the church 145 feet. The width of nave and aisles is 54 feet, and across the transepts 68 feet, a transept having a separate entrance. There is a chancel on the south side, and choir and clergy vestries with a chamber over, on the north side. Accommodation is provided for 800, and the whole of the seats are of oak. The chancel is lighted by a great number of traceried windows, including very large ones at the east and west ends. The roof is a fine open timbered one, showing the construction. The church from old St. Peter's Church has been remodelled and fixed to the baptistery. The old bell from the same church has been cast and enlarged, now weighing 1 ton 2 cwt., and has been hung in the tower by Messrs. Barwell & Sons. The old organ of St. Peter's has been enlarged and practically rebuilt by Messrs. Norman & Beard, of Norwich. Part of the old organ from old Christ Church has been refixed in the north transept, and both the organ cases in the chancel have been constructed from the architect's design out of the old mahogany of Christ Church, which is of beautiful colour and quality. The stained-glass window which has cost 340*l.* has been placed in the east window of the chancel. The chancel is paved with Italian marble mosaic. The choir stalls are of oak, simple and rich in design. The oak altar-rail and pulpit, of special design and richly carved, have been made by the contractors for the whole of the work, Messrs. W. Sappcote & Sons, 17 Camden Street, Birmingham. The church has been fitted with electric light by Messrs. Walker Bros., of the Old Square, in such a way that the glare of the light is not in the eyes of the congregation. The carving has been well executed by Mr. Thomas Catley, of Kennington, and includes a very fine life-size figure of St. Peter in the west transept, the heads of King Edward VII. and Queen Alexandra on each side of the west window, and also that of Her Majesty late Queen Victoria in the gable of the baptistery, as the church was commenced in her reign. Internally, on either side of the chancel arch, there is carved the head of a bishop, and the carving on the font is very effective. The cost of the church, exclusive of the organ and site, will be between 10,000*l.* and 14,000*l.* The leaded glasswork has been done by Messrs. Camm & Co., Smethwick, and Messrs. Haden, of Walsbridge, have carried out the heating on a system of compressed hot air and hot water. The ornaments have been supplied by Messrs. Hart, Peard & Co. The altar cross, presented by the parishioners, is in

the style of the Early Decorated period. The processional cross (presented by Mr. G. Herbert Lloyd) is of polished brass on ebony shaft. The type is that employed in the old Breton churches, whereof a fine example is shown in the Louvre. The eagle surmounting the lectern is of very noticeable design, being a copy in brass of the celebrated one in Worcester College, Oxford, carved by Grinling Gibbons. The sanctuary chairs are in oak of the kind usually known as "Glastonbury."

### SOUTHAMPTON IMPROVEMENTS.

A VERY interesting visit was made by the members and Associates of the Society of Engineers on Wednesday, July 16, to the works of the new graving dock and the widening of the Old Extension Quay at Southampton, and afterwards to the Southampton Corporation Waterworks at Otterbourne.

#### *The New Graving Dock.*

The graving dock now being constructed for the London and South-Western Railway Company at Southampton will be the largest of six dry docks belonging to the company, all of which are in constant use. About eight years ago a somewhat smaller dock (but at that time the largest in the world) was opened by His Majesty the King (then Prince of Wales). Since that time the size and number of vessels frequenting the port of Southampton has been steadily increasing, and it has become necessary to provide more dry-dock accommodation for vessels of the largest class. Accordingly, towards the end of 1899 the directors of the railway company instructed their consulting engineer, Mr. W. R. Galbraith, M.Inst.C.E., to prepare designs for the present work, the contract for which was let to Messrs. John Aird & Co. early in 1901.

The dock will be approached by vessels directly from the estuary of the river Test, which forms one boundary of the dock estate. The river channel is being deepened by dredging to form an ample approach to it. The dock itself will be 860 feet long (clear inside gates), with provision for extension if necessary; 90 feet wide at entrance, with the same bottom width inside, and 125 feet wide at cope level. The whole depth from cope to floor will be 43 feet, giving a depth of water over the keel blocks of from 29 feet 6 inches neap tides to 33 feet spring tides at high water. It is built almost entirely of Portland cement concrete, the floor, altars and walls being faced with this material. The bulk of it is made in the pro-

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portion of 8 to 1, the facing to walls and floor, together with the culvert linings, being somewhat stronger, generally 4 to 1. A skin of 4 to 1 concrete is also laid on the underside of the floor, and carried up the back of the walls, so as to prevent any water which may accumulate there from soaking through the more porous concrete into the dock. This 4 to 1 concrete is made with special care, the large stones in the gravel being reduced in a crusher. A mass of 5 to 1 concrete is built in at the skewback, where the walls and floor meet, to resist the heavy crushing stress at that point.

The altars, seven in number, are all grouped near the top. They are 2 feet 6 inches wide and only 2 feet 9 inches high, and thus very safe and convenient to work on. Access to the floor is given by eight flights of steps, and four slides for timbers are provided.

The entrance-gates, which will have a span of 90 feet and a rise of 16 feet 9 inches, will be of steel, and will be worked by direct-acting hydraulic rams. The hollow quoins and cill quoins will be of granite from the Shap Quarries in Westmoreland. The steps and timber slides will also be faced with this stone.

For emptying the dock the water will fall into large pits near the entrance. From these three large culverts will lead it to the pump wells, placed at some little distance behind the eastern wall, and at a depth of 10 feet below the dock floor. Over these the pump-house will be built, and will contain two 48-inch centrifugal pumps, capable of emptying the 85,000 tons of water in the dock in a little over two hours. Space will be provided for a third pump in case the dock should be lengthened. The boiler-house will be built alongside the pump-house.

The site of the dock originally formed part of the extensive mudlands on the river Test shore, which were covered by every high tide. To reclaim the site a bank was tipped round it with chalk taken from the railway company's cutting at Micheldever. While tipping this bank a dredger was at work within removing the top mud, which was very soft and foul. The sea face of the reclaiming bank was pitched with stone to preserve it from storms, and covered with clay to render it water-tight. The latter process was a very troublesome one, owing to the difficulty of finding suitable clay. A supporting toe of 3-inch sheet piling was provided in places where necessary. As soon as the bank was sufficiently sealed to keep out the tidal water the enclosure was dried out with a 9-inch centrifugal pump and engine, erected just inside the bank.

Meanwhile a 1 in 12 incline road, with a winding engine had been built at the bow end of the dock, and as soon as the site was dried excavation by hand gangs, by steam crane and by steam navvy was commenced, the earth waggons being hauled up the incline and emptied on to other mudlands on the dock estate. The surface was thus lowered to a depth of from 26 feet to 30 feet below cope, at which level it was decided the timbered trenches should be commenced, in which the dock walls should be built.

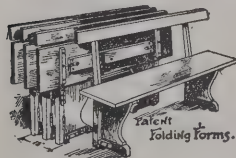
At the entrance end the chalk enclosing bank approached very near the dock, and protection was given to it by driving a complete belt or dam of 12 inch sheet piling across the entrance, which in its turn is supported by raking struts. Inside this again a cross trench was sunk, so as to build the first 20 feet of dock floor, which now forms a massive toe for the timbering. The arrangement of this timbering is worthy of notice. The wall trenches are now being sunk and timbered in a substantial manner, and directly a length is sunk to its full depth the concrete wall is started inside it. When these walls are completed the dumping between them will be excavated in similar fashion and the concrete floor built in length by length. The excavation for the pump wells, &c., is being similarly dealt with, the trench being heavily piled to avoid all risk of displacement. Any water which finds its way into the enclosed area is led by pipes and grips to one or other of two pumps, which are provided to keep the works dry.

#### Old Extension Quay Widening.

The Old Extension Quay was built in 1875, and has been used principally by the large vessels of the Union-Castle Line. It is a tidal quay, well equipped with hydraulic cranes and good cargo sheds, and having a minimum depth of water of 20 feet at L.W.O.S.T. This depth, though at the time of its construction considered very ample, has of late years become quite insufficient to accommodate the large mail boats of this fleet. As the quay is close to the repairing factory and stores of the Union Castle Co., and so very convenient to them, it was thought better to deepen it rather than to construct another quay elsewhere. To effect this it was resolved to dredge to the required depth (30 feet below low water), at a distance of 50 feet from the existing wall, and to cover the intervening space with a platform, which would serve to widen the existing quay to deep water, so that vessels could still lie close alongside.

The design of this platform was the next problem. Its

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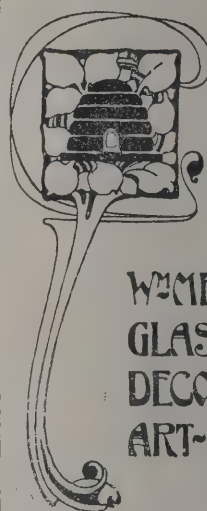
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and that timber is very soon destroyed in Southampton water by the ravages of the wood shrimp, which in a few years is a large timber through. Accordingly it was decided to build the platform of ferro-concrete on the Hennebique system. Piles of this material are built up in vertical moulds, in which are placed the long steel rods which really give the required length. These are laced together with wire stirrups, and Portland cement concrete of excellent quality is carefully put into the moulds and rammed round the steel. After a month the pile is taken out of its mould and conveyed to the quay, where it is driven in position much like a timber pile would be. The ram is exceptionally heavy, however (30 cwt. generally). The head of the pile, too, is protected from being bruised by covering it with a helmet or iron case filled with sawdust. Moreover, a timber dolly is always used. The whole process is novel and interesting.

The work is being carried out in three lengths so as to interrupt traffic as little as possible. Over the first length a temporary timber stage has been erected, on which two large four pile-driving engines for the permanent work have been placed. Each engine is provided with an 8-ton steam winch by which to pitch the piles and to lift the ram and other gear to position.

In the present work it was found impossible to drive the piles down to the required depth, especially in the front row, where they had to go 22 feet into the ground through gravel and hard sand. To overcome this difficulty the water-jet system of sinking was introduced. As beds of gravel and clay occurred it was impossible to sink with the water jet alone. Accordingly arrangements were made to drive and pump simultaneously. The water is fed down a  $\frac{3}{4}$ -inch pipe buried in the centre of the pile and ending in a  $\frac{3}{8}$ -inch nozzle at the point of the shoe. It is supplied from the hydraulic pressure mains, containing water at 750 lbs. per square inch. This pressure is reduced by throttling to about 300 lbs. per square inch for this work. The result has been entirely successful, and the piles are driven to their depth in less than an hour. Progress is retarded, however, by the fact that the piles and their guide timbers can only be fixed at low tide.

When the piles have been driven the concrete round the pile is to be stripped off, and the steel rods for the various beams and struts laid in position. Each set of rods is laced with wire or hoop steel, and surrounded with a timber casing. To this casing concrete is poured and rammed, and each beam or strut thus built up *in situ*. A flooring of rolled joists

and timber decking is laid on top of all. This will contain rails for the trucks and for the hydraulic cranes.

The engineer for the new dock works is Mr. W. R. Galbraith, M.Inst.C.E., and the resident engineer is Mr. F. E. Wentworth-Sheilds, Assoc.M.Inst.C.E., who has kindly supplied the foregoing particulars of the works. The contractors for the works are Messrs John Aird & Co., who are represented by Mr. J. W. Landrey.

#### Southampton Corporation Waterworks, 1290-1902.

The waterworks of Southampton have a history going back to a more remote date than can probably be ascribed to any other such undertaking in this country, it being recorded that on June 16, 1290 (Edward I.), one Nicholas de Shirlee granted to the Friars Minor the right to take water from a spring at Colwell (now called Spring Hill, Hill Lane) to Achard's Bridge, and thence by the king's highway to their church in the town of Southampton. It is further recorded that upon the Feast of the Purification, 1310 (Edward II.), the friars granted the use of the water to the town. On October 3, 1420 (Henry V.), they conveyed to the mayor and community of Southampton all their rights and title in the springs, conduit and pipes, and the waterworks of the town have ever since, for a period of 482 years, remained in their possession.

The original vaulted chambers covering the Colwell spring and one of the old water-houses (adjoining St. Peter's Church), to which the water flowed, may yet be seen. On June 1, 1515 (Henry VIII.) another spring at Lobery Mead (now Grosvenor Square) was presented to the town by John Flemynge. The water was led to a water-house (which until recently could be seen in Waterhouse Lane) and thence to the still existing house, which was quite close to it. From this water-house lead pipes conveyed the water to the town, and, together with sundry wells of a purely local character, including the Houndwell Well (1490, Henry VIII.), constituted the water supply until 1803. The first Act of Parliament was obtained in 1747, followed by others in 1803 and 1810.

About 1804 the No. 1 reservoir was constructed. It collected surface water from the common by means of earthenware pipes, and a line of elm pipes conveyed the water to the town. This reservoir has been abandoned, and the banks levelled down.

About 1811 the No. 2 reservoir, and about 1832 the No. 3 reservoir, was made on the common. They also collected the surface water, which was conveyed to the town by a line of 10-inch cast-iron pipes. They continued in regular use until 1852, after which, and until recently, the water was used only

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for road watering. They have now been converted into ornamental waters.

In 1838 the deep well on the common was commenced, and the work was carried on intermittently until 1883, when it was finally abandoned at a depth of 1,317 feet (842 feet in chalk), having involved an expenditure of 20,000*l.* for a yield of only 130,000 gallons per day.

In 1851 a supply of water was obtained from the river Itchen, at Mansbridge, the works comprising a brick and masonry-lined subsiding reservoir (3½ million gallons), a pair of Cornish engines and three boilers, at the same time the two upper reservoirs, Nos. 4 and 5, on the common were constructed. The old supplies were then discontinued, and in 1865 the Mansbridge works were increased by the addition of a second engine and boiler-house, containing a pair of coupled rotative engines and five Lancashire boilers. An additional boiler had meanwhile been added to the older plant.

In 1884 the water in the river Itchen had become so liable to pollution that it was determined to abandon that source and obtain a supply from wells sunk in the chalk at Otterbourne, to accomplish which an Act of Parliament was obtained in 1885. The works were put in hand at once, and the original portion was completed by June 1888. In 1896 large additions were made, and yet further extensions are now in progress.

The Otterbourne works, when the extensions are completed, will comprise two wells and a shaft 100 feet deep, about 1,500 feet of adits, a pumping station at a level of 90 feet above Ordnance datum, containing four compound beam pumping engines and three boilers, a workshop; softening plant, consisting of lime mills, lime cylinders, lime storage tank, mixer, softening tank and filters; four limekilns, a quarry with hydraulic hoist, waste deposit tanks, a railway siding, roadway, and seven cottages for the working staff. The area of land acquired is 13 acres, to which 35 acres and four houses are about to be added for protective purposes.

The quantity of water pumped during the the year 1901 averaged 3½ million gallons, and often exceeded 4 million gallons, per day, the population supplied being about 77,000. The trade supplies equal over one million gallons per day. The capital outlay upon these works has been about 85,000*l.*, to which must be added about 12,000*l.* for extensions in progress.

The water is pumped from these works through a 24 inch main—about to be duplicated—to a covered reservoir on Otterbourne Hill, whence it gravitates to Southampton through

24 inch and 16 inch trunk mains, the surplus water going to reservoirs Nos. 4 and 5, which were covered in in 1897.

The total capital outstanding upon waterworks accounts is only about 170,000*l.*, and, in connection with the very moderate working expenses incurred, enables water to be supplied for domestic purposes at the exceptionally low rate of 10d. in the *£* on assessable value (without extra charge except for fire pipes), and for trade purposes at 8d. per 1,000 gallons, the then being still a surplus sufficient to reduce the general district rate to the extent of 4d. or 5d. in the *£*.

There is being erected an additional independent compound rotative beam engine, of the Woolf receiver type, driving a high and a low-lift pump. The cylinders are respectively 28½-inch and 38½-inch diameter, with stroke of 4 feet 9 inches and 7 feet. The distribution of steam is effected in the high-pressure cylinder, by means of Meyer's variable expansion slides, driven off the crank shaft and the radius of the parallel motion; and in the low-pressure cylinder by means of Cornish valves, driven, by means of tappets and cams, off the crank shaft. The normal speed of the engine will be 18 revolutions per minute, and the indicated horsepower about 125, when working against a head of 235 ft. The steam pressure is to be 60 lbs. per square inch, and coal consumption is guaranteed (under the pain of penalties) not to exceed 2½ lbs. of the best Welsh steam per actual horse-power of work done by the pumps themselves. The condenser is of the multitubular surface type, the water raised by the engine passing through it. The pump is 22 inches diameter, with a stroke of 2 feet 6½ inches.

The low-lift pump, which draws water from the bottom of a well and delivers it to the softening works, is of the bucket and plunger type, the bucket being 22 inches in diameter with a stroke of 5 feet. The high-lift pump, which receives water from the softening works and delivers it into the Otterbourne reservoir, is of the by-pass bucket and plunger type (having suction and delivery valves of exactly the same size and pattern), the pump piston being 19½ inches diameter with a stroke of 7 feet. This pump delivers 10 per cent. more water than the low-lift pump, this quantity of water being pumped for use in the softening process. The pumps are driven from the outer end of the engine beam, the connecting-rod being between them. This engine will be identical with the three already at work. The waterworks engineer is Mr. William Matthews, M.Inst.C.E., by whom the foregoing particulars were kindly supplied.

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# The Architect.

## THE WEEK.

IF the campanile of Venice has to be rebuilt, it will be necessary to seek subscriptions from other countries besides Italy. For such a purpose the opinions of artists will in France exercise much influence over the multitude. M. GEORGES BOURDON has endeavoured to record in the *Figaro* the conclusions of several well-known sculptors and painters. M. FRÉMIET says reconstruction is inevitable, but the new campanile must be identical with the old, and an obligation should be imposed on the architects to make the copy rigorously exact. M. DENYS PUECH declares rebuilding is easy enough, and it is possible to impart to the stones a patina which will make them appear ancient. But the new campanile will never be the one which was loved. He maintains there is no use struggling against fate, for everything is doomed to pass away. No one dreams of reconstructing the Parthenon or the Coliseum. Ruins have their poetry; they are more serviceable to evoke beauty than the most splendid structures. It would be better to leave the ruins of the campanile and of the loggia than to rebuild them. M. RENE BINET is of a similar opinion; but if the tower must be rebuilt, it would be better to have it in its primitive form than to suggest the tops of mustard-pots, the Wallace fountains and the American stoves with which modern architects surmount their structures. M. BINET, like M. DENYS PUECH, evidently is not an admirer of French architects. M. MUCHA thinks the campanile was impressive because it was the witness of a glory that has departed. If reconstructed it can only possess a relative value, but he also prefers to have a copy rather than deliver the Place St. Marc to the mercy of architects. M. GUADET, architect of the Comédie Française, believes in reconstruction, the fragments found in the ruins being employed as models for details. M. GÉROME, the painter, also desires to see an absolutely integral copy of the old campanile; but he, too, has a prejudice against architects, and he professes to know them well. He would give severe orders, from which he would not tolerate the least departure. M. NENOT, the architect, is of opinion that unless there is a reconstruction the Place St. Marc will show an excess of horizontality. He, in his turn, sets small value upon the opinions of critics, as they are only the advocates of artists, and they can find arguments for their pleadings on one side as well as on the other. M. BONNAT is also sceptical about the work of modern architects, and, as a philosopher, he holds it is better to accept the misfortune and to think about something else. M. JAMBON, the scene-painter, is afraid of the inventive genius of architects, and although he does not consider the campanile was a great work, yet, on account of its associations, he would have it reproduced without any modification. M. RAFFAELLI wishes to see not only the same form but the new materials resembling the old, as they were subjected to centuries of sunshine and rain. M. EMANUEL ORAZI as an Italian has had the courage to state that the campanile was heavy and formless, without any definite character or artistic interest and out of keeping with its surroundings. People, however, had grown accustomed to the monstrosity and the lamentations arise from the loss of a familiar object. It was like a piece of old furniture, and a reproduction would have a double amount of ugliness, for it would combine the old and the new. The chief loss is the work of SANSOVINO, which was a masterpiece of purity and harmony, and in destroying it the campanile was doing injury to the last. With such a medley of opinions it is doubtful whether Frenchmen will largely contribute towards the rebuilding.

THE reputation of Russian artists rarely extends beyond the boundaries of the empire. One of the exceptions was MARC ANTOKOLSKI. He obtained a médaille d'honneur from the Paris Exposition of 1878, and immediately afterwards was admitted into the Legion of Honour. He became one of the corresponding members of the French Institut. In Russia he was among the councillors of State,

and it was commonly believed that he was the greatest sculptor produced in the North. He died at Homburg on the 9th ult., after a long illness. As he was born in 1842 in Wilna, he had only attained his sixtieth year. Ability is not confined to any rank, and ANTOKOLSKI belonged to that Hebrew race which is the most oppressed class in Russia. His father was only a poor workman. His talent was recognised, and in his twenty-first year he entered the Imperial Academy of Art at St. Petersburg, where he remained for five years. Owing to his failure to gain commissions, and possessing no money to purchase marble, he began his career with modelling little groups of terra-cotta of a humorous kind, like those which are familiar in France and Germany. Many of them were good-humoured caricatures of the people of his race. In 1871, through some beneficent influence, he had an opportunity to demonstrate his power by his large marble statue of IVAN THE TERRIBLE, the first Russian ruler who assumed the title of Czar. IVAN, who lived in the sixteenth century, recalls the mythic legends of wholesale slaughter, but the Russians of a later time consider him to be one of their heroes. The statue is now in Moscow. The success of this work enabled ANTOKOLSKI to carve other statues which were mainly imaginative or traditional in their portraiture. Like many of his countrymen, the sculptor was attracted to Paris, and lived there. He occasionally visited Russia, where his talents continued to be admired, and his death is therefore a national loss.

THE collection of papyrus records relating to the city of Arsinoë in the Fayoum suggests that there was a great similarity between the names of the streets and those in modern towns throughout Europe. Some were called after buildings which stood in them, such as Gymnasium Street and High Temple Street. Others recall the names of deities. Geographical position was also suggested by Lower Street, South Street or Western Street. There were evidently traders' streets, for we hear of Salt Merchants' Lane, Linen Weavers' Street and Clothiers' Market. In Paris, in the vicinity of the St. Lazare terminus, there are streets which from their titles might be presumed to lead to the various capitals of Europe. Something of the kind was found at Arsinoë, as in Arabia Street, &c. Individual names were also used, as Demetrius Street, Theon Street, Ammonios Lane, Therapeia Street. One of the principal thoroughfares was known as King Street. We may yet discover whether the houses were distinguished by numbers and the names of occupants, but we are never likely to ascertain whether uniformity of appearance prevailed among the houses, as in English towns.

AN addition to technical publications has appeared in *Business Illustrated*, an unconventional magazine-review (The Bishopsgate Press). It is intended to occupy a field between the technical journal and the popular magazine. The most interesting article in the first number is devoted to the great horticultural building industry at Loughborough, known as MESSENGER & Co., Ltd. There are ample accounts, with illustrations of the various departments. Not only are there all varieties of horticultural buildings, from the smallest glass to the palatial conservatory, but as our readers are aware, there are a great many appliances for regulating the temperature of the structures, and also special inventions for heating. The Midland Horticultural Works comprise, therefore, workshops for dealing with wood and glass, besides others in which metal is utilised, and thus we find combined foundries, engineering workshops, &c. A vast industry has been created, by which art comes to the aid of nature to enable us to produce and retain colour and form in vegetation which otherwise could not survive in our climate. In describing the works of Messrs. MESSENGER & Co. it does not appear to us that sufficient importance has been attached to the architectural merit of the conservatories. It is possible to carry out architects' designs in various ways, but in the Loughborough structures it is easy to trace a feeling for architecture, and consequently, in all the details, whatever the material employed, we see lines and contours which must gratify the most fastidious. Indeed, in many cases it must be owned that the horticultural annexe is more beautiful than the residence itself.





PAINTERS' ARCHITECTURE: RAPHAEL.

## SURVEYORS AND THE QUEEN VICTORIA STREET FIRE.

By A SURVEYOR.

UNDER the ordinary inquest powers, the City coroner, Dr. WALDO, with the able assistance of Sir HOMEWOOD CRAWFORD, the City solicitor, last month conducted an inquiry upon the Queen Victoria Street fire, and, in addressing the jury on the opening day, the coroner remarked that the duty of the Court was twofold, *i.e.* firstly, it had to discover the cause of the death of the unfortunate persons involved; secondly, to inquire into how far the fatal results of this fire were preventable.

Regarding the latter point, the coroner considered that they would "primarily have to investigate the inefficiency of the fire extinguishing and life-saving appliances and their application by the Metropolitan Fire Brigade;" and, further, "the structural safeguards for the escape from the building concerned—whether such safeguards existed, if so, whether they were sufficient, and if not, why not?"

As far as we are concerned, we will only deal with questions of Fire Brigade efficiency, management, or tactics at the end of these lines, as space permits, for we have had occasion before to express adverse views as to the force in practically everything outside the personal activity and bravery of the men, and the very excellent planning and construction inaugurated in Mr. BLASHILL'S time.

For the moment we would only deal with the "cause" of the fire, and its "preventability" by what the coroner describes "structural safeguards."

As to the "cause," this is of considerable importance to architects, inasmuch as electricity is being installed in nearly all modern buildings under their supervision, and the risks attending electrical installation are not yet fully appreciated by them. There is still an inclination on their part to rely altogether too much on the wiring contractor for advice rather than to call in an electrical consulting engineer to supervise this part of the work, of which the majority of architects can, at the most, have but a superficial knowledge.

The "cause" of the fire, as could be distinctly seen from the evidence of the second and third sitting, was an electrical cause. A certain basket of artificial flowers with illumination lamps, prepared for Coronation purposes, started the fire. This basket was apparently connected to the ordinary mains and the lamps were hence, we assume, under current. Whether the actual first spark was due to "short-circuiting," owing to the insulation in the wiring being worn off—which is not unusual where pendants swing from one point—or whether it was due to a defective lamp becoming over-heated, are points which will probably never be cleared up. But the object lesson is served, inasmuch as the importance of good insulation for pendant work cannot

be too strongly emphasised, whilst the advantage of a double pole switch, more particularly in workshops and factories where all kinds of attachments are frequently made to the different circuits, requires most careful consideration.

Had it been one of the lamps, for instance, that caused the outbreak, the question to ask would be whether the lamps used were English-made standardised lamps or lamps of a foreign make, or what would perhaps be worse, whether they were some of the many inferior lamps technically known as "throw-outs," which several of the English supply companies were recklessly using in order to meet the Coronation demands for a cheap and not necessarily standardised illuminant. It is common knowledge that in order to meet the demands of the Coronation several makers were selling English lamps which, in the ordinary course, they would have broken up as ineffective. There were actually lamps of this description on the market with wrong voltage and wrong candle-power, not to the extent of a mere difference of, say, a 110-volt lamp being supplied for a 105-volt current, or a 210-volt lamp for 200-volt current, or perhaps an 8 candle-power lamp supplied instead of a 5 candle-power lamp. These "throw-out" lamps were actually sometimes as much as 30 to 50 volts out from standard, whilst the supposed 5 candle-power was found to be 16 candle-power, or even more. Such irregularities of course really create a new danger, which has been made more apparent by the Coronation, and the recklessness of the electrical trade generally. It would be well for architects to bear this in mind, more particularly when entrusted with temporary decorations and the like, and to make their contracts subject to responsibility in the case of wrong supplies. We would almost say that these supplies are criminally wrongful, the dangers involved being so far reaching; for with the modern tendency of covering up lamps with shades of all kinds of paper, silk, and even celluloid, the extra heat engendered only too easily becomes the cause of fire.

It would be difficult and unlikely, as we have indicated, for a jury of laymen in the absence of expert assistance to elucidate the detailed electrical cause of the outbreak, and as we have pointed out, it was impossible for the jury to say more than that the fire was caused by electricity, but it might be in the interests of the Institution of Electrical Engineers and of the representative institutions of architects and surveyors if this matter were cleared up. It is, of course, generally known that the rapid growth of electricity for illumination purposes has brought with it a large personnel of unskilled labour and a great amount of negligence, and as in the case of the lamp, so architects should be generally warned against the cheap and dangerous forms of wiring with badly soldered joints, so often adopted by unconscientious electricians.



As far as regulations are concerned, the Building Act does not deal with electrical risks, and our theatre regulations only indirectly deal with them, the matter being mainly left to the discretion of the electrical engineer of the London County Council. Our safeguards lie mainly in the inspections of the insurance companies and the supply companies, and it might be deserving of consideration whether the wiring rules which the Institution of Electrical Engineers itself considers essential should not be administered by some central and responsible authority in the same way as the Building Act is administered from Spring Gardens, with the aid of the statutory district surveyor.

Leaving the general question of "cause," on which the evidence has certainly been very ample, we would now turn to the structural safeguards, which, of course, involve both questions of plan and construction proper.

The offices of the General Electric Company were offices of an ordinary type, situated in a corner building, of which the Company had the whole occupation, and upon its business increasing the directors took additional offices in the upper floors of an adjoining house, breaking through the party wall in order to obtain access. It was through this opening in the party wall that the employees in these upper floors of the adjoining premises had their sole ordinary means of approach and exit.

It is apparently quite clear that there were not forty employees used for manufacturing purposes in this additional block, and according to the Home Secretary's dictum in the House of Commons, the whole of the premises cannot in any way be looked upon as a factory, although from the common sense point of view, whether there were only twenty employees occupied in the actual manufactory as distinct from warehousing, type-writing and book-keeping is mere "splitting straws." At all events, the building was not under the Factory Act, it was not under the Home Office Register, and hence was not subject to the inspection of the London County Council. There is also nothing in the Building Act which would make this building controllable, for it was erected before 1894, had not been subject to any material structural alterations, and even if it had been subject to material structural alterations, it would not even have come under the clause which requires certain buildings to have exits to the roof. Whether the case is affected at all by the regulations for employers' liability we do not know, but as this point has so far not been raised we assume that learned counsel and others do not consider that it has any bearing on the question. The net result, however, is that there is no regulation in force, of all our many laws and by-laws, by which a building of this kind, of which there are many hundreds, if not thousands, within the square mile of the City, can be in any way controlled.

Further, although it has been in the mind of both those who drafted the Building Act and in the mind of many legislators dealing with this Act and with the Factory Act to improve the protection of employees; any attempt to obtain this amendment has always been vetoed by Parliament in some stage or other, with the result that no progress has been made in this direction.

We hold it absolutely essential that all buildings of certain cubical content, and all factories and warehouses employing a certain number of hands, no matter whether they be described as clerks, warehousemen or factory hands, should be subject to control, and above all, that any change in the purpose of a building should be compulsorily notified to the Building Act and Factory Act authorities. As the law stands at present a building may practically contain 200 employees, the majority of whom are clerks, storekeepers, warehousemen and even fitters, who are assembling different parts of an apparatus in order to send them out in its complete form, and there may be only ten or twenty employees actually workmen manufacturing a new article from raw material. Nevertheless, the whole of this structure, with its beehive of 200 hands, is not considered a factory, and does not come under any regulation. The anomaly of this is as obvious as it is serious.

As far as the City inquiry is concerned, there is certainly in law nothing which either landlord or occupier is compelled to do for the safety of the employees. As a matter of fact, it appears from the evidence that there was

some attempt at installing hydrants, fire alarms, and drilling a private fire brigade in order to meet emergencies of this description, which, although done in a very amateur manner, certainly resound to the credit of the occupiers, for attempts in this direction are seldom made among the vast majority of employers.

But to our mind there is a great moral responsibility for every employer of labour in safeguarding his staff, and although we recognise it is common practice not to attend to their safety, we believe that after this fire there will be a very different standard of public opinion on these matters, and that any employer again having the misfortune in the City of London to encounter such serious loss of life among his staff will be held morally responsible, no matter what the legal reading may be. We would hence endorse what the executive of the British Fire Prevention Committee wrote some little time ago, namely, that the fixing of the personal responsibility of employers is one of the main objects that should be striven for. This localisation of personal responsibility of employers is practised in many of the individual States of the United States of America and in several continental countries, and the mere feeling of employers that they can be placed in the dock on a charge of manslaughter for neglecting the safety of their employees would give the whole question of fire prevention, not only in respect to loss of life, but also in respect to loss of property, a very different aspect.

Again, it is obvious that the Building Act requires modernisation, not only on questions of safety of life, as shown by the Queen Victoria Street fire, but also from the point of view of loss of property, for it is indeed a serious matter that the Metropolis should be subject to such a destruction of property as occurred in the Cripplegate and Barbican fires. No remodelling of the Building Act or provision in it to meet modern requirements by modern methods would, however, be complete if the regulations were not made to some extent retrospective; and whilst we do not wish to see the resources of the landlord or occupier drained too heavily with costly "improvements," there are many simple safeguards which are obtainable at small expense, and yet mean much in the safety of the community and the safety of property. Thus, the mere question of the provision of an ordinary trap door and ladder exit on all buildings, new and old, throughout the Metropolis, would be invaluable for the safety of life, whilst much again could be done by the mere pugging of all floors separating shops from tenements, and the compulsory fireproofing of the partition which generally separates the passages from the staircase of a house in front of which a shop has been added.

The Metropolis has always suffered from a decentralisation of administration and a confusion of responsibilities. Thus, there is considerable confusion in the administration of matters referring to the safety of life and property, whether it be by preventive measures, in which we are at present interested, or in questions of the Fire Brigade. Where so much time is frequently spent by the authorities on matters of trivial importance, it would be well to consider whether an entire remodelling of everything relating to fire protection under one central authority might not be of advantage.

If we recollect rightly, the Municipality of Glasgow, which is more far-seeing than we are, had an Act in Parliament not long ago, known as the "Fire Protection Act," in which everything was practically dealt with in relation to the safety of the city, both as to life and property. It is a Fire Protection Act centralising all questions of safety from fire in factories, warehouses, theatres and public places of amusement, as well as in the ordinary tenement, shop and dwelling-house, that London requires at the present time, and with the rapid development of the Metropolis, these questions are becoming of grave import.

It was, we believe, within the scope of the coroner's jury at the Guildhall to make general proposals in this direction by means of a "rider," but the actual rider was a limited one, dealing only with the question of making the Building Act retrospective. It is, however, to be hoped that the Corporation will press for the revision of our fire protective arrangements generally, and we are sure that the comparatively large body of architects and engineers who are located within the square mile of the City will do everything in their power to assist any suggestion in this direction.



It would, indeed, be a boon to architects if there were one central authority and one Act dealing with all questions of fire protection, as far as buildings are concerned, rather than the present unfortunate state of numerous authorities, each with inadequate power and a confused conception of their duties.

And now for the very few words which space permits in respect to the Fire Brigade. To all technical minds outside Southwark and Spring Gardens the inefficiency of the Fire Brigade has been apparent for several years. There are not enough firemen, they are not officered in the right way, they are not properly equipped, and they are most improperly trained. The daring fire-quencher of old and the policy of dare-devilism are only to-day required in a minor degree, and mainly as an attribute to technical knowledge and skill. What we require are firemen who understand buildings and building construction, trained carefully in fire geography and tactics, and officered by men who are preferably surveyors, civil engineers or royal engineers by training. The naval man or the military officer with an amateur liking for the glory of a fireman's life are not the right class of people to select our Fire Brigade officers from. We require something very different, and until the chiefship of the Fire Brigade is changed and the Brigade itself receives a good sprinkling of artisans and mechanics, we are not likely to obtain a Fire Brigade that will meet the exigencies of London. The second officer, we believe, is an old borough surveyor and a member of the Institution of Civil Engineers; it is only to be regretted that he cannot make his influence more felt at headquarters.

In the course of the Fire Brigade evidence, we heard much of the Metropolitan Fire Brigade having the best appliances in the world's market, which statement would have been an obvious untruth had it not been merely due to ignorance. That such ignorance should, however, be seriously put forward in an open inquiry is a disgrace to the London County Council's powers of discrimination in the selection of its staff.

#### THE ENCYCLOPÆDIA BRITANNICA.\*

A PROMINENT feature of the latest volume of the "Encyclopædia Britannica" is the series of articles relating to electricity. They are by recognised authorities on conduction, currents, discharge, lighting, traction, industrial developments, electro-chemistry, metallurgy and magnets. They form, in fact, several treatises on the latest advances of the science. Professor R. H. THURSTON, of the Cornell University, is a well-known writer on engineering subjects in the United States; he describes the newest forms of elevators or lifts which are in use in the lofty buildings in American cities. In his remarks on safety he says:—

Safety devices constitute, perhaps, the most important of the later improvements in elevator construction where passengers are carried. The simplest and, where practicable, most certain of them, is the "air cushion," a chamber into which the cage drops if detached or from any cause allowed to fall too rapidly to the bottom, compression of the air bringing it to rest without shock. This chamber must be perfectly air-tight, except in so far as a purposely arranged clearance around the sides, diminishing downwards and in well-established proportion, is adjusted to permit a "dashpot" action and to prevent rebound. The air-cushion should be about one-tenth the depth of the elevator shaft; in high buildings it may be a well 20 or 30 feet deep. The Empire building in New York is twenty storeys in height, and its air-cushion, at the bottom of 287 feet of travel of cage, is 50 feet deep, extending from the floor of the third storey to the bottom of the shaft. Sliding doors of great strength, and automatic in action, at the first and second floors, are the only openings. The shaft is tapered for some distance below the third floor, and then carried straight to the bottom. An inlet valve admits air freely as the cage rises, and an adjusted safety-valve provides against excess pressure. A "car" falling freely from the twentieth storey was

checked by this arrangement without injury to a basket of eggs placed on its floor, the weight being about 1 ton. The velocity of the fall attained a maximum at about 70 miles an hour, assuming retardation by friction to the extent of about 10 per cent. Other safety devices usually employed consist of catches under the floor of the cage, so arranged that they are held out of engagement by the pull on the cables.

The Employers' Liability Act is reviewed by Mr. MAURICE HILL. He has to acknowledge that definition is difficult or impossible, and all that can be done in each case as it comes before the Court is to decide whether it falls within or without the Act. Many ambiguities have already been made clear by authoritative definition, but no statement of the effect of the Act can be made with any approach to finality. Enamel has been only lately introduced or revived in this country. An article on it by Mr. FISHER, who can claim to have "rediscovered the making of many enamels, the secret of which had been jealously guarded," explains the process, which in good hands can produce gorgeous results. Collectors may find an advantage in remembering that imitations of old enamels, even to the cracks and scratches incidental to age, are now in demand, and sometimes are of a quality to deceive experts. The doctrine of energy in mechanics, which was first announced by SADI CARNOT, "the organiser of victory," is treated by Dr. LARMOR of Cambridge. Steam-engines in the latest forms are described by Professor EWING and gas and oil engines by Mr. DUGALD CLERK. English political history during the reign of Queen VICTORIA is narrated by Sir SPENCER WALPOLE, that of Europe by Sir D. M. WALLACE, and of France by Mr. J. E. C. BODLEY.

The article on fire and fire extinction is partly by Captain WELLS, the chief officer of the Metropolitan Fire Brigade, and partly by General ROCKWELL, of the United States. There is a striking difference between the two contributions. The information given about the London system is mainly statistical, and is sufficient to show that the Fire Brigade has not reached the efficiency which is required for the Metropolis. Although in America the danger from fire has been increased by high buildings and great manufacturing establishments, yet there has been a remarkable freedom from disastrous fire owing to the general employment of fireproof construction, the numerous appliances for the extinction of outbreaks, and the excellent organisation of the firemen. The automatic sprinklers have been proved to be most successful; the automatic alarm has been introduced in more than 600 buildings in Boston and 2,000 in New York. A fire-alarm system is installed in most of the cities and towns. In Boston there is a salt-water fire system consisting of about 5,000 feet of 12-inch cast-iron pipe. Water drawn from an inexhaustible supply can be concentrated in enormous streams upon a given point. Chemical engines and portable extinguishers also find favour. Evidently in the United States invention is encouraged and with satisfactory results. The appearance of the article is opportune, although, unhappily, it is not convincing about our superiority in providing for the encounter with a terrible enemy. The article on forests and forestry, by Professor SCHLICH, of Cooper's Hill College, and Mr. G. PINCHOT, of the Yale Forest School, calls attention to a subject which has been long undervalued in this country. In Great Britain and Ireland, it appears, the population multiplied in the period 1880-1900 by about 20 per cent., whilst the imports of timber have grown by 45 per cent. The wood pulp imported into Britain consumes at least two million tons of timber. Of materials besides timber derived from trees and used for commercial purposes the annual imports are of a value of about eight millions sterling. In Ireland there are three million acres which are useless, and what appears more remarkable, "even within a radius of fifty miles of London 700,000 acres of land are unaccounted for in the official agricultural returns." We might imitate the example of Saxony, which derives a net revenue of 21s. an acre from its State forests. India in twenty-five years has increased the annual revenue from forests.

Without fine timber we cannot have fine furniture. There is not only required beauty of surface, but strength which will allow of delicacy in supports. The breaking of the grain of wood is an expedient which is not favourable

\* The new volumes of the *Encyclopædia Britannica*, constituting, in combination with the existing volumes of the ninth edition, the tenth edition of that work, and also supplying a new, distinctive and independent library of reference dealing with recent events and developments. The fourth of the new volumes, being vol. xxviii. of the complete work. (Published by the *Times*, London.)



to endurance. In some of the examples of the new style, to which Mr. J. H. POLLEN devotes himself in his all too short article on furniture, the contorted lines are sometimes arranged in order to avoid ill effects. As was to be expected from long service among the old examples in South Kensington, Mr. POLLEN is not favourably disposed towards the L'Art Nouveau. He says:—

The French makers of the new style of furniture seem in some instances to have a positive distaste for straight lines. They delight in strange curves, usually sweeping curves with sudden twists. Wardrobes and china closets are pyramidal, chairs and seats have raking legs, table-legs are fortified with bronze, &c. One cabinet is made to represent a leaf-clad arbour, with tree-trunks, branches and boughs entwined to the life. A pianoforte in the American section of the exhibition was no less extreme an instance of the new taste, a tree-trunk being carved along the front of its bed. Such an instrument as a pianoforte is entirely artificial; the very wood of it is taken from the choicest part of the tree, dried and prepared with the utmost care. How is this symbolised by a stem to imitate nature, however well sculptured? It is obvious that an interior furnished in this manner must be lacking every desirable qualification for home life. A piece of furniture is not a painting; it has a use, and the use must be kept in sight throughout. The naturalism of the Nancy workers extends to the working of the metal; the ormolu lines of flower and leaf-work are fastened along the edge of cabinets and wardrobes, and then carried up to the tops, where they bend over and form a sort of buttress to support a shelf. In chair frames the craftsmen bind all parts of the seat, as if a kind of strap were necessary round a decaying object. As lightness is a merit in chairs, brass bars and straps ought not to be necessary to their security. The marquetry work of this modern school is also purely realistic, and the attempt is made, notably by Gallé of Nancy, by various coloured woods, to represent nature in colours, a questionable use of that form of decoration when applied for use.

The articles on gas explain the endeavours towards enrichment by means of tar, oil gas, volatile hydrocarbons, &c. The introduction of incandescent mantles is a result of long and anxious experiments. They are generally composed of 99 per cent. thoria with 1 per cent. cerium. Professor LEWES is clear and concise in his explanations. Mr. DOWSON in his article on gas plants points out "that a modern Dowson gas plant is now working regularly at the historical works of BOULTON & WATT at Soho, Birmingham, and that the holder used for this gas is one which was erected there by WILLIAM MURDOCH, the pioneer of gas lighting."

There is a valuable contribution on geology by Sir A. GEIKIE, relating to the changes of view and additions of knowledge in the larger questions involved, such as the cosmical aspects, dynamical and structural geology, which are described with characteristic vigour. In Zonalstratigraphy it is concluded the next advances will be made in the investigation of formations and the history of organic life. In connection with the great problems of space and force which geology suggests there are possibilities for the use of non-Euclidian geometry, of which the Hon. B. A. W. RUSSELL is the exponent.

The new volume, like its predecessors, is noticeable for its variety, and the literary skill shown in the treatment of the subjects removes it from the class of the old encyclopædias. There are certain branches of science which it is almost impossible to discuss with a light hand, but with those exceptions it is surprising with what pleasure the majority of the pages can be read. The illustrations include plates of English and foreign pictures.

#### AN INDIAN ARBITRATION CASE.

THE position of an arbitrator in a building case is onerous, and the courts to whom such subjects appear often as insoluble problems generally are disposed to uphold his decisions. An Indian case which came before the judicial committee of the Privy Council a few days ago will exemplify the practice. It related to the erection of the Victoria Jubilee Town Hall in Lahore, a building which was completed in 1890. On the completion of the work disputes arose between the contractor, Mr. BUTA, and the Municipal Council, which it was arranged should be referred to Mr. J. C. HAYWARD and Mr. P. ROSS. The award was published on June 30, 1891. Mr. BUTA, as contractor,

wrote on the same day asking for (1) a copy of the award given by the arbitrators; (2) a copy of the details furnished by the arbitrators in respect of all the items; and (3) a copy of the order given by Mr. SINCLAIR, junior Government advocate, in reply to the letter addressed to him by the secretary of the municipal committee, under which a decision was passed as to the powers of the arbitrators. On July 27 Mr. BUTA wrote to the arbitrators raising objections to the award and stating that unless he got a "sound and satisfactory answer" to his objections he was not prepared to accept the award. The Council, however, accepted the award, and the plaintiff was informed on July 30 that they were prepared to hand him "a cheque for the balance of the amount due, after deducting from the amount of the award the sums that have been paid to you already." Application was made to have the award filed, and the balance, amounting to 10,395 rupees, was paid into Court and afterwards handed over to Mr. BUTA. He subsequently filed a plaint for adjustment of accounts and recovery of the money that may be found due to him for work done and materials supplied under the contract of 1887, for additional work done outside the contract and for damages. No reference was made to the arbitration and award, but the defendants relied upon the plaint as an answer to the greater part of the demand, and they disputed the claim for damages. The plaintiff by his replication challenged the award on the ground that "the arbitrators exceeded their jurisdiction and were guilty of misconduct," and that, "if valid, it was so only to the extent of the matters with which the arbitrators dealt." In the agreement of reference it was stated that in addition to questions relating to measurements and prices the arbitrators were to consider "all other matters in difference, controversies, claims and demands whatever now subsisting or depending by or between the said parties, or in any wise incident or relating thereto." The arbitrators having applied to the secretary of the Municipal Council as to whether the clause was distinct or subordinate, he wrote to Mr. SINCLAIR, who said the clause "merely covers any incidental or minor matters arising out of the main subject of the reference to arbitration, viz.—(1) measurements; (2) rates where not fixed, and must be taken and construed accordingly." The correspondence was not communicated to the plaintiff until after the award was made, and the omission to do that was one of the acts of misconduct charged against the arbitrators. Their lordships of the judicial committee considered that although there might be an error of judgment on the part of the arbitrators there was no ground for impeaching the good faith of any of the parties concerned or the correctness of the opinion given by the counsel consulted. It was also alleged that Mr. HAYWARD delegated his duty to his son and employed him to take the measurements instead of taking them himself. On that point the evidence of Mr. ROSS was that "Mr. HAYWARD was present when the measurements were taken except once, and he was present throughout the inquiry except once, which was towards the end of the inquiry. Their lordships said that the parties had the benefit of Mr. HAYWARD's experience and judgment on the matters referred to him, and there was no doubt that an arbitrator might delegate to a third person the performance of acts of a ministerial character, which was at most all that Mr. HAYWARD did in this case. The charge of misconduct against the arbitrators therefore failed as regarded the form of the award. Their lordships saw no reason to doubt that the arbitrators came to an honest determination upon the specific matters referred to them, and any faulty direction they might have given in excess of their authority might be treated as null. On all other matters the judicial committee were no less decided, and finally it was resolved that they would humbly advise HIS MAJESTY that the decrees of the Chief Court of the Punjab of July 20, 1898, ought to be confirmed and the appeal dismissed. The appellant must pay the respondent's costs of the appeal. The case is remarkable as coming from India, and the points raised on appeal were remarkably subtle. There was undoubtedly a want of precision in the agreement of reference, but their lordships evidently considered that from the character of the inquiry it should not be scrutinised too closely.



## CORYAT AND THE CAMPANILE.

THE following letter has appeared in the *Times* :—

Sir,—In the year 1610 Thomas Coryat, of Odombe, in Somerset, the absurd but admirable author of "Coryat's Crudities," spent six weeks out of a four months' foreign tour at Venice. In his book, which was printed the following year, he particularly describes the tower of St. Mark's, dwelling with delight on the commodity of its ascent and the beauty of the view to be obtained from the summit. Would it interest your readers, while the recent catastrophe is fresh in their minds, to learn how these things struck an impressionable English traveller 300 years ago? Most people have heard of Coryat and of the grotesque humours by which it was his pleasure to make himself a butt among the wits and courtiers of his time. But his book is rare, and only students read it, or know how well he could observe and write when he chose to lay his fooling aside. Even of students, most, I dare say, remember another and less edifying passage from his account of Venice rather than the one I am about to quote. Yet the serious charm of the city, "the fairest lady, nay the richest Queene and Paragon in Christendome," as he calls her, loses nothing in passing through the "Odombian limbecke," and from the days of James I. to those of Victoria no one has expressed that charm in terms more just and glowing.

There are many notable things (writes Coryat) "to be considered in this Piazza of St. Marke, the principall whereof I will relate before I come to the description of St. Marke's Church and the Dukes Palace. Most memorable is the Tower of St. Marke, which is a very faire building, made all of bricke till towards the toppe, being distant from St. Markes Church about some eighty foote. It is from the bottome to the toppe about some two hundred and eighty foote, and hath such an exceeding deepe foundation that some doe thinke the very foundation cost almost as much as the rest of the building from the ground to the top. This Tower is square, being of an equall bredth in every side—namely forty foot broad. The whole top is covered with pieces of brasse, made in forme of tyles that are gilt. Such is the height of this Tower that in a faire season it is to be seene by sea from Istria and Croatia, which is at the least one hundred miles from Venice; the staires are made after such a strange manner that not only a man, or woman or child may with great ease ascend to the top of it, but also an horse, as it is commonly reported in the citie. But I thinke this will seeme such a paradox and incredible matter to many, that perhaps they will say I may lie by authority (according to the old prouerbe) because I am a traoueller. Indeed, I confesse I saw no horse ascend the staires, but I heard it much reported in Venice, both by many of my countrey-men and by the Venetians themselves; neither is it unlikely to be true. For these staires are not made as other common staires by which a man can ascend by no more then a foote higher from staire to staire till he commeth to the highest; but these are made flat, and ascend so easily by little and little in heighth, that a man can hardly be weary, and scarce perceiue any paines or difficulty in the ascent. . . . When you haue ascended almost as high as you can, you shall leaue the staires, and enter into a voyde loft, and from that you are conueyed by a short ladder into a little square gallery butting out from the Tower, and made in the form of a tarrasse, being supported with faire round pillars of alabaster. From euery side of which square gallery you haue the fairest and goodliest prospect that is (I thinke) in all the world. For therence may you see the whole modell and forme of the citie *sub vno intuitu*, a sight that doth in my opinion faire surpasse all the shewes vnder the cope of heauen. There you may haue a synopsis, that is a generall view of little Christendome (for so doe many intitle this citie of Venice) or rather of the Ierusalem of Christendome. For so me thinks may a man not improperly call this glorious citie of Venice: not in respect of the religion thereof, or the situation, but of the sumptuousnesse of their buildings, for which we reade Ierusalem in former times was famous about all the Easterne cities of the world. There you may behold all their sumptuous Palaces adorned with admirable variety of beautiful pillars: the church of S. Marke which is but a little way therence distant, with the Dukes stately Palace adioyning vnto it, being one of the principall wonders of the Christian world; the lofty Railto, the Piazza of Saint Stephen, which is the most spacious and goodly place of the Citie except S. Markes; all the sixe parts of the citie. For into so many is it diuided as I haue before said; their streetes, their Churches, their Monasteries, their market places, and all their other public buildings of rare magnificence. Also many faire gardens replenished with diuersity of delicate fruites, as Oranges, Citrons, Lemmons, Apricocks, muske melons, anguriales, and what not together with their little Islands bordering about the citie wonderfully frequented and inhabited with people, being in number fifty or there about. Also the Alpes that lead into Germany two waies, by the Citie of Trent, and the Grisons country; and those that leade into France through Sauoy, the Appennines, the pleasant Euganean

hills, with a little world of other most delectable objects; therefore whatsoever thou art that meanest to see Venice, in any case forget not to goe up to the top of Saint Markes tower before thou comest out of the citie. For it will cost thee but a gazet, which is not fully an English penny; on the toppe of the tower is erected a brasen Angell fairely gylte, which is made in that sort that he semeth to blesse the people with his hand."

When lately that angel was cast down in the very vestibule of St. Mark's Church, and the tower and its staircase sank together, Coryat must surely have turned in his far-off grave at Surat, where he died six years later, after long wandering in Egypt, Palestine, Mesopotamia and the East Indies. The sequel of his description concerns the Loggetta of Sansovino, now shattered with all the rest. Living in the flush of the English Renaissance, Coryat shows himself full of enthusiasm for this work, which Ruskin, the impassioned Gothic gossamer of our own age, had no eyes for, and would little have missed even had it perished in his day.

"There is adioyned vnto this tower a most glorious little roome that is very worthy to be spoken of, namely, the Logetto, which is a place where some of the Procurators of Saint Markes doe vse to sit in iudgement, and discusse matters of controuersies. This place is indeed but little, yet of that singular and incomparable beauty, being made all of Corinthian worke, that I neuer saw the like before for the quantity thereof. The front of it looking towards the Dukes Palace is garnished with eight curious pillars *versicoloris marmoris*, that is, of marble that hath sundry colours; whereof foure are placed at one side of the dore, and foure at another. The steppes of the staires, which are in number foure, are made of red marble. Two faire benches without it of red marble. The walke a little without paved with Diamond pauier contriued partly with free stone, and partly with red marble, all the front of red marble, except the images, which are made of most pure alabaster ouer the tribunal where the Procurators sit, the image of the Virgin Mary is placed bearing Christ in her armes made of alabaster, and two pretty pillars of changeable-coloured marble on both sides of her, under whom this is written in a little white stone, *Opus Iacobi Sansouini*. The sides of the dore are made of alabaster, and the top rayled with a curious tarrasse of alabaster. On both sides of the dore are foure very goodly faire statues made in brasse, two on one side and two on the other. Each betwixt a paire of those curious pillars that I haue spoken of; on the right hand as you enter the dore there are these two, the statue of *Mercury* with a dead man's skull under his feete; the other the statue of *Peace* with a burning torch in her hand, wherewith she burneth an helmet (a strange thing to burne steele with fire) and a Target. On the left hand these two; Pallas very exquisitely made with an helmet and a feather in the crest, a shield in one hand and a trunchin in another, a mantle about her and a Souldiers coat of maile; the other the statue of *Apollo* like a stripling without a beard, with an horne in one hand and a quier full of arrowes in another hanging down about his necke. All these statues were made by Iacobus Sansouinus, a Florentine."

I am, Sir, faithfully yours,

SIDNEY COLVIN.

## THE CAMPANILE AND CEMENT GROUTING.

IN a letter to the *Times*, Sir E. Durning-Lawrence says :—It seems now to be demonstrated that the cause of the collapse of the Campanile of St. Mark's was that the materials of which it was composed had by the lapse of time lost their coherence, so that the whole was little better than a mass of dry dust. It is therefore not unnatural that others as well as your correspondent whose letter appears in the *Times* should be persuaded that it would have been an impossible task to have rendered this grand old tower once more safe and strong and able to endure for another 1,000 years.

This is, however, a mistaken view, as it would have been perfectly easy and even cheap to have made the structure as strong and, perhaps, even stronger than when first erected.

Any tower of masonry which is fairly upright and the foundations of which are not hopelessly irreparable can be rendered strong and safe, as the Campanile could have been rendered strong and safe, by the simple process of drilling holes about 4 inches in diameter nearly through the masonry (masonry includes brickwork) and pumping into the structure Portland cement grouting. The holes should be about 3 feet apart, and commence at the bottom. It is generally possible to do this work from the inside so that the facework is not in any way disfigured. In the case of the perished Campanile about eight or ten thousand such holes would have been required, and these should have been cut or drilled at the rate of about fifteen or twenty a day, commencing at the bottom of the tower, the Portland cement grouting being pumped into the holes each day as the work proceeded. The whole process



would thus have occupied about two years, the labour on each hole for drilling and filling costing about three francs, or half a crown. About 400 or 500 tons of Portland cement would have been required, say, 1,500*l.* to 2,000*l.*; superintendence and further repairs to stonework and contingencies about a further 2,000*l.*, so that 5,000*l.* would probably have perfectly restored the whole.

Treated by this method the Campanile would perhaps have been considerably stronger and more durable than when first erected. An old brick, which is scarcely more than a mass of dry dust, becomes when it has absorbed Portland cement grouting hard and strong, while the mere dry rubbish in the centre of the walling forms a solid mass of Portland cement concrete as hard, solid and durable as the best natural rock.

This process is exceedingly safe, simple and easy, and only two precautions are necessary, viz. not to proceed too rapidly with the work, and to take care that the Portland cement selected is of good quality and has been what is technically called "killed," i.e. exposed to the air on a barn floor for some two months before being used as grouting in order that it may not expand—or "blow," as it is called—after it has been pumped into the walling.

Nearly any masonry structure and most natural rocks can be rendered permanently strong by this simple process of pumping into them a grout of Portland cement, which is now being largely used by engineers in various parts of the world.

### CHESTER CATHEDRAL.

ON July 31 there was a dedication service held in Chester Cathedral on the completion of the memorial of the late Duke of Westminster.

The memorial takes a twofold form, and has been subscribed for by both city and county admirers of the Duke. Of the 10,000*l.* subscribed for the purpose, 7,000*l.* odd has been devoted to the restoration of the south transept, 1,849*l.* to a recumbent effigy of the late Duke in marble, and the sum which remains to various necessary incidentals. The south transept, which was once the parish church of St. Oswald and is a structure that has an interesting history, long presented a dilapidated incongruous appearance, parts of the stone walls and pillars having lain hidden under a coating of whitewash since, it is said, Reformation times, while other parts were chipped and broken, and there was a wretched boarded floor. Under the guidance of Sir Arthur W. Blomfield & Sons (the cathedral architects) Messrs. J. Thompson & Co., Peterborough, who were given the contract to fulfil, have wrought a wonderful transformation in the transept's internal appearance. The stone of the columns and walls, scraped of its whitewash, looks perfectly new, and this and the repair of the decayed and dilapidated stonework have made a vast improvement in themselves. But the restoration has proceeded much further. The stone vaulting of the western aisle has been completed, and the broad aisle has been vaulted in oak to harmonise with the architecture of the nave. The old boarded floor has been removed, and substituted for it is a level flooring of hard Yorkshire flags, laid on a bed of concrete. All these improvements have given the south transept of Chester Cathedral—one of the largest south transepts in the kingdom—a graceful and dignified interior, and have brought it into harmony with the general scheme of the cathedral architecture. The larger bosses in the centre aisle depict Old Testament scenes, and the four coloured ones are heraldic, representing the arms of the Grosvenor family, the Archbishop of York, the Bishop of Chester and the Dean of Chester. The bosses in the western aisle, which are carved out of huge blocks of stone, represent scenes in the life of our Saviour, including the Baptism of our Lord, the Transfiguration, the Resurrection and the Ascension.

The recumbent effigy by Mr. Pomeroy of the late Duke has been placed in the centre bay of the western aisle, and rests on a sarcophagus or altar tomb designed by Mr. Chas. Blomfield in sixteenth-century style. The latter is worked in Staffordshire alabaster, and is divided into eight large panels, each containing a heraldic shield of the Grosvenor arms; and the capping, which is one piece of alabaster, is a solid bronze bearing in raised burnished letters the inscription, "To the Glory of God and in memory of Hugh Lupus Grosvenor, first Duke of Westminster, K.G., Lord Lieut. of the County of Chester. Born October 13th, 1825, died December 22nd, 1899." The effigy is in Carrara marble of the purest quality, and is a fine example of the sculptor's art both as regards the fidelity with which the features of the late Duke have been reproduced, and the beauty and finish of the carving. The recumbent figure lies in a position of calm and natural repose with the head resting on a cushion, the feet touching lightly the back of a Talbot dog, and the hands meeting across the breast. The figure is robed as a Knight of the Garter, and

in the droop of the drapery, as in other portions of the work, the sculptor has attained as near perfection in stone as one can conceive to be possible. The effigy rests upon a plinth of Sienna marble, which intervenes between it and the alabaster tomb. The latter has been executed by Messrs. W. Haswell & Son. The same firm has also done the polished marble floor of Genoa green and Pavonazza which surrounds the monument, and had charge of fixing the memorial in its entirety. The monument is enclosed by ornamental railings, consisting of a bronze plinth, wrought-iron sides relieved by bronze mouldings, and at each angle a Talbot dog holding a heraldic bannerette. All the metalwork has been carried out by Messrs. Hart, Son, Peard & Co, London and Birmingham.

### STONEHENGE.

IT was anticipated that a long discussion about the control of Stonehenge would be heard at the meeting of the Wilts County Council on Tuesday. But the effect of a letter from Sir Edmund Antrobus, which was referred to by Lord Edmond Fitzmaurice, M.P., was to delay the proceedings for the present. His Lordship said:—That letter, the actual text of which he was not warranted, without leave, in communicating to the Council, in his opinion opened up a reasonable prospect of successful negotiations for the purchase of Stonehenge. The letter concluded by giving him a very courteous invitation to visit Amesbury in order to go into the matter with Sir Edmund Antrobus. Beyond that he could not then go, except that he thought it was only due to Sir Edmund Antrobus that he should immediately say this, that the statement which he supposed they had all heard, and which had got into the public Press, that Sir Edmund Antrobus ever asked 125,000*l.* for Stonehenge and the land immediately adjacent was quite untrue. That matter related to a far larger negotiation, and not only was it not the figure named for Stonehenge, but it related to negotiations for land from which Stonehenge was expressly excluded. He thought it was only right that he should say that, because he thought it would clear the air. Another aspect of the matter which he wished to urge upon the Council was to express his deliberate opinion that to have a discussion about rights of way and other topics seemed to him to be an unnecessary and a risky thing in the present circumstances, because it might interfere with the success of those negotiations to which he had alluded for purchase, and to which, it seemed to him, they must eventually look forward as a satisfactory solution of the question. His object in making that statement was to ask the Council whether it was worth while discussing the question at all that day.

The Hon. Percy Wyndham, as chairman of the roads and bridges committee, had given notice to move the following resolution:—"That the Council, being informed by the report of the committee on roads and bridges that such committee, having duly considered the reports of the three members of the sub-committee appointed to hold an inquiry into the subject matter of the petition of the Amesbury Parish Council under section 26 (4) of the Local Government Act, 1894, alleging a failure on the part of the Amesbury Rural District Council to take action in regard to the obstruction of certain alleged public rights of way at Stonehenge, and having also taken into consideration the evidence given at the above-mentioned inquiry, do not recommend the County Council to take over the powers and duties of the Amesbury Rural District Council in regard to the alleged rights of way. That the County Council further record their agreement with the opinion expressed by the committee that the question of public free access to Stonehenge and the enclosure of the monument, which were largely mixed up by the petitioners with the questions of the rights of way, are not questions in regard to which the Council has jurisdiction." Mr. Wyndham said he was quite willing to accept generally what Lord Edmond Fitzmaurice proposed. The motion he was going to move would no doubt have led to a general discussion, but in the circumstances he would not move it.

Mr. J. M. F. Fuller, M.P., said he fully agreed with the course it was proposed to adopt, because he thought it would be a public disadvantage to go into the merits of the case after what Lord Edmond Fitzmaurice had said. It was well known, however, to many members of the Council that he was prepared to move in the matter, but he now joined with the previous speakers in expressing the earnest hope that nothing more would be said at that meeting of the Council.

Lady Butler, the wife of General Butler, commanding the Western District, on Monday laid the corner-stone of an obelisk which is being erected by Mr. Molesley on Plymouth Hoe to the memory of Prince Christian Victor and the soldiers of the West of England who fell during the South African war.



### NOTES AND COMMENTS.

It is to be hoped that if any negotiations are entered into for the purchase of Stonehenge they will be conducted with tact. Salisbury Plain has been for so long a time regarded as a common, it was to be expected that people in general should imagine that Sir E. ANTROBUS had no right to prohibit the public from approaching the stones in any way they pleased, or to enclose the ground with a barbed-wire fence. We have already pointed out that in this case, as in others of minor importance, law must be respected, and it declares that an owner's rights are of paramount importance. The Wilts County Council have no wish to undertake the costly experiment of asserting imaginary rights. The task would therefore fall upon the local parish council, that under the circumstances would appear as a litigant under most unfavourable conditions. We do not believe that the owner is desirous to make a profit out of Stonehenge, but he is not to be blamed for upholding his claim to the land with whatever stands upon it. In any case it will always be possible for a visitor to see Stonehenge, and the interest and mystery of the stones are not in the least diminished by the precautions taken by the proprietor.

It is difficult to resist the conclusion that technical assistants of all kinds are not in favour with the official world. It has repeatedly occurred that men of that class have been passed over when opportunities for promotion arise, and the appointments given to officials who have only the general knowledge of the ordinary Civil servant. Routine always wins the day in a competition with skill. But it is not only in promotion that a difference is made. The grievances of the Ordnance Survey employés which were brought before the House of Commons by Sir BARRINGTON SIMEON and Major LEE afford a remarkable revelation of the partial way in which pensions are bestowed. Assistants appointed prior to 1870 are in receipt of pensions, but the men appointed after that date, who perform identically the same work, after spending the best years of their life on the Survey, are treated as day labourers, and when they leave the service do not receive the least compensation. The principal reason adduced is that discontent would certainly be created in one half of the staff if pensions were allowed to the other half. Everyone is aware that in the Civil Service jealousy is rampant, and a man is no sooner promoted than those who have a chance of succession begin to speculate about his disgrace or death, but it was not to be expected that in a department like that of the Ordnance Survey there should be a desire to restrict pensions to a limited few, although an increase in the number of pensioners would not diminish the amounts which were arranged. It is more probable the true cause is the dislike to men who have had a technical training.

DURING last week many members of the Royal Society of Antiquaries of Ireland visited Londonderry and other places in that district. Archæology is not suggested by the property of London companies. But although the modern spirit may prevail, that part of Ireland can show as many records of old times as districts in the south or west. Derry appears to have possessed a church as far back as A.D. 546, and it has been a bishop's see since 1148, or some years prior to the English invasion. The reputation of Londonderry is in modern times mainly connected with the famous siege of 1688-89. Some of those who took part in the excursion visited Brough, where the gold ornaments now in the British Museum were found in 1896. The circumstances under which the objects were obtained have been described by Mr. ROBERT COCHRANE, F.S.A., the honorary general secretary, in a paper which we shall publish next week. It will be observed he suggests that the ornaments have had a local history, and without any disregard of probability, they might have been memorials of the visit of St. COLUMBA to the district, and votive offerings for his delivery from shipwreck on his voyage to Ireland with a Scottish

king. When the trial takes place the right to the possession of the ornaments will be contested on other grounds than those furnished by archæology. But in such a case too much information cannot be forthcoming. Another place visited is the Greenan of Ailech, about four miles from Derry. It is a prehistoric fortress. In the fourth century of our era we are told that FRIGRIUN, a famous builder or architect, eloped with the daughter of the king of Scotland, AILECH, and brought her over for protection to Ireland. King FIACHA gave them this fortress for a residence, and hence it is called Frigriun. This king FIACHA was killed in battle A.D. 322. Here FRIGRIUN built a splendid palace of wood for his wife. The material was red yew, carved and so studded and emblazoned with precious stones and gold and bronze "that day and night were equally bright within it." The ancient Irish admired architecture as well as other arts, and it is not every country which can produce a parallel to the interesting legend.

M. GUILLAUME, the French sculptor, is a gentleman who is remarkable for urbanity no less than for administrative and artistic skill. For the third time he has been elected as Director of the French Academy in Rome. The sculptor dates his acquaintance with Rome from 1845, when he entered the city as winner of the Grand Prix. He has had a long experience of official responsibilities. In 1864 he was appointed Director of the Ecole des Beaux-Arts; he held the post for about fifteen years. Then he became Director-General of Beaux-Arts. Afterwards he was sent to Rome, and he has presided over the Villa Medici for eighteen years. M. HÉBERT, his predecessor, held the office for five years, HORACE VERNET for six years and INGRES for six years. SCHNETZ was director for nineteen years, but they were not in succession, for there was an interval of six years between the two terms. M. GUILLAUME is one of the few artists who is a member of the French Academy. He owed his election to his writings on art, which we have noticed at some length. But the sculptor of the *Gracchi*, *Le Faucheur*, *Anacréon* and the Caryatides of the Pavillon Turgot has had to sacrifice his art for the sake of devoting himself to official duties.

FRENCH tapestry, if we may judge from the prices given for old pieces, is never likely to be superseded in the affections of one class of amateurs. Like CLEOPATRA, age cannot wither it, for the older it grows the more reposeful are the colours. The official exposition which has been organised in the Grand Palais of the Champs-Élysées will probably be more visited by artists than by any other section of the inhabitants of Paris. The exhibits belong to all the periods that have elapsed since COLBERT bought the factory belonging to the GOBELIN family in 1662 down to the last century. Tapestry was woven at the expense of the State in various parts of Paris, but the Minister wished to have them all united under one controlling power. CHARLES LE BRUN became director, and the style associated with his name was long respected in the factory. But designs were obtained at all times from some of the first artists in Paris, and it was often difficult to understand why a composition was executed in tapestry rather than in oil-colours. In order to keep up the reputation of the tapestry the wool used was dyed in the factory. CHEVREUL, the famous chemist, was appointed superintendent of the dyeing department. He received several complaints about the want of permanence in some colours and the want of vigour in others. After many investigations he ascertained that the wool dyed at the Gobelins was equal to any he could purchase, and he was obliged to seek another cause for the failures. His researches enabled him to announce the law of the simultaneous contrast of colours, which was made the subject of a book published in 1835. The Gobelins factory is, therefore, connected with the history of science in France, as well as with the history of art. It is satisfactory to know that the labours of the chemist, as well as of the artist, have produced works which seem destined to survive all the vicissitudes of taste.



## ILLUSTRATIONS.

BEACON TOWER, MARINE RESIDENCE, WALMER, KENT.

**W**ALMER LODGE, Walmer, of which we present some plans this week, and a sketch of one of the features of the elevation, and of which we also presented a perspective view of the hall and a perspective view of the principal staircase on July 11, is the marine residence of Mr. ALBERT OCHS, which has been recently entirely remodelled from designs by and under the personal supervision of Mr. EDWIN O. SACHS.

The property, when purchased by Mr. ALBERT OCHS, comprised a rambling house of exceptionally ugly appearance and eminently impractical plan, the result apparently of numerous previous alterations and additions by an amateur.

The position of the building, overlooking to the east the Goodwins, with Walmer Esplanade on the north and



Walmer Castle abutting on the south, made it, however, well worth the owner's while to spend much thought and labour on making the house a thoroughly practical residence to meet the requirements of the modern week-end of a business man, as well as the general entertainment and house parties of a country season. And it should here be remarked that the position of Walmer lends itself particularly well to business men, inasmuch as it is within easy motor-drive of some twenty minutes from Dover, which has boat-express trains to town and excellent continental services.

Mr. SACHS's instructions were to gut the worst portions of the building, alter such part of the premises as could be adopted, and to add a wing with the view of obtaining extra accommodation. There was, further, the specific instruction of creating a good look-out tower, from which an extensive view, both seawards and landwards, could be enjoyed, and that some attempt should be made to render the exterior of the structure less displeasing to the eye than at the time of purchase. The result has been a ground-floor plan comprising a small vestibule, a large square oak hall with gallery, and staircase hall, around which are grouped the

large drawing-room and library, secretary's room, dining-room with servery, and billiard-room, as well as a small schoolroom. This floor has an average height in the old part of 12 feet from floor to floor, and in the new part of 13 feet 6 inches. The hall, gallery and staircase are treated in light oak, in the English Renaissance style, as already illustrated. The drawing-room is in the Louis XVI. style, the dining-room in Queen Anne style and the billiard-room in Dutch style. Parquetry is laid throughout. Electric light is installed to a very considerable extent here, as throughout the house, and all the modern facilities of speaking tubes, telephones and the like have been made use of. Fire hydrants have been installed and all the various services of hot-water heating, hot and cold water supply.

A special feature are the dado rails throughout this floor, from which electric light can be obtained at any point, as they are grooved and fitted on the E.L.B. system.

As to the first-floor, Mr. SACHS had to accord the accommodation of a morning-room in the best position, and the necessary bedrooms for the family, including three children, together with tutor's room and maid's room. Besides these, spare rooms had to be provided—three double-bedded and one bachelor's room. Three bathrooms were provided in suitable positions. The feature of this floor is a long passage or corridor reaching from end to end, with light at each end, intended to be a useful "quarter-deck walk" in bad weather. The decoration of the first-floor rooms is of the simplest character, with whitewood fittings.

The new wing alone was taken up to form a second-floor, with servants' accommodation, and has been entirely devoted to this purpose, but the back staircase is continued up into the tower, from which a particularly excellent view can be obtained. The height of the tower from ground to top of finial is 85 feet. The finial is equipped with an electric light and weather vane, and a large gong bell has also been fitted in the tower.

Turning to the basement, Mr. SACHS has so arranged this lower floor as to enable an easy service with a small staff when used for week-ends in the winter, and yet sufficient accommodation for large entertaining in the summer. Thus, there is a large kitchen and also a scullery kitchen, a pantry with a large servants' hall, which is also fitted for pantry purposes for entertaining, and the like. Throughout the basement white tiles have been used and blue paint, whilst all kitchen fittings are teak-topped and copper-lined.

Of specialists' work in the building, we would notice that the whole of the electric-light work, with fittings, also the hot-water appliances for heating and the hot and cold water services are by Messrs. STRODE & Co., whilst everything else, including decorative work, was undertaken by the general contractors, Messrs. TROLLOPE & SONS, working under Mr. SACHS's instructions, Mr. SACHS being represented by Mr. LISTER, his manager, and Messrs. TROLLOPE by Mr. PARSONS.

As to the exterior of the building, an attempt has been made to modify its ugliness and bad proportions, and to frame the windows and openings with Italian mouldings, whilst the large surfaces are rough-cast. This, together with the aid of flower-boxes and later with creepers, at all events, makes the building a pleasing group to the eye, the new wing having done much to improve the general grouping of the building, which, with its loggia towards the sea, and terracing, makes quite a pretty picture, both from seawards and from the south. Unfortunately many of the sash-windows had to be retained, and thus the better effect of the casement-windows, particularly if divided into small squares, is lost.

In respect to the grounds in which the house stands, Mr. SACHS delegated the whole of the garden design to Mr. T. H. MAWSON, who, by terracing, created an English formal garden, which in due course should be a most picturesque adjunct to the property. The terracing, which also has a picturesque summer-house, some sun-dials, gates and other artistic features, certainly assists the general appearance of the building.

Perhaps we should here remark that the site of Walmer Lodge became the subject of considerable interest about a year ago, when, in the course of excavations, a number of



very valuable and fine specimens of Roman remains were found, including glass vases, terra-cotta work and coins. These have been carefully arranged, and now form an interesting exhibit in the principal hall of the building.

#### THE PUBLIC BENEFIT BOOT COMPANY'S PREMISES, TRURO.

THESE occupy a very commanding position at the corner of King Street and Boscawen Street in the very heart of the city, and where all the principal traffic converges. Upwards of 12 feet have been taken off the King Street frontage of the property for the purpose of street widening. The material used for the walling is best red facing with buff Ruabon terra-cotta dressings, and the contrast is an agreeable one in colour. The roofs will be of Delabole slate, and the works generally of a very solid and substantial description. The company to which it belongs are very enterprising, and have branches all over the country, with headquarters at Bristol and Leicester.

Mr. SILVANUS TREVAIL, P.S.A., of Truro and Palace Chambers, Westminster, is the architect, and Mr. WM. E. BLAKE, of Plymouth, is the builder.

#### CATHEDRAL SERIES.—HEREFORD: EAST END. SOUTH SIDE OF LADY CHAPEL.

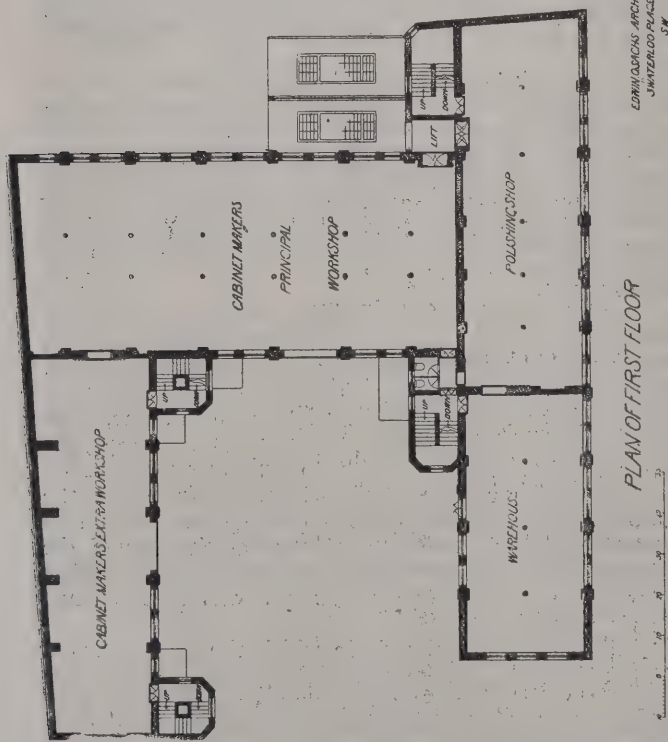
#### QUEEN'S HOTEL, LEICESTER SQUARE: SMALL DINING-ROOM. TABLE D'HOTE ROOM.

#### LANSDOWNE SOLDIERS' HOME, LIMERICK.

#### THE SHANNON FACTORY, DALSTON.

THE Shannon Factory, which is being erected for The Shannon Company, Ltd., at Dalston, will be a model cabinet-making factory. It is to be opened in the early autumn, and is already practically complete.

It has been designed and executed under the personal supervision of Mr. EDWIN O. SACHS, who was assisted by his manager, Mr. LISTER, and latterly by his partner, Mr. S. HOFFMAN; Mr. KISSACK acting as clerk of works, and the general contractors being Messrs. HOWARD & Co., of Bow Street, Covent Garden.

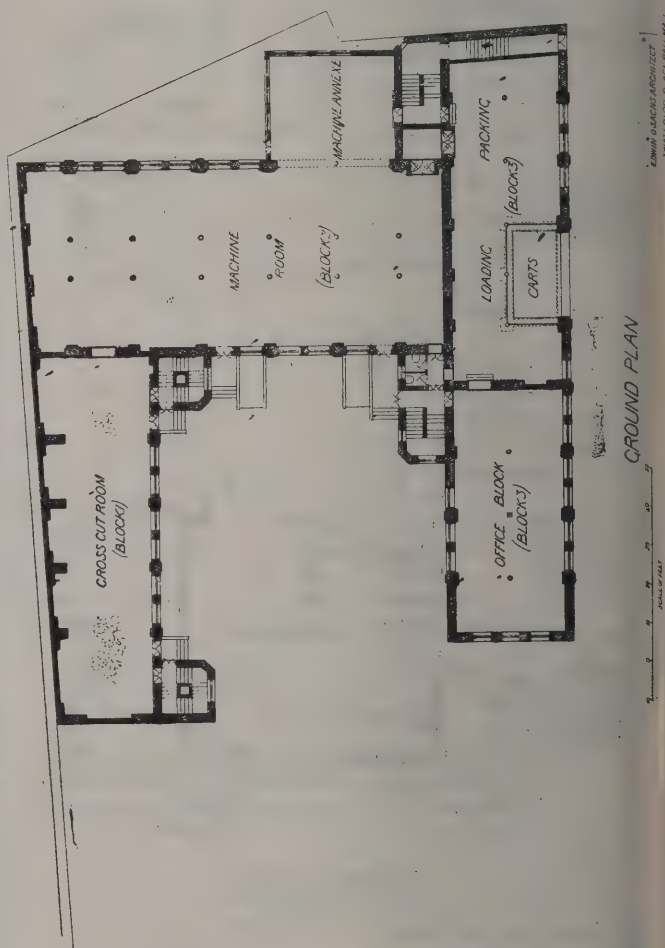


It is being equipped under the personal direction of the managing director, Mr. SCHAFER, in consultation with Mr. SACHS and Mr. RAVENSHAW, the latter acting as consulting electrical engineer. It embodies everything that is new in the best American and Continental practice, including a full equipment of modern American tools and machines, and much English plant on American models.

The purpose of the factory is the execution of first-class cabinetwork and the finer forms of joinery, as well as the general cabinet-making of the roll-top desk and other office utensils, with which the name of The Shannon Company, Ltd., has been so successfully associated, but in respect to which architects have certain prejudices on account of the American mouldings, which do not appeal to English taste, and which will now be almost done away with to make room for English work and designs.

The property taken by Messrs. The Shannon, Ltd., for their new factory and warehouse is at Dalston, close to Dalston Lane station, and is cut in two by a small street called Tyssen Street. The larger half of the site is now the scene of the present building operations, and this site measures 220 feet by 140 feet, and is almost rectangular in shape. Light is obtained in the aforesaid Tyssen Street on one side, from Tyssen Passage on the other, and as the land abuts on the Great Northern Railway, light is also obtainable from a third side.

The basis of the plan was the formation of a large central block, with two wings projecting, and thus forming



a semi-enclosed central court. Facing this court, but at the opposite end of the site, were to be placed the boiler-house, dry kilns and other minor adjuncts of the concern.

The main block has a basement 10 feet high, a ground floor 20 feet high, a first floor 20 feet high, a second floor 10 feet high and a third top-lighted floor. The west wing and east wing both have the same high ground floor, but the first floor is divided into floors of 10 feet high each, and thus a series of 10 feet floors are provided for.

The different blocks are separated by strong party walls and the various double iron doors required under the Building Act. Further, all the many provisions of the Factory Act have been most carefully acceded to, and in staircase accommodation, exit doors and emergency exits generally, there are few factories that can compare with this structure in the United Kingdom. The central block is particularly remarkable for the fact that it is just within the maximum limits of cubical contents that can be accorded in the county of London, and is hence, perhaps, the largest individual factory block in the Metropolis.

The Columbian Fireproof Flooring Company have had the construction of the floors, WENHAM & WATERS the



casements, the Crittall Manufacturing Company the iron doors, the Patent Impervious Stone Company the stone steps and general stonework. Fire-resisting floors have not only been used throughout, but the big columns, girders, &c., have been protected by 2 inches of concrete, and again, besides the constructional preventative measures, the entire blocks are being fitted with a sprinkler system.

Intercommunication between the different floors is by means of lifts, wells, cranes, as well as by the staircases. Conveniences for the staff are on every floor, and the west wing basement is devoted entirely to mess-rooms and dressing-rooms for the employes.

The actual division of the building into various workshops is not a matter that should be described at the moment, but it might be said that everything has been done to save unnecessary moving of material and to economise in labour. Runaways, trolley lines, &c., have amply been made use of.

Of the buildings facing the main structure, the boiler-house with its chimney 80 feet high is the most important, containing not only boilers, but also dynamo-rooms, &c., for creating the necessary power plant, the whole of the installation being worked by electricity.

Dust-removal contrivances, ventilation and heating apparatus are all on modern lines, worked from this central boiler-house.

The site that has been left vacant on the other side of Tyssen Street for the moment is the future location of a large warehouse for the company, which Mr. SACHS has so contrived as to materially assist the general *ensemble* of the group, particularly if permission can be obtained from the local authorities to arch over Tyssen Street.

As to exterior architectural treatment, an attempt has been made to follow the example so excellently set by Mr. ASTON WEBB in the design of his silos on the Thames, with the result that instead of obtaining the usual factory monstrosity, Mr. SACHS has been able to present a factory of architectural pretensions without in any way deteriorating the practical purposes of the building.

It is to be hoped that when the factory is completed it will be considered a suitable subject for a visit on the part of the Architectural Association and the other technical societies whose interest in model institutions leads them to make visitations, for both the design of the building and its equipment are highly instructive.

## THE NEWCASTLE SOCIETY OF ANTIQUARIES.

THE Newcastle Society of Antiquaries recently held their third outdoor meeting for the season at Morpeth and Bothal. Arriving at Morpeth station at ten o'clock, those present, under the guidance of Mr. R. Blair, one of the secretaries, drove to the parish church (St. Mary's), which stands on the Kirk, a hill about a quarter of a mile south-west of the town. Mr. Blair read a letter from Canon Bulkeley, rector of the parish, in which he stated the recent changes in the fabric, the chief being the carvings of the corbels in the chancel. Mr. Knowles gave a succinct account of the architectural features of the church, which, he said, for beauty of situation and its good state of preservation was one of the finest parish churches in the north. A visit to St. Mary's, Morpeth, was at all times a refreshment and inspiration.

Canon Walker Whalton followed with interesting remarks upon the purely ecclesiastical history of the church.

The Rev. the Hon. W. C. Ellis, rector of Bothal, said there were parallels between Morpeth Church and his own at Bothal in respect to their north arcades, the remains of old paintings on shafts of the arches, a low side window, and a squint or hagioscope. At Bothal they had the smallest squint known. Leaving the church they went to Morpeth Castle, and from thence to Morpeth town hall, where the mayor (Alderman Young) received them. They were shown Belted Will's mace, the corporation punch bowl and ladle, the mayor's gold chain, the corporation snuff-box and the branks, an iron instrument wherewith women scolds were publicly punished. In the clock-tower they saw the rope with which bulls were fastened to the ring in the Market Place when they were baited, it being a local law that no butcher should kill a bull until he was publicly baited. Others went to the town clerk's house and saw the town's hutch. The party then drove by way of Hebborn to Cockle Park Tower and thence to Bothalhaugh, the residence of the Rev. and the Hon. W. C. Ellis, who

entertained them to lunch. On the motion of Canon Walker, seconded by Mr. Hindmarsh, F.L.S., Alnwick, a cordial vote of thanks was conveyed to Mr. Ellis for his hospitality. He then guided them through the pleasure grounds by the banks of the Wansbeck. They proved a veritable world of arboricultural, agricultural and floral wonders, every region of the globe having been called upon to contribute to the endless variety of tree, shrub and herbaceous plant. Mr. Ellis supplied each of his guests with a printed account of his parish church of St. Andrew, and supplemented it with a verbal description of such features as were not included in it. He also described the architecture and heraldic shields of Bothal Castle, and with a further walk along his new carriage drive and cycle track, by the side of which British burials were pointed out, a delightful and instructive outing was brought to a close.

## SOMERSET ARCHÆOLOGICAL SOCIETY.

THE annual meeting of the Somerset Archæological Society was held this year in Glastonbury, under the presidency of the Dean of Wells. According to the annual report there are 601 members. In the course of the year a valuable collection of Roman and Mediæval antiquities, the gift of Mr. W. W. Walter, had been received. Other presents were obtained.

### *The President's Address.*

After the conclusion of the business the Dean of Wells gave his inaugural presidential address. Little need be said, he commenced, to so cultivated an audience as this regarding the claims of archæology or the study of antiquity. Man must ever be interested in the antiquity of man, and the date of man must be carried further back than seventy years ago had been imagined. Wookey Hole alone, which Professor Boyd Dawkins explored in 1859, would convince them of that, there having been found there a mixture of implements wrought by human hands along with the bones of animals long extinct in Europe—the rhinoceros, the elephant and the cave-bear, most notably. But the evolution of man and man's civilisation, the identity of man in the midst of constant development, the day of small things, the cave-dwellers of that day slowly changing to be the present wielders of steam and steel and masters of electricity, magnetism and wireless telegraphy, must deeply interest every active mind. Physically considered, the double land-bridge between Europe and Africa—one by Gibraltar and the other not less surely by Tunis, Sicily and Italy—the breaking of the double land-bridge, and the cutting off of elephant and rhinoceros from retreat to their southern home, could hardly fail to rouse even a sluggish imagination.

Turning to Glastonbury and its environs, the Dean said Glastonbury was acknowledged to be the very cradle of British Christianity, and later on it was the one great religious foundation which lived through the Norman Conquest, and in which Briton and Englishman have an equal share, as Professor Freeman had said again and again. It was the first Benedictine monastery founded in England on the lines of the first Benedictine home for monks founded A.D. 50 by St. Benedict himself, close to Subiaco, overhanging the sparkling waters of the upper Anio, close to the site of the villa of Nero, who had dammed up the Anio to form a lake. The church of Glastonbury was an abbey church, but it surpassed in scale and grandeur almost every cathedral church in England. It just equalled in length the 500 feet of Canterbury Cathedral, including Becket's Crown at the eastern end.

The British village,  $1\frac{1}{4}$  mile distant, was unique in the three kingdoms, he believed. It was also quite unlike the pile-houses of the Swiss lake villages, where he (the Dean) dredged thirty years ago. He had hoped Mr. Arthur Bulleid might have been there that day, for it was he who, on the inspiration of Bishop Hobhouse, followed up the abbot's waterways, and came to the field with sixty-six flattened tumuli, oval in shape. The generosity of the late Mr. Edward Bath at once permitted free excavation, and eventually he gave to the Glastonbury Antiquarian Society five acres of ground on which the village with its river quay stands. The contents that were worth extraction were mostly in the Glastonbury Museum, sorted exquisitely out of many tons of soft brown peat by the deft fingers of Mr. Arthur Bulleid. The museum was a model of what a local museum should be, and showed how apparent obliteration meant sometimes gentle preservation—how the water-logged vegetable mould in Somerset might embalm plain relics of hard primitive life as effectually as at Herculaneum and Pompeii dry volcanic ashes enshrined dainty surgical instruments with the mirror of the belle, the razor of the beau and the batterie de cuisine of the gourmet. He would end with a word about a great favourite of his—



Meare. The chancel of the church at Meare was built by the same abbot who built the Manor House and the Fish House there, Adam de Sodbury, fully 570 years ago, but the nave was about a century and a half later. About forty years ago there lay in a chest in Meare Church the armour of fifteen men whom the abbot furnished for the king's need. Putting aside palaces and castles, he could think of no village in England that possessed two houses of such great interest as unaltered specimens of the Middle Ages as that Manor House and that Fish House. They were older than the Order of the Garter, older than Windsor Castle, only a century and a half later than the still existing lady chapel at Glastonbury, a century and a half later than the completion of the beautiful north porch of Wells Cathedral, or the commencement of its great west front. The Manor House was a real manor house, where the lord resided for a while and met his people on business. The hall possessed noble windows and a noble fireplace, still remaining. The Fish House sadly needed a roof, and he hoped the meeting would not break up without undertaking to collect funds to roof, fitly and strongly, that interesting structure.

The Rev. H. H. Winwood moved a hearty vote of thanks to the Dean for his address.

The Rev. Prebendary Grant, in seconding the motion, gave on behalf of the Glastonbury Antiquarian Society a cordial welcome to the visitors, and expressed the hope that they would have a happy, pleasant, and instructive meeting.

The motion was carried with acclamation, and, after the Dean had replied, the meeting adjourned.

After luncheon, which was held at the George Hotel ("Ye Olde Pilgrimage's Inn"), itself one of the architectural features of Glastonbury, connected with the abbey, visits were paid to the various objects of interest in the town.

St. John's Church was the first place visited. Canon Scott Holmes, who gave a brief account of the imposing edifice, said it had very little history. The original Norman church was undoubtedly cruciform, with a central tower. The church was entirely pulled down by Abbot Selwood in 1456, who rebuilt it, and placed the tower at the west end. Some of the piers of the nave rested on the piers of the central tower. The screen ran right across the church and both aisles, enclosing the transepts. There was a fine tomb to a chapman of the abbey. The glass, although very beautiful, was nearly all modern, the exception being some in the south-eastern window of the sanctuary. Outside, on the north wall, were two mortuary crucifixes. The tower was one of the most elaborate in the county, but the ornament, not being structural, was not pleasing to severe critics. It was strange that the Abbot should build so fine and beautiful a church so near the abbey.

Colonel Bramble observed that he looked upon the church as a glaring instance of endeavouring to do away with solid work altogether. There was very little to support the superstructure.

The Rev. H. L. Barnwell (the vicar) gave some additional information regarding the church, particularly as to the restoration.

Mr. E. Buckle, hon. diocesan architect, pointed out several of the peculiar features of the church, and directed attention to the curious cusping in the bottom series of lights of the east window.

Prebendary Daniel spoke of the altars. Besides the high-altar, there were three altars, which were dedicated to St. Mary, St. Nicholas and St. George.

Still under the guidance of Canon Holmes, the party proceeded to the Abbot's kitchen, a unique structure with four large fireplaces, commenced by Abbot Fromund in the time of Edward I., and finished by John de Breynon in the time of Edward III. The only other Mediæval kitchen of the kind was at Stanton Harcourt, some few miles from Oxford, which was, however, of a later date than Glastonbury, though on much the same principle.

Canon Holmes next took the party to the famous abbey ruins, and gave them some valuable information respecting them. The interest in the abbey consisted in its connection of English with British Christianity. The earliest historian, William of Malmesbury, spoke of four churches surrounded by the buildings of the abbey. Those churches owed their origin—the first to the disciples of St. Philip and St. James, the second to St. David, the third to some unknown disciples from Britain, and the fourth to St. Aldhelm and Ina. William of Malmesbury knew nothing of St. Joseph of Arimathea, but Arthur was to him an historic warrior of the ancient Welsh. What he said about the legendary Arthur and the Holy Grail was of later interpolation. When Dunstan was abbot, in the middle of the tenth century, he was said to have rebuilt all except the old church, so that by the time of the Conquest there were only two churches—the old *Vetusta Ecclesia* and Dunstan's church to the east of it. The old church seemed to centre in itself all the legends, which grew more definite as they were separated by time from the events connected with them. In the thirteenth century the Grail legends took definite form

and got woven into the Arthur legend, and definitely located at Glastonbury. In 1278 Edward I. paid a visit, and, wanting to find Arthur, he was, of course, dug up with the lead tablet describing the fact that "These are the bones of Arthur." In 1345 the Joseph of Arimathea connection with the Holy Grail and with Glastonbury Abbey reached its perfection of definiteness. John Blome, of London, obtained a license by patent roll to search for the remains of Joseph, and of course he found them; and from the end of the fourteenth century to the Dissolution the lady chapel at the west of the great church, formerly called the old church, became known in the popular mind as St. Joseph's Chapel. Let them account for the strange antiquity of the legends. Avalon and Glastonbury were later forms of a mythical pedigree of ancient Celtic lore. Avall and Galst were gods of the lower world, and gods of the lower world were connected with the fairy world. So the Island across the Summer Seas became to be known as the Glassy Island, the Island of the Fairies—Yngo-Wytryn.

Mr. Buckle also gave an address on the architectural features of the abbey. He believed that it was built by the Somerset school of masons about 1184, and finished off in the Early English style. Both the great church and St. Joseph's Chapel he believed to have been built at the same time, and he could only conceive that it was deliberately built in an older style than that of the times to give it an antiquated character. He did not believe that there was ever a vista right through from one end to the other. When the vaults under St. Joseph's Chapel were built in the fifteenth century the floor was raised to save excavating beneath the foundations.

A pleasant break occurred after the inspection of the abbey ruins, the visitors, at the invitation of Mr. and Mrs. Stanley Austin, partaking of tea on the lawn of the Abbey House, where a large garden party was congregated.

The Rural Dean of Glastonbury (Prebendary Grant) next conducted the party to the church of St. Benignus, of which he is vicar. He said that the church, now erroneously called St. Benedict's Church, was originally built and dedicated to the memory of St. Benignus. It was recorded of him by John of Glastonbury that he came from Ireland, and spent the closing years of his life at Glastonbury; that he died and was buried at Meare, probably about 470. In 1091 his remains were taken up, placed in a coffin, and carried by bearers to be buried in the great church at Glastonbury. The bearers halted at various stations on the way, and at the last resting-place an oration was delivered, setting forth the excellences of the saint; an appeal was made to the faithful, and offerings came in so liberally that a church was built upon the spot as a memorial of his piety. It was dedicated to St. Benignus by the Bishop of Bath, John de Villula, probably about 1100. King Edward VI. gave the rectories of St. John the Baptist and St. Benignus to the Bishop of Bath and Wells in exchange for several manors. In the town hall there was the original appointment of Jeffrey Strode to the curacy of St. John the Baptist by William Strode, with the chapelries of St. Benignus and West Pennard. It bore the date of 1663. Stephen Lane (1495) willed that Joan his wife, immediately after his decease, should find "a fit chaplain to celebrate in the chapel of St. Benignus, for the space of three years, for his soul, and the soul of John Lane, his father, and Margaret his wife, and all the faithful deceased." There was abundant evidence to show that the church was dedicated to St. Benignus, and that down to the middle of the seventeenth century it was called the church or chapel of St. Benignus or St. Benning's. The church was restored by Abbot Beere. He also added the north aisle. His initials, R.B., with the mitre, were over the north porch. There was a small chapel on the north side, called the Sharpham Chapel. In 1884 it was found necessary to restore it again, and a new aisle was added on the south side. The small chapel on the south side of the choir was built by the Rev. W. Alnutt, as a memorial to his daughter.

After giving his description of the church, the vicar of St. Benedict's (the Rev. Prebendary Grant) said he intended to commemorate the Society's visit to Glastonbury by reverting to St. Benignus as the name of St. Benedict's Church. It was, as he had said, originally dedicated to St. Benignus, but had gradually got to be called St. Benedict's, but as the church of St. Benignus it would in future be called.

The Rev. F. W. Weaver congratulated Prebendary Grant upon bringing the somewhat obscure St. Benignus back to his rightful domains. He also hoped that Mr. Grant would bring influence to bear on the borough authorities to also rename St. Benedict's Street and call it St. Benignus Street in harmony with the church.

Mr. Buckle and Colonel Bramble having spoken on the architectural features of the church, the party proceeded to the Glastonbury Museum. Alderman Morland described many of the curiosities and valuables there seen, and as they were mainly brought from the ancient British Lake Village he interweaved an account of what was known of that unique village. He said the settlement must date from about 2,000 years



ago. There were iron tools found, and these were certainly previous to the Roman occupation, and in their searches no Roman coins had been found. The village was built up in the midst of a shallow mere or pool, and it rested upon the peat common to all the levels, and there was a considerable accumulation before the village was built. The village was constructed partly of peat, clay and stone. The fact was the people built on an island, which was above the water except possibly in flood times. The huts were generally circular, built with wickerwork, and must have been fairly comfortable habitations. The people were by no means savages, but some puzzles existed in connection with the remains found. One puzzle was that there were remnants of primitive civilisation side by side with comparative luxury. In the museum they had got a few of the articles which people lost in their occupation, but everything they could take away it might be supposed they took away. They would see numerous cases of pottery, some built up by hand, others certainly burnt on the wheel, and ornamented with a considerable amount of art, in certain instances having patterns decidedly beautiful. The animals associated were interesting. The roe deer was there and the beaver was still in the land, and most likely had a great deal to do in baying back the water. There were twenty-six species of birds, ten of which were ducks. They found bones of the bittern, the coot, the puffin, the sea-eagle and the crane. More remarkable, the most abundant were bones of the pelican, as that had never been considered an English bird, and the nearest place now where they would find a pelican was the marshes of the Danube. The people had short-horned cattle, possibly two breeds. Horses were used for riding, and they had the remains of harness left. They had also traces of pigs and sheep. They were very clever with woodwork, able to cut out thin strips and decorate them with a kind of poker-work. There must have been considerable inland trade and foreign trade at the time, for there was a ring of amber and one of jet. As far as they knew, the people did not weave anything but wool, which they used for their clothing and fishing nets. They did not know whether that was merely an occasional place of refuge or a permanent one. It seemed scarcely possible that 300 people could live upon those five acres of land, without cultivating land elsewhere or feeding their flocks elsewhere. It rather looked as if the place was a refuge.

The Dean of Wells thanked Mr. Morland for the interesting address he had given.

The annual dinner was then held at the George Hotel, the President in the chair, time not permitting the inspection of the Abbey Barn, the Almshouses and the Tribunal.

At the evening meeting for the reading of papers in the Victoria Rooms, the Dean of Wells presided.

Prebendary Daniel gave particulars of the churchwardens' accounts of St. John's, Glastonbury. He quoted Mr. Bulleid's assertion that the churchwardens of St. John's held an almost unique position among the churchwardens of England, and for more than 600 years they had been a corporate body with a seal. At one time the wardens received 6s. 8d. annually, and about 1484 that amount was increased to 10s. 5d. for each, on account of their diligence. Many quaint entries in the accounts were mentioned by the speaker, among them being money received for letting out torches for funerals, letting seats in the church, and occasionally selling graves in the church. There were entries of sums received from plays acted. Some interesting particulars were given of the expenditure of the church funds. In 1500 they resealed the church and no craftsmen were to be had nearer than Bristol. David Carver undertook the work for 417, paid in two instalments; but with carriage, &c., the amount came to 657. David and two men accompanied the worked wood, which was put in boats at the Back. The boats proceeded to Rook's Mill, in the parish of South Brent. Thirteen boats hired at Meare brought half the load and thirteen waggons brought the other part from thence, the whole time occupied being a week. No point of general history came before them in the accounts, and he supposed all that concerned the country at large drifted towards the abbey and the people of St. John's were not concerned in it. The accounts, however, possessed an interest concerning the way in which the church was managed and the life of the townfolk.

Prebendary Grant furnished some particulars of Sir Edward Dwyer, of Sharpham Park, who lived in the reign of Queen Elizabeth. His career was of special interest to the people of Glastonbury, and he was one of those distinguished men whom Glastonbury was proud to own amongst her sons.

The Rev. E. H. Bates made some remarks respecting the publication of the first volume of the new history of Somerset, and whether the word "Somersetshire" was to be allowed in the prospectus. Many opposed it on the dictum of Mr. Freeman, but if there was any county "shired off" from anything else it was their county of Somerset.

The weather, although slightly overcast, was propitious on the second day, when, from the George Hotel, Glastonbury, the archaeologists set off in a long string of vehicles for an

excursion to Meare and Wedmore. There were nearly 130 ladies and gentlemen in the party.

A stoppage took place about a mile and a half from Glastonbury, in order that the field in which discoveries respecting the interesting lake village had been made might be visited.

When the party had assembled on the site, Mr. Morland said he had been trying to reconstruct what the country was like before any of the timber they saw exposed was brought there. On one side it was bounded distinctly by the hills of Glastonbury, and between these he believed the river Brue was found. He thought the Brue helped to form the boundary before men took to cutting straight courses for rivers. On the other side there stretched five or six miles of water or lake, which gave the name to Meare. That lake appeared on successive maps always contracted in size, and finally it was drained, and the site became pasture ground. It was bounded on the other side by narrow hills, so that they had an area which was practically a shallow lake.

After the different excavated spots in the field had been inspected, and remarks made by Mr. Morland and Mr. St. George Gray, the party re-entered their vehicles and were driven to Meare.

The Fish House here first claimed attention. Mr. E. Buckle, who described the building, said it was very remarkable. It was a small house of the fourteenth century, and was almost perfect. The building was traditionally called the Fish House, but so far as he knew there was nothing documentary to identify it in any way. It, however, seemed a reasonable enough description. The house stood on the edge of a lake, and they knew that the chief fisherman to the monastery lived at Meare, and was one of the most important of the chief servants of whom they heard accounts from time to time in the records. That was supposed to be the house in which he lived and the building which formed his office. It had the peculiarity that there was no internal communication between the ground floor and the upper floor. The ground floor seemed to have been for the business department, keeping fish tackle, &c. The front door of the house was on the upper stage, and a flight of stone steps presumably led up to the door. The upper part of the house consisted of two rooms, a hall, which was the principal one, and a small room at the end. The structure was a fine example of a superior cottage of the seventeenth century. There was an appendage at one end which has disappeared, and there were signs of that little addition to the house.

Much interest was evinced in the Manor House, and the party, having ascended the stairs, found themselves in a fine hall. The house had belonged to the Abbot of Glastonbury, and as in those days the country was very moist the abbot lived upstairs, like the head fisherman. A magnificent fireplace was noted. The Rev. F. W. Weaver gave a few particulars of the building.

When the party had made their way to the church Mr. Buckle furnished a description, saying that the church belonged to two principal periods. The chancel was a great deal older than the nave, and was fourteenth-century work. There was a great deal of interest about the tracery of the windows. The architect was certainly a person of original mind. He had some idea of the direction in which the architectural style was tending at that time, and there was a little touch of the Perpendicular put in on the top of a purely Decorative window. The roof of the chancel was a little peculiar; it was so palpably that of a hall and not a church.

The Rev. B. T. Bussell (vicar) read a paper on the history of the parish, and subsequently the party drove to Wedmore, where the church and cross were inspected, and Mark Church was included in the day's programme.

On the Thursday, in threatening weather, but which held fairly fine all day, the archaeologists left Glastonbury at half-past nine for another day's excursion. By way of Northload Park, the party soon arrived at Ponter's Ball, Havyatt, an old earthwork, presumably made to defend Glastonbury from anything from the east. When it was thrown up the ground all round, except the narrow isthmus on this side, was all morass, so that the construction of this earthwork made Glastonbury perfectly safe from attack. It is thought to be more ancient than Roman, and that it dates back to very early times indeed. The field is 5 or 6 feet higher than the next field towards Glastonbury, leading to the belief that there was once a village close by, protected by the fortress.

The party next drove to West Pennard Church, dedicated to St. Nicholas. The tower is very massive, built about the time of Edward IV., and showing very distinctly the best type of Perpendicular work. There are carved angles in a string-course over the doorway of very beautiful design, and the arrangement of niches on either side of the west doorway and higher up in the tower is a characteristic feature of Somerset towers. In the interior is a beautiful sixteenth-century rood-screen and a characteristic Somerset nave ceiling. The wide easternmost arch obviously originally opened out into a chantry chapel, screened off from the nave, with a squint at the south



side of the chancel arch. In the churchyard is a beautiful cross, consisting of an octagonal base of four steps, with a square socket, containing sunk panels, sculptured in relief, on three sides of which are emblems of the Crucifixion, on the north side being the initials "R.B." under an abbot's mitre, said to be those of Richard Beere, abbot of Glastonbury, 1493 to 1524, who is supposed to have erected the cross.

West Bradley Church was next visited, a small and unpretending building, with a tower of plain design dating rather earlier than West Pennard, as shown by the plain, unpierced parapet. The drive was next resumed to Baltonsborough Church, dedicated to St. Dunstan, who is supposed to have been born here. For a Somerset church this is peculiar, consisting of a nave wider than usual without aisles. There are several interesting Mediæval gable crosses in a fair state of preservation, and on the north side of the church the rood-stair turret still remains. There is a very rich Mediæval drop ring handle and escutcheon to the south door, and the massive Mediæval bench ends with fifteenth-century mouldings are very interesting.

Butleigh Church was then visited. This was originally dedicated to St. Benedict, but now called St. Leonard's. It is also believed to have been dedicated to the two St. Johns, emblems of both having been discovered in the church.

On leaving Butleigh the party proceeded to Street, stopping en route at Ivythorne Manor House, a summer seat of the abbots of Glastonbury. At Street they were entertained at Mill Field to tea by Mr. W. S. Clark, J.P., C.A., and they also inspected Street Geological Museum, under the guidance of Mr. Horace Woodward, the renowned geologist and keeper of the Geological Department of the British Museum. The Museum of British Birds at Street was also inspected, and this concluded the annual meeting of 1902.

We are indebted to the *Bridgwater Independent* for the report.

### THE IRISH VALUATION SYSTEM.

A SELECT Committee of the House of Commons appointed to inquire and report what changes in the Irish Land Valuation Acts are desirable in order to enable a revaluation of rateable property in any district to be made on a basis equitable to all classes of ratepayers, and to be brought into force in an effective manner, met under the presidency of the Lord Advocate, Mr. Graham Murray, for the purpose of hearing the evidence of Sir John Barton, Commissioner for Valuation in Ireland.

Sir John Barton, who had previously furnished the committee with a statement as to the history, method and practice of valuation for rating purposes in Ireland, was examined upon it at some length by the chairman, who, passing over the "questions of historical interest such as the first and second Government valuations," desired to come more particularly to the third, or current, method of valuation. Asked how "prices" entered into the mode of valuation, witness explained, says the *Irish Times*, that they represented the average obtained for agricultural produce taken from some forty fairs in Ireland during the three years immediately preceding the passing of the Valuation Act. The reason he understood that this scale was laid down as a basis on which the land valuation was to be made was to insure uniformity. Of course the prices of agricultural produce changed a good deal, and a scale was laid down as a basis on which was calculated the valuation of every holding. The valuation of the country took a long time to complete, the last, or Griffith's valuation, occupying from 1830 until 1865.

The Chairman: When the valuer gets a certain field, say, which is capable of growing a certain crop, he is directed to value not upon the assumption that the crop will fetch the price of the day, but the price shown in the scale, and by those means you get uniformity over the country?—Yes, that is so.

But although that is given as a guide, the real criterion—the real method of valuation—depends upon the skill of the man who determines what the land would bring in in the way of certain produce?—Yes.

Under the system pertaining in Ireland there is no revaluation in the strict sense of the word?—No, not in the strict sense.

The valuation lists are delivered every year, but there is no officer charged with the duty of altering them, even if an alteration seems desirable?—My duty is to revise the lists sent to me by the rating authorities of the rateable hereditaments which they consider require revision in valuation.

I accentuate that, because when we come to the systems of other countries it is quite conceivable that you might put upon an official the duty of revaluing each year if you thought there was necessity for revaluing. The result of this obviously under the present system with respect to land is that the valuation is very much out of date.

Witness said that was so, because these valuations were

made upwards of forty years ago. He believed there was a general consensus of opinion in Ireland that a revaluation was most desirable. At present there was no power to make any alteration in the value of land, but there was some power to make alterations in the valuation of buildings.

The Chairman: Is it the case that the reason why each year there is so great a discrepancy between the proportional relations as to the valuation of lands and of hereditaments is that under statute it is not possible to alter the valuation of lands, while there is power to alter the value of other hereditaments?—That is so.

Although the valuation of land is practically stationary, the value altered considerably since the date of the last valuation?—Yes, in many districts.

Improvements, drainage and so forth will, I suppose, cause land to appreciate in value, whilst, on the other hand, you will find considerable depreciation?—Yes. Depreciation following flooding and stoppages of drains and from similar causes.

Has there been practically a difference in the alertness of the different rating bodies in various parts of Ireland on the question of bringing under the notice of the valuer possible revisions?—Yes, in some districts, but especially in towns. There has been a feeling ever since the valuation was made that where no structural changes have occurred valuation would not be revised.

Questioned on the point of railways, Sir John Barton said railways had risen in value in Ireland during the last thirty or forty years. In many cases the receipts had doubled, but no revaluation had taken place, though, perhaps, to some extent, that had been rectified in recent years. Witness, continuing, explained that bills to effect revaluation had been unsuccessfully introduced in 1865, 1873 and 1877. But in the Local Government Act, 1898, there was provision for the revaluation of six county boroughs in Ireland if the rating authorities interested asked for it and agreed to pay a portion of the cost. The only two county boroughs that had made use of that option were Belfast and Dublin. It was to the interest of the rating authority to keep the valuation high so as to admit of low rate of poundage, and as a natural consequence they obtained a large amount of rating and borrowing powers, whereas, on the other hand, it was generally the desire of the individual ratepayer to keep the valuation low. In his opinion the Irish system should continue to be a central system. Witness explained that the principal advantages of a central system were that they had values in every part of the country in exactly the same position; that they were disinterested in making the valuation high or low; the work was carried out under a set of instructions, and if they did not think those instructions covered every case they referred it at once to the Central Office, with the result that there was a uniform system of valuation throughout the whole country. Another great advantage was that they had in the Central Office tables of the original valuation of every holding, details of how it was valued, particulars of soil and subsoil, and every change made in the valuation since 1850. This system of reference was used very much by the public and by the courts.

In your view, is there any sound reason for valuing land and other hereditaments on a different basis?—I do not think so. They should be valued on the same basis. The basis of the land valuation ought to be the letting value, as was followed in both England and Scotland.

You must consider the different position of Irish land—I mean in the relations of landlord and tenant as differing from the position of land in England and Scotland?—That is so. Large amounts of rent have been fixed in Ireland by statutory tribunal.

Just tell me your view as to how you should address yourself to the problem of valuing land in Ireland, the rent of which is fixed by a statutory tribunal?

Witness said the difference between the sum which was set down as the rent of the holding if it were in the landlord's hands and the fair rent was the interest in the tenant's expenditure on improvements, such as buildings, making drains and fences. It seemed to him that in cases where the Land Commission had first named the sum the value of the holding in the landlord's hands, that sum, with some modifications, might be taken as the rateable value. He also thought that lands on which rents had not been fixed ought to be valued on practically the same basis; that was to say, in certain districts there might be half a dozen holdings. It would not be hard for a valuer to know how far land adjacent to them was of a similar quality. In that way he could arrive at an equitable valuation.

That system would be reasonably effected if you begin your valuation of Ireland with the towns, leaving the country last?—That is so. The Ordnance Survey are preparing a survey on a 25-inch scale, and they have only done a portion of it now. When that is complete it will facilitate our work, because one of the most important things in valuation is to check the boundaries of every holding.

Why in your opinion would it not do to take the fair rent a



fixed as representing the value?—For this reason. It is most desirable, in fact, necessary, that the value of houses and land should be made on the same basis. The value of land as set out in the fair-rent schedule does not include all that is rateable in the holding. It only includes one interest—the other interest is rateable, and therefore ought to be included.

The tenant's fair rent is what he has got to pay his landlord. He does not pay anything for his own property, and the idea of the tenant right is that the tenant has a certain amount of property, which is his interest in the holding.

Mr. Lough: The landlord's interest is that he gets the rental which the tenants pay, so there can be no second interest.

The Chairman: It is necessary, in your view, that in any equitable system the true basis of valuation of all hereditaments should be the same, whether they happen to be such hereditaments as can have a rent fixed for them by a statutory court or such as cannot?—Yes.

And therefore, if you take the mere fair rent as representing value, that would be an injustice to the person who has a town holding upon which the fair rent cannot be fixed by statutory tribunal?—I think so.

Witness, in further examination, expressed the view that in any system of revaluation they should begin with the towns where the most glaring inequalities existed.

Now, about the valuation of the value that is represented by licenses?—In Ireland up to the present the increased value of a license is not taken into account in arriving at a valuation.

What is your idea of the way in which the question could be dealt with?—It is that these licenses should be taken into account as in England and in Scotland. I think it is an injustice to the other ratepayers that they are not.

I think your exemption law in Ireland is in a very different state to what it is in England and Scotland?—It is. In Ireland it is held that the words "public purposes" occurring in the Valuation Acts have a much broader meaning than in England or Scotland—take, for instance, the Londonderry Bridge case—with the result that a very large amount of property is exempt in Ireland that would not be exempt in the other countries, such as the property of harbour commissioners, public offices, lunatic asylums and property of that kind. In the same way, with regard to charitable institutions, the meaning is taken in a much broader sense in Ireland, and a great many institutions are exempt there which would not be exempt here.

You think that any legislation should deal with exemptions?—Yes.

In your view, in any new valuation should the old exemption be taken away, and a new and somewhat restricted exemption be provided for?—Certainly, on public grounds, and, possibly, in regard to charities.

Would you suggest that anybody else except rate-collectors should be allowed to put cases into the lists for revaluations?—The Excise authorities should be allowed.

Would you give discretionary power to local authorities to remit valuation for a certain period upon structural works so as to encourage building improvements?—I think that would be very desirable, otherwise it might act as a deterrent to building improvements, and I would suggest that the full valuation should not be imposed until three years had elapsed after completion. The valuation might be increased by one-third in each of these years until the maximum was attained at the end of the third year.

Would you desire periodical revaluation?—Yes, every thirty years in the country and every twenty in the towns, except when the towns progress at a rapid rate, and then the rating authority should have power to ask for revaluation every ten years.

It has been suggested that a rise in the valuation would prejudicially affect Ireland in the matter of income-tax?—It would to some extent.

This concluded Sir John Barton's direct examination, and the committee adjourned until the autumn session, when he will be recalled for cross-examination. It is understood that the next witness will explain to the committee the variations in the English and Scottish systems of valuation.

## TESSERÆ.

Verrio, La Guerre and Thornhill.

WHEN the mason and carpenter and plasterer had done their work, the painters made their appearance, and covered walls and ceilings with mobs of the old divinities—nymphs who represented cities, crowned beldames for nations, and figures, ready ticketed and labelled, answering to the names of virtues. The national love of subjecting all works to a measure and value price, which had been disused while it followed nature and dealt in sentiment, was again revived, and these cold, mechanical productions might be paid for in the spirit which conceived them. The chief apostles of this

dark faith were two foreigners and one Englishman—Verrio, La Guerre and Sir James Thornhill. Rubens, indeed, and others had deviated from nature into this desert track, only to return again to human feelings with a heartier relish; but Thornhill and his companions never deviated into nature. The shepherdesses of Sir Peter Lely were loose in their attire, loose in their looks, and trailed their embroidered robes among the thorns and brambles of their pastoral scenes in a way which made the staid dames of the Puritans blush and look aside. But the mystic nymphs of Thornhill or La Guerre, though evidently spreading out all their beauties and making the most of their charms, could never move the nerves of a stoic. It is in vain that a goddess tumbles naked through a whole quarter of the sky. It is astonishing how much and how long these works were admired, and with what ardour men of education and talent praised them. Thornhill enjoys all the advantage of the praise of Pilkington, and the approbation of Lord Orford. "His genius," says the former, "was well adapted to historical and allegorical compositions. He possessed a fertile and fine invention, and sketched his thoughts with great ease, freedom and spirit. He was so eminent in many parts of his profession that he must for ever be ranked among the first painters of his time." "Sir James Thornhill," says Walpole, "a man of much note in his time, who succeeded Verrio and was the rival of La Guerre in the decorations of our palaces and public buildings, was born at Weymouth, in Dorsetshire; was knighted by George I., and was elected to represent his native town in Parliament. His chief works were the dome of St. Paul's, an apartment at Hampton Court, the altarpiece of the chapel of All Souls at Oxford, another for Weymouth, of which he made them a present; the hall at Blenheim; the chapel at Lord Orford's, at Wimpole, in Cambridgeshire; the saloon and other things for Mr. Styles, at More Park, Hertfordshire; and the great hall of Greenwich Hospital. Yet, high as his reputation was, and laborious as his works were, he was far from being generously rewarded for some of them, and for others he found it difficult to obtain the stipulated prices. His demands were contested at Greenwich, and though La Fosse received 2,000*l.* for his works at Montague House, and was allowed 500*l.* for his diet besides, Sir James could obtain but 40*s.* a square yard for the cupola of St. Paul's, and I think no more for Greenwich."

## Roman Sundials.

The first sundial with which the Romans became acquainted was, according to some writers, brought to the city by Papirius Cursor twelve years before the war with Pyrrhus, and placed before the Temple of Quirinus. Others state that it was brought to Rome at the time of the first Punic war, by the consul M. Valerius Messala, and erected on a column behind the Rostra. But this solarium being made for a different meridian did not show the time at Rome correctly. Ninety-nine years afterwards, the censor Q. Marcius Philippus erected by the side of the old solarium a new one, which was more carefully regulated according to the meridian of Rome. But as sundials, however perfect they might be, were useless when the sky was cloudy, P. Scipio Nastica, in his censorship, 159 B.C., established a public clepsydra, which indicated the hours both of day and night. This clepsydra was in aftertimes generally called solarium. The word hora for hour was introduced at Rome at the time when the Romans became acquainted with the Greek horologia, and was in this signification well known at the time of Plautus. After the time of Scipio Nastica several horologia, chiefly solaria, seem to have been erected in various public places at Rome. A magnificent horologium was erected by Augustus in the Campus Martius. It was a gnomon in the shape of an obelisk; but Pliny complains that in the course of time it had become incorrect. Another horologium stood in the Circus Flaminius. Sometimes solaria were attached to the front-side of temples and basilicæ. The old solarium which had been erected behind the Rostra seems to have existed on that spot till a very late period, and it would seem that the place was called ad Solarium, so that Cicero uses this expression as synonymous with Rostra or Forum. Horologia of various descriptions seem also to have been commonly kept by private individuals; and at the time of the emperors the wealthy Romans used to keep slaves whose special duty was to announce the hours of the day to their masters. From the number of solaria which have been discovered in modern times in Italy, we must infer that they were very generally used among the ancients.

## Proportions of Rooms.

As all roofs are supported by the side walls, and composed in general of the uniform material of wood, there is a certain though not a very precise limit which we impose to their breadth, from our knowledge that if they pass this limit they are insufficient and insecure. To the length and to the height, on the other hand, we do not impose any such rigorous limits, because neither of these proportions interfere materially with our opinion of security. Within this limit of breadth there may



be several proportions to the length and height which shall be universally pleasing. But beyond this limit these proportions cease to be pleasing and become painful in the same degree that they pass this boundary of apparent security. Thus a room of 12 feet square may constitute a pleasing form, but a room of 60 feet square would be positively disagreeable. A room 24 feet in length by 18 in breadth may be sufficiently pleasing, but a room 60 feet in length by 50 in breadth would constitute a very unpleasing form. Many other instances might easily be produced to show that the beauty of every apartment depends on the appearance of proper support to the roof; and that on this account the same proportion of breadth that is beautiful in one case becomes positively painful in others. Another cause of this difference in our opinion of the beauty of proportion arises from the character of the apartment. Everyone must have observed that the different forms of rooms, their difference of magnitude and various other causes give them distinct characters, as those of gaiety, simplicity, solemnity, grandeur, magnificence, &c. No room is ever beautiful which has not some such pleasing character. The terms by which we express this beauty are significant of these characters, and however regular the proportions of an apartment may be, if they do not correspond to the general expression, we consider the form as defective or imperfect. Thus the same proportion of height which is beautiful in a room of gaiety or cheerfulness would be felt as a defect in an apartment of which the character was severity or melancholy. The same proportion of length which is pleasing in an elegant or convenient room would be a defect in an apartment of magnificence or splendour. The great proportion of breadth which suits a temple or a senate-house, as according with the severe and solemn character of the apartment, would be positively unpleasing in any room which was expressive of cheerfulness or lightness. In proportion also as apartments differ in size different proportions become necessary in this respect, to accord with the characters which the difference of magnitude produces. The same proportion of height which is pleasing in a cheerful room would be too little for the hall of a great castle where vastness is necessary to agree with the sublimity of its character, and the same relation of breadth and height which is so wonderfully affecting in the Gothic cathedral, although at variance with all the classic rules of proportion would be both absurd and painful in the forms of any common apartment. In general it will be found that the great and positive beauty of apartments arises from their character; that where no character is discovered the generality of men express little admiration even at the most regular proportions; that every difference of character requires a correspondent difference in the composition of the dimensions, and that this demand is satisfied or a beautiful form produced only when the composition of the different proportions is such as to produce one pure and unmingled expression.

#### Miniature Painting.

It is a mistake to suppose that a miniature is more finished than an oil-picture. The miniature is inferior to the oil-picture only because it is less finished, because it cannot follow nature into so many individual and exact particulars. The proof of which is that the copy of a good portrait will always make a highly-finished miniature, whereas the copy of a good miniature, if enlarged to the size of life, will make but a very sorry portrait. Several of our best artists who are fond of painting large figures, invert this reasoning. They make the whole figure gigantic, not that they may have room for nature but for the motion of their brush (as if they were painting the side of a house), regarding the extent of canvas they have to cover as an excuse for their slovenly and hasty manner of getting over it, and thus, in fact, leave their pictures nothing at last but overgrown miniatures, but huge caricatures. It is not necessary in any case (either in a larger or smaller compass) to go into the details so as to lose sight of the effect and decompound the face into porous and transparent molecules, in the manner of Denner, who painted what he saw through a magnifying-glass. The painter's eye need not be a microscope, it should be a looking-glass, bright, clear, lucid. The little in art begins with insignificant parts, with what does not tell in connection with other parts. The true artist will paint not material points but moral qualities. In a word, wherever there is feeling or expression in a muscle or a vein, there is grandeur and refinement too.

#### GENERAL.

**The Last Coping-stone** of the Nile dam at Assouan was laid on the 30th ult. The total length is about 1½ miles; the maximum height from foundation is about 130 feet, and the total weight of the masonry is over 1,000,000 tons. It can contain over 1,000,000,000 tons of water. The work has been carried out by Sir John Aird & Co.

**M. André**, the French artist, has undertaken to restore the *Hermes* of Cythera for the sum of 20,000 francs.

**The Palace** in the Wilhelmstrasse, in Berlin, recently rendered vacant by the death of Prince George of Prussia, is to be pulled down to make room for a new palace for the German Emperor's third son, Prince Adalbert.

**M. Picard** has completed the last of the five volumes of reports on the Paris Exposition of 1900. They contain over 200 views. The copies are to be presented to the foreign Commissioners, the Consuls, and other officials.

**M. Guilbert**, the architect of the chapel in Paris erected on the site of the bazaar which was destroyed by fire, has prepared plans for a chapel adapted to the Armenian rite, for which he has received a commission from a manufacturer in Tiflis. Inspiration for it has been drawn from the church at Akhtama.

**The Members** of the Royal Society of Painters in Water-Colours presented last week to their oldest colleague, Mr. William Callow, an illuminated address of congratulation on the ninetieth anniversary of his birthday. For sixty-four years Mr. Callow has been one of their most distinguished members, and holds the unique position of never having failed to contribute his share of drawings to each exhibition during that long period.

**M. Gaston Renault**, who is an artist as well as a topographer, is preparing a plan in relief of Paris, which will be placed in the Musée Carnavalet.

**The Board of Agriculture** will shortly undertake the management and control of Kew Gardens, the duties being transferred from the Office of Works.

**Examples** of old water conduits have been revealed in laying gas mains in Finsbury Pavement. They had been hollowed out to a bore of 6 inches or 8 inches, the trees in some cases being from 4 feet to 6 feet in girth. One end of each length had been pointed to fit into the hollow of the next, some of the trees being 20 feet or more in length. They are supposed to have been laid for the waters of the New River Company, from the reservoir at Clerkenwell to Finsbury Fields.

**A Site** for a marine zoological station has been offered to the University College of North Wales by Mr. G. W. Duff Assheton Smith, of Bangor. Mr. Harold Hughes has offered to act as architect without the payment of a fee.

**The Museum of Practical Geology**, Jermyn Street, will be closed as usual from the evening of August 8 until the morning of September 10 next.

**The New Recreation Hall**, Skerries, co. Dublin, was totally destroyed by fire on Monday night. It was opened a year ago and was designed by Mr. F. Shaw, architect.

**The Arbitration** on the amount of damage caused by fire to the Birkenhead town hall has cost in expenses 826*l*. The Corporation claimed 14,403*l*, and the insurance companies offered 5,038*l*. Sir W. Emerson's award was for 8,161*l*.

**The Poll** of the trustees of the Manchester Infirmary as to whether the new buildings should be erected on the site in Piccadilly has produced the following result:—For 199, against 550, thus confirming a previous resolution.

**Mr. Robert Pepys Cockerell** died in Liverpool on Wednesday last in his thirty-second year. He was the eldest son of the late Frederick Pepys Cockerell, and grandson of Professor Cockerell, R.A.

**The Art Congress at Bruges**, which is to be held in connection with the Exposition des Primitifs Flamands at Bruges, will take place between the 10th and the 14th inst. The subjects discussed will include archaeology, history and art.

**The Text** of the final order of the Court of King's Bench on the position of district surveyors as regards wooden stands and other structures is as follows:—Upon reading the questions submitted for the decision of this Court, under section 29 of the London Government Act, 1899, in the form of a special case agreed on between the parties, and upon hearing Mr. Manisty, of counsel for the Mayor, alderman and councillors of the city of Westminster and Mr. Macmorran, of counsel for Thomas Henry Watson, William Alfred Large, Robert Kerr, Edward Dru. Drury, Charles Foster Hayward, Alfred Williams and William Hewson Lees, district surveyors, acting under the London Building Acts, within the said city. This Court doth decide the said questions as follows videlicet:—(1) The powers, duties and liabilities of the district surveyors with respect to the supervision or inspection of wooden structures, falling under Section 84 of the London Building Act, have not been transferred to the City Council and its officers, but the district surveyors have no powers, duties or liabilities under the licenses granted by the City Council. (2) Wooden structures falling within the said Section 84 are works of which the district surveyors should have notice under Section 145 of the said Act in a proper case. (3) The right to receive the fees for such supervision and inspection, specified in paragraph 15 of the said special case, has not lapsed nor has it been transferred to the City Council or its officers.









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NEW PREMISES, TRURO.

SILVANUS TREVAIL, P.S.A., Architect.







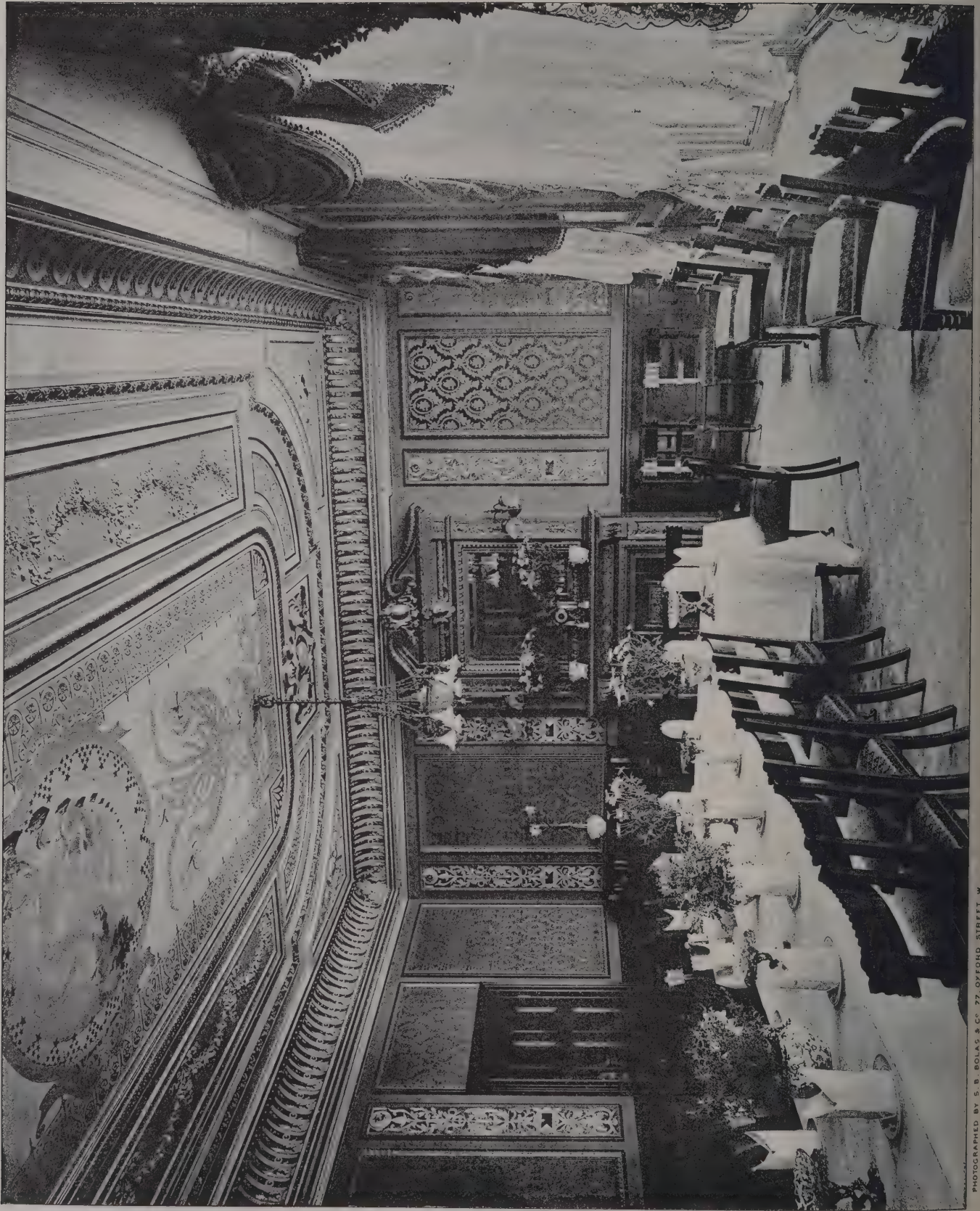








The Architect, Aug 8<sup>th</sup> 1902.



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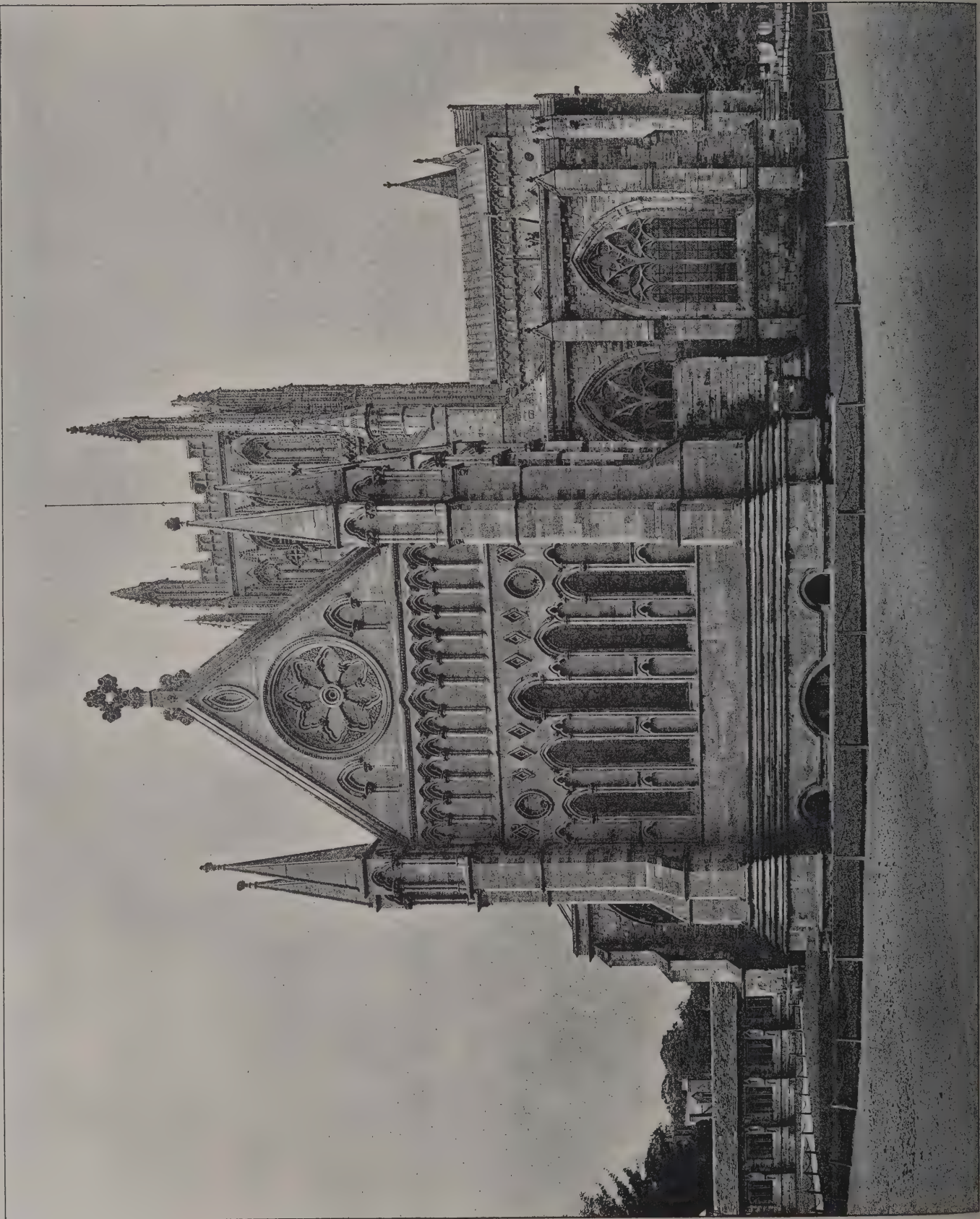
SMALL DINING ROOM: QUEEN'S HOTEL LEICESTER SQUARE.

PHOTOGRAPHED BY S. B. BOLAS & CO. 77, OXFORD STREET, W.





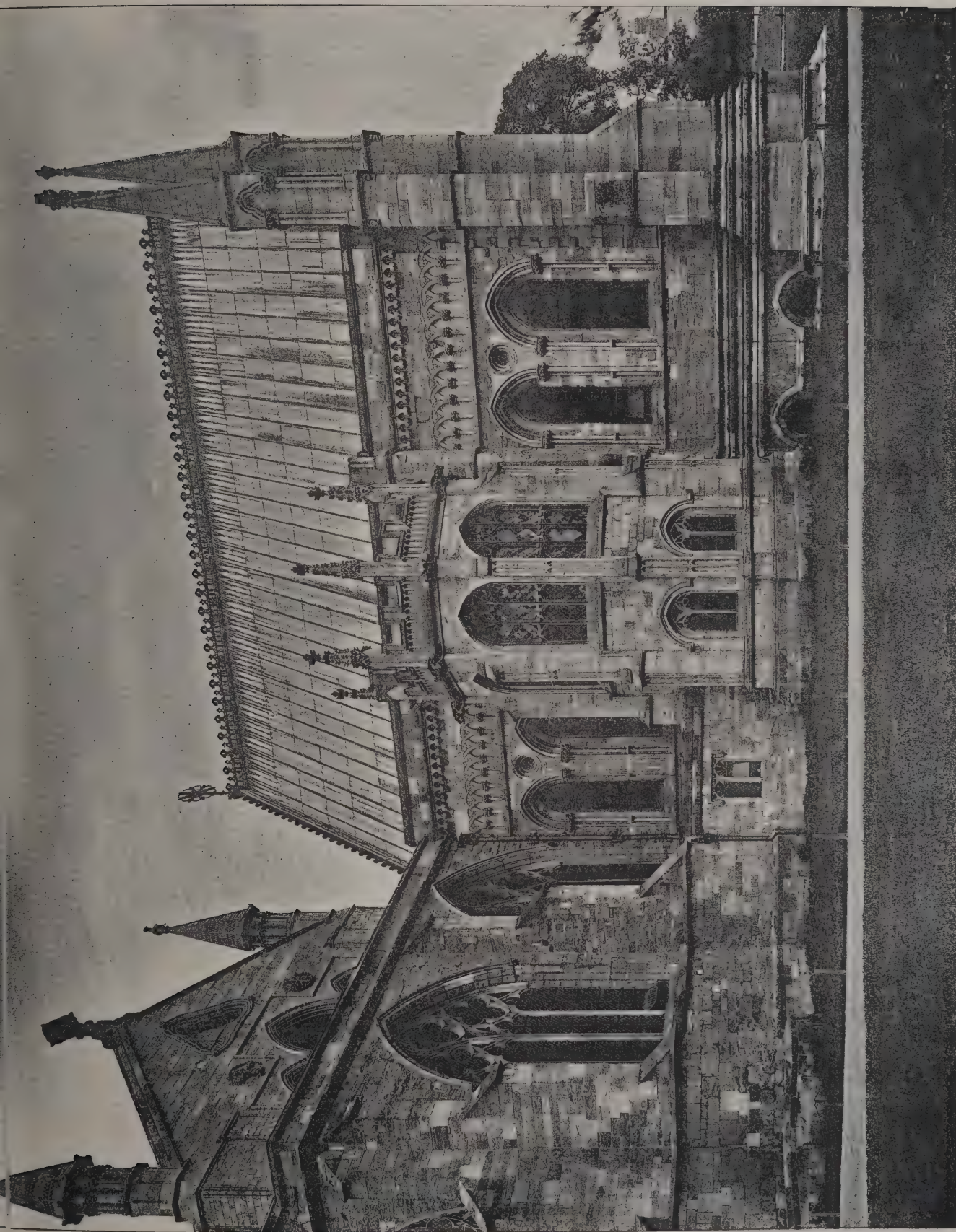




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CATHEDRAL SERIES, No. 402.—HEREFORD: SOUTH SIDE OF LADY CHAPEL.







The Architect, Aug 8<sup>th</sup> 1902.



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TABLE D'HOTE ROOM: QUEEN'S HOTEL, LEICESTER SQUARE.

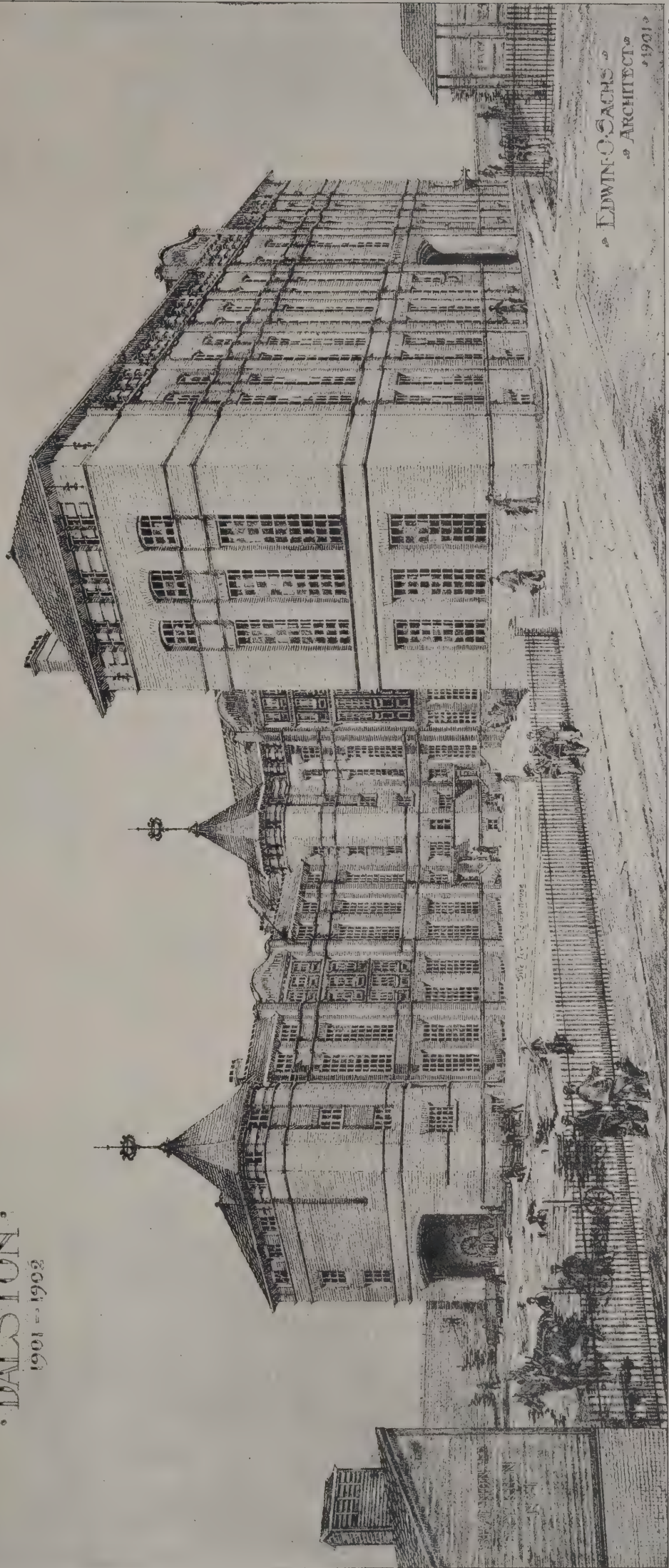
Messrs. SAVILLE & MARTIN, Architects.







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THE

## Architect and Contract Reporter.

## EDITORIAL NOTICES.

*In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

## TENDERS, ETC.

*\*\* As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

## COMPETITIONS OPEN.

**BERMONDSEY.**—Sept. 16.—Designs are invited for artisans dwellings to be erected on land at Rotherhithe, within the borough of Bermondsey, and known as the Fulford Street area. Premiums of 100*l.*, 60*l.* and 40*l.* will be awarded. Mr. Fredk. Ryall, town clerk, Town Hall, Spa Road, S.E.

**BIDEFORD.**—Sept. 25.—The Town Council of Bideford are about to erect municipal offices and a public library upon a site opposite the west end of the Long Bridge, Bideford, and they invite designs for the proposed buildings. Premiums of 30*l.*, 15*l.* and 10*l.* respectively are offered for the designs which shall be placed by the Council first, second and third in order of merit. Designs and descriptions, &c., are to be delivered to Mr. Wm. B. Seldon, town clerk, 18 The Quay, Bideford.

**DEPTFORD.**—Aug. 30.—Competitive designs are invited for a town hall and municipal offices. Premiums of 100*l.*, 75*l.* and 50*l.* are offered for the three selected designs. Mr. Vivian Orchard, town clerk, Municipal Offices, 20 Tanner's Hill, Deptford S.E.

**INDIA.**—Nov. 1.—Competitive designs are invited for the erection of a memorial to Her Majesty the late Queen Victoria at Allahabad. A premium of 2,000 rupees will be awarded to the design selected by the committee. Mr. H. Nelson Wright, Indian Civil Service, honorary secretary, Queen Victoria Memorial Fund Committee, Allahabad, India.

**LIVERPOOL.**—Sept. 15.—Designs are invited for new labourers' dwellings to accommodate about 2,500 persons, to be erected on the Hornby Street area. Premiums of 250*l.*, 150*l.* and 100*l.* respectively are offered for the first three selected designs. Particulars will be supplied by the Town Clerk.

**MAIDENHEAD.**—Oct. 1.—Designs for free library. Premiums offered of £50, £20 and £10 respectively. Mr. John Kirk, town clerk, Guildhall, Maidenhead.

**SOUTHEND.**—Sept. 7.—Designs are invited for a church to accommodate 500 persons, a clergy-house, and a parochial hall or parish-room about 50 feet by 30 feet. Mr. C. H. J. Talmage, Kathleen Villa, Southchurch Road, Southend-on-Sea.

**SUNDERLAND.**—Aug. 30.—Designs are invited for proposed police and fire-brigade buildings to be erected in Gill Bridge Avenue and Dun Cow Street. Premiums of 100*l.*, 50*l.* and 25*l.* are offered for first, second and third designs respectively. Mr. Fras. M. Bowey, town clerk, Town Hall, Sunderland.

**WALES.**—The Barry Urban District Council offer premiums of 150*l.*, 100*l.* and 50*l.* for first, second and third best designs respectively for proposed municipal buildings and public library on a site in the centre of the town. Mr. J. C. Pardoe, surveyor, District Council Office, Barry.

## CONTRACTS OPEN.

**ANDOVER.**—Aug. 14.—For erection of a steel girder and concrete bridge at Amport, and the laying of three cast-iron drains under the Andover and Amesbury main road, Andover. Mr. John Wormald, district surveyor, South Cottage, Andover.

**ASTON.**—Aug. 11.—For covering three boilers with about 800 yards of steam tubing at the workhouse, Gravelly Hill, near Birmingham. Mr. John North, clerk to the Guardians, Union Offices, Vauxhall Road, Birmingham.

**BARNES.**—Aug. 14.—For erection of a new infants' school for 350 children in Railway Street, Barnes. Mr. C. Innes, architect, 50 Cannon Street, E.C.

**BARROW-IN-FURNESS.**—Aug. 13.—For erection of buildings for an extension of the manufacturing plant at the gasworks, for the Corporation. The Manager of the Gas and Water-works.

**BILLERICAY.**—Aug. 12.—For sewerage works and the laying-out of about 2½ acres of land for sewerage and sewage disposal at Brook Street, near Brentwood. Mr. J. Simmons, engineer, Bank Chambers, Doncaster.

**BISHOP AUCKLAND.**—Aug. 11.—For alterations and additions to manager's house, colliery offices, stabling, &c., at Chilton Colliery. Mr. F. H. Livesay, architect, Bishop Auckland.

**BISHOP'S STORTFORD.**—Aug. 11.—For erecting boundary-wall 600 feet in length by 8 feet high at the gasworks. Mr. W. J. Gee, secretary, Water Lane, Bishop's Stortford.

**BOOTLE.**—Aug. 13.—For erection of a gymnasium floor over the gentlemen's swimming-bath, Balliol Road, Bootle, Lancs. Particulars may be obtained at the Borough Engineer's Office.

**BOSFRANKAN.**—Aug. 19.—For erection of a stable and wainhouse, &c., at Bosfrankan, Cornwall. Mr. George Gow, Tregothnan Office, Truro.

**BRIDGWATER.**—Aug. 11.—For construction of about 188 yards of new sewer with manholes, and the construction of

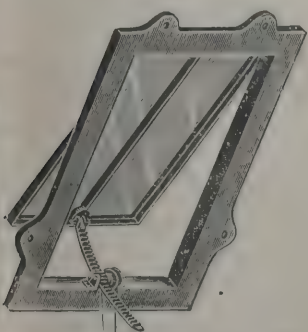


Fig. 9.

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bacteria beds for sewage-disposal works at Westonzoiland Mr. W. A. Collins, engineer, 120 West Street, Bridgwater.

BRISTOL.—For erection at Stapleton of an infirmary to hold 875 sick inmates. Mr. H. Percy Adams, architect, 26 Woburn Place, W.C.

BRISTOL.—Aug. 21.—For construction of foundations, culverts, subways, &c., at the Avonbank electricity works. Mr. H. Faraday Proctor, city electrical engineer, Temple Back, Bristol.

BROMPTON.—Aug. 11.—For extension of weaving-shed premises at Brompton, near Northallerton, Yorks. Messrs. T. Winn & Sons, architects, 92 Albion Street, Leeds.

BURNHAM-ON-CROUCH.—Aug. 25.—For erection of an engine-house at the waterworks, Burnham-on-Crouch. Mr. E. Dillway, High Street, Burnham-on-Crouch.

CARLISLE.—For alterations to premises in the Crescent. Messrs. Johnstone Bros., architects, &c., 39 Lowther Street, Carlisle.

CHACEWATER.—Aug. 12.—For additions and alterations at Chacewater and Scorrer stations, for the Great Western Railway Company. Mr. G. K. Mills, secretary, Paddington Station.

CHESTERFIELD.—Aug. 11.—For erection of infirmary, nurses' home, laundry and other works at the workhouse, Newbold Road, Chesterfield. Messrs. Rollinson & Son, architects, 13 Corporation Street, Chesterfield.

COLCHESTER.—Aug. 23.—For altering pumps at the waterworks, Balkeine Hill. Mr. C. E. Bland, waterworks superintendent, Town Hall.

CREWE.—Aug. 14.—For enlargement of the master's house in Broad Street. Mr. J. A. Atkinson, architect, Hightown, Crewe.

EARLS BARTON.—Aug. 16.—For construction of a storage reservoir near Earls Barton, Northampton, with outlet works, basin, filters, clear-water tank, waste weir, by-wash, &c. Mr. Geo. S. Mason, clerk to the District Board, Rushden, R.S.O., Northamptonshire.

EASINGWOLD.—Aug. 12.—For supply and fixing of steam cooking apparatus, &c., at the union workhouse. Mr. F. J. H. Robinson, clerk to Guardians, Easingwold.

EBBW VALE.—Aug. 11.—For erection of a coach-house and stable at Hill Side House, Ebbw Vale. Particulars may be obtained at the House Agent's Office, Ebbw Vale.

GLASGOW.—Aug. 12.—For supply and erection of two mild-steel circular tar tanks for Provan chemical works. Mr. W. Foulis, gas engineer, 45 John Street, Glasgow.

GLASGOW.—Aug. 20.—For supply of two Lancashire boilers with accessories, laundry machinery and hot and cold water service, heating apparatus, &c., at the Eastern District Hospital, Duke Street. Mr. Jas. R. Motion, Parish Council Chambers, 38 Cochrane Street, Glasgow.

GLEDHOW.—For erection of two through houses, Jackson's Avenue, Gledhow. Mr. Whitworth, Jackson's Avenue.

GLOUCESTER.—Aug. 28.—For erection of a nurses' home at the Gloucester infirmary. Messrs. Waller & Son, architects, 17 College Green, Gloucester.

GRAYS.—Aug. 12.—For erection of a club in London Road, Grays. Mr. R. Rider, The Club, Maidstone Road, Grays.

GRIMSBY.—Aug. 26.—For piling, timbering and concreting at the Alderman Dobson school. Mr. H. C. Scaping, architect, Court Chambers, Grimsby.

HACKNEY.—Sept. 11.—For erection of coal stores. Mr. George Grocott, town clerk, Town Hall, Hackney.

HALIFAX.—Aug. 13.—For erection of stabling at the Albion Brewery. Messrs. Jackson & Fox, architects, 7 Rawson Street, Halifax.

HARROGATE.—Aug. 13.—For additions, alterations and roof over town's yard at Robert Street. Mr. F. Bagshaw, borough surveyor, Municipal Offices, Harrogate.

HOLMFIELD.—Aug. 11.—For erection of three houses and a shop at Holmfild. Messrs. Petty & Ives, architects, 12 Waterhouse Street, Halifax.

HONITON.—Aug. 27.—For construction of an open concrete storage reservoir, having a capacity of 1,500,000 gallons, filter-beds and covered service reservoir, together with pipes, sluice and air valves, hydrants, &c. Messrs. Beesley, Son & Nichols, engineers, 11 Victoria Street, Westminster, S.W.

ILFRACOMBE.—Aug. 20.—For construction of masonry intakes in the parish of Challowcombe, laying cast-iron pipes, &c., in connection with the new gravitation main from Challowcombe to Ilfracombe. Mr. O. M. Prouse, engineer, Town Hall, Ilfracombe.

ILKESTON AND HEANOR.—Aug. 21.—For construction of a covered service reservoir, holding 800,000 gallons, at Ilkeston, a covered service reservoir, holding 440,000 gallons, at Codnor, and for the provision and laying of a gravitation

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main from Chadwick Nick reservoir through Heanor to Ilkeston. Mr. Wright Lissett, town clerk, Ilkeston.

IPSWICH.—Aug. 12.—For erection of a new Inland Revenue office at Ipswich, for the Commissioners of H.M. Works and Public Buildings. Messrs. H. Gritten & Son, 8 Princes Street, Westminster.

IPSWICH.—Aug. 27.—For erection of generating station, offices, car-shed, chimney-shaft and destructor buildings in Constantine Road, Ipswich. Mr. Will Bantoft, town clerk, Town Hall, Ipswich.

IRELAND.—Aug. 12.—For erection of a Crown post office and postmaster's residence at Cahir, co. Tipperary. Plans and specification can be seen at the Post Office, Clonmel, and at the Office of Public Works, Dublin.

IRELAND.—Aug. 15.—For erection of new college, Mullingar, co. Westmeath. Mr. J. J. O'Callaghan, architect, 16 Nassau Street, Dublin.

IRELAND.—Aug. 16.—For sinking well at Aghern, Fermoy. Mr. Peter O'Neill, clerk, R D C, Workhouse

IRELAND.—Aug. 20.—For erection of semi-detached villa residence at Rostrevor, co. Down. Mr. W. James Watson, architect, Rostrevor.

JARROW-ON-TYNE.—Aug. 15.—For erection of ore, coke and limestone depôts in connection with the blast furnaces at Jarrow-on-Tyne. Particulars obtained at the offices of the Rolling Mills and Blast Furnaces Departments, Jarrow.

LEEDS.—Aug. 11.—For painting, decorating, &c., various rooms, offices, staircases and corridors in the municipal buildings, Leeds. The City Engineer, Leeds.

LEEDS.—For erection of the superstructure of a warehouse. Messrs. W. Evan Jones, Perkin & Bulmer, architects, 7 Cookridge Street, Leeds.

LIVERSEDGE.—Aug. 17.—For erection of a car-shed, repair shops, offices and accessories at Frost Hill car depôt, Liversedge, Yorks. The Architect, British Electric Traction Co., Ltd., 1 Adelphi Terrace, Strand, W.C.

LONDON.—Aug. 15.—For repainting and tar-varnishing Chelsea suspension bridge over the river Thames. Particulars of the Engineer's Department, County Hall, Spring Gardens, S.W.

MACCLESFIELD.—Aug. 14.—For alterations at Macclesfield certified industrial school. Mr. Jabez Wright, architect, Macclesfield.

MACCLESFIELD.—Aug. 16.—For additions and extensions to farm buildings at the Parkside Asylum. Mr. H. Beswick, county architect, Newgate Street, Chester.

MALVERN.—Aug. 23.—For supply of two Lancashire boilers (with feed-water heater and pipework), engines, alternators, exciters and switchboard, high and low-tension concentric cables and transformers. Mr. H. P. Maybury, surveyor, Council House, Malvern.

MANCHESTER.—Aug. 11.—For putting-in the foundations for coke-storing plant at the Gaythorn gas station. Mr. C. Nickson, superintendent, Gas Department, Town Hall, Manchester.

MANCHESTER.—Aug. 11.—For erection of an electricity sub-station at Newton Heath. Particulars may be obtained at the office of the City Architect, Town Hall.

MANCHESTER.—Aug. 12.—For tiling of the floors and walls of the males' first-class wash baths at New Islington, for the baths and wash-house committee. The Chairman of the Baths, &c., Committee, Osborn Street, Manchester.

MANCHESTER.—Aug. 12.—For alterations to the males' first-class wash baths at New Islington. The Chairman of the Baths, &c., Committee, Osborn Street, Manchester.

MANCHESTER.—Aug. 14.—For erection of three shelters at Monsall fever hospital. Particulars may be obtained at the office of the City Architect, Town Hall.

MORESBY.—Aug. 11.—For erection of a pair of semi-detached houses at Mill Grove, Moresby. Mr. J. S. Moffat, architect, 53 Church Street, Whitehaven.

NEWCASTLE-ON-TYNE.—Aug. 30.—For erection of offices, &c., in Pilgrim Street, Newcastle-on-Tyne. Mr. Henry Holliday, Consett Iron Co., Consett.

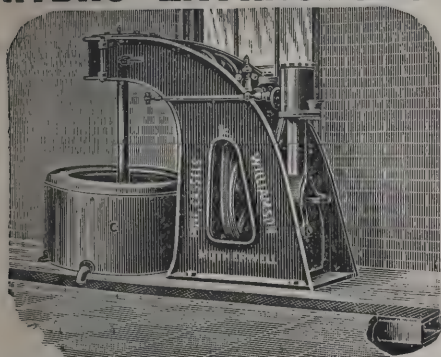
OSSETT.—Aug. 11.—For taking-down and rebuilding a house at Hagg's Hill, Ossett, Yorks. Messrs. C. H. Marriot, Son & Shaw, Church Street Chambers, Dewsbury.

PLYMOUTH.—Aug. 23.—For overhead line construction in connection with the tramways. Mr. E. G. Okell, borough electrical engineer, Prince Rock, Plymouth.

RETFORD.—For laying about 300 superficial yards of wood block flooring at the Retford town hall. Mr. J. D. Kennedy, borough surveyor, Retford.

RUGBY.—Aug. 13.—For repairs, cleaning, colouring, &c., at the old Council Chamber, Windmill Lane, Rugby. Mr. D. G. Macdonald, surveyor, Rugby.

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**SCOTLAND.**—For addition to Castlebay public school, to accommodate seventy scholars, and addition to Northbay public school, to accommodate fifty scholars, in the island of Barra. Mr. Andrew M'Elfrish, clerk to the School Board, Lochmaddy.

**SCOTLAND.**—Aug. 11.—For erection of an infant school at Glencraig, Lockgelly. Mr. William Birrell, architect, 200 High Street, Kirkcaldy.

**SCOTLAND.**—Aug. 12.—For laying cast-iron and fireclay pipes, constructing collecting reservoirs, gathering wells and other works in connection with extensions of the Cults water-supply works, Aberdeen. Messrs. Walker & Duncan, 3 Golden Square, Aberdeen.

**SCOTLAND.**—Aug. 13.—For erection of a dwelling-house, College Bounds, Fraserburgh. Mr. Wm. S. F. Wilson, architect, Fraserburgh.

**SCOTLAND.**—Aug. 13.—For additions to Kelty infant school. Mr. John Houston, architect, Dunfermline.

**SCOTLAND.**—Aug. 15.—For construction of a 7-inch cast-iron outfall sewer, about 220 yards in length, with cement concrete supporting wall, &c., from the Dreel Bridge, Anstruther, to the sea. Messrs. Jamieson & Guthrie, town clerks, Anstruther.

**SOWERBY.**—Aug. 12.—For erection of new offices in Sowerby Bridge, Yorks. Mr. S. Wilkinson, architect, Sowerby Bridge.

**STREATHAM.**—Aug. 14.—For erection of a fire-brigade station. Particulars at the Architect's Department, L.C.C. Fire Brigade Branch, 3 Warwick Street, Charing Cross, S.W.

**SWINDON.**—Aug. 25.—For extensions to the technical school, Victoria Road. Messrs. Bishop & Pritchett, architects, Regent Circus, Swindon.

**TYWARDREATH.**—Aug. 11.—For erection of a Board school and out-offices, with boundary walls, &c. Mr. William Julian Samble, architect, Hill House, Par Station, Cornwall.

**WALES.**—For alterations and additions to the Station hotel, Abertillery. Mr. Thomas Roderick, architect, Clifton Street, Aberdare.

**WALES.**—For boring at the Caradog Vale Colliery, Hendreforgan, and at the Groeswen Colliery, Nantgarw. The Groeswen and Caradog Collieries, Ltd., 49 Queen Victoria Street, London, E.C.

**WALES.**—Aug. 12.—For erection of an office at Swansea (High Street) station, for the Great Western Railway Co. Mr. G. K. Mills, secretary, Paddington Station, W.

**WALES.**—Aug. 13.—For erection of a villa near Crumlin, Mon. Mr. R. L. Roberts, architect, Crumlin.

**WALES.**—Aug. 14.—For erection of twenty houses at Cefn Cribbwr, near Bridgend. Messrs. J. & F. J. Hurley, architects, 10 Bridgend Road, Tondy, Aberkenfig.

**WALES.**—Aug. 14.—For erection of ten workmen's dwelling-houses at Fleur-de-Lis, Mon. Mr. Geo. Kenshole, architect, Station Road, Bargoed.

**WALES.**—Aug. 15.—For erection of an electric-power station and car-sheds, Pontypridd. Mr. C. Sidney Watson, Council Offices, Town Hall, Pontypridd.

**WALES.**—Aug. 16.—For erection of a house in Manor Road, Abersychan. Mr. T. B. Winstone, 16 High Street, Abersychan.

**WALES.**—Aug. 18.—For erection of a large hotel, with stables, &c., Jubilee Road, Aberaman. Messrs. Llewellyn Smith & Davies, architects, &c., Aberdare.

**WALES.**—Aug. 18.—For erection of a stone arched bridge, or, in the alternative, of an iron girder bridge, at the Pitt, Llanarth; and for erection of a stone retaining wall to the bridge at Hendre Glyn, Llanover, Abergavenny. Mr. John Gill, surveyor, 4 Brecon Road, Abergavenny.

**WALES.**—Aug. 18.—For construction of basements and foundations and other works for the proposed new lunatic asylum at Whitchurch, near Cardiff. Messrs. Oatley & Skinner, architects, Edinburgh Chambers, Baldwin Street, Bristol.

**WALES.**—Aug. 27.—For erection of a lunatic asylum at Caerleon, Mon. Mr. A. J. Wood, architect, 22 Surrey Street, Victoria Embankment, W.C.

**WALSALL.**—Sept. 8.—For erection of a school to accommodate 1,000 children and a caretaker's house at North Walsall. Mr. H. E. Lavender, architect, Bridge Street, Walsall.

**WILLINGTON.**—Aug. 14.—For erection of Catholic church and presbytery, Willington, Durham. Mr. John Kelly, architect, 466 Oxford Street, Marble Arch, W.

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WOLVERHAMPTON—Aug. 13.—For a complete electric-light installation at the new workhouse (accommodation 1,400). Mr. Arthur Marshall, King Street, Nottingham.

WOODFORD.—Aug. 9.—For erection of school buildings in Snakes Lane, Woodford, Essex. Mr. Edward Tidman, architect, Victoria Street, Westminster, S.W.

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### ASTON MANOR.

For construction of a 21-inch diameter storm-water culvert across the Aston Unity cricket ground, near Trinity Road. Mr. G. H. JACK, surveyor.

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J. White, jun. . . . .	240	0	0
J. MACKAY, Smethwick (accepted) . . . . .	233	9	3

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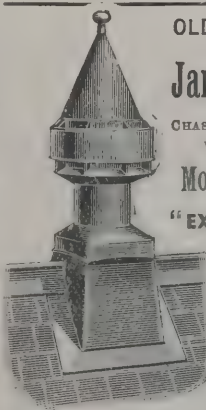
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T. Adams . . . . .	£2,048	7	10
Lawrence & Thacker . . . . .	1,941	1	2
Free & Sons . . . . .	1,929	0	0
Wilson, Border & Co. . . . .	1,868	6	5
R. Ballard, Ltd. . . . .	1,827	7	8
A. H. Wheeler . . . . .	1,763	11	11
ROAD MAINTENANCE CO., Gravesend (accepted) . . . . .	1,770	3	0

**GREAT YARMOUTH.**

For erection of a boundary wall at the Hollies, Gorleston. Mr. W. WALTER LAKE, architect, Regent Street, Great Yarmouth.

Bland . . . . .	£55	4	0
Dawson . . . . .	48	3	0
Bond . . . . .	47	0	0
Beech . . . . .	45	19	9
Easto . . . . .	45	5	0
Pestell . . . . .	39	10	0

For erection of fishing premises on the South Denes, Fraserburgh. Mr. W. WALTER LAKE, architect, Regent Street, Great Yarmouth.

Moore & Sons, bricklayer and carpenter . . . . .	£992	0	0
Lake & Burrell, plumber . . . . .	44	15	6

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GREAT YARMOUTH—continued.

For erection of fishing premises on the South Denes. Mr. W. WALTER LAKE, architect, Regent Street, Great Yarmouth.		
Beech, bricklayer	£1,014	0 0
Wright, carpenter	495	0 0
Great Yarmouth Ironworks Co	185	10 0
Andrews, plumber	52	0 0

GLASS HOUGHTON.

For renovation of Primitive Methodist chapel, Glass Houghton, Yorks.		
G. Drinkwater	£42	10 0
W. Lawrence	40	0 0
H. BUTLER, Corn Market, Pontefract (accepted)	21	0 0

GUILDFORD.

For painting and repairs to the Corporation cottages, Castle Street and South Street. Mr. C. G. MASON, surveyor, Tuns Gate, Guildford.		
W. F. Wootton	£148	15 0
C. G. Fowler	141	10 6
A. Franks	138	19 6
G. Shires	135	10 0
G. W. Blizzard	129	17 6
D. COKER, South Street (accepted)	95	15 9

HACKNEY.

For street works in Heatherley Street (southern portion). Mr. NORMAN SCORGIE, borough surveyor.		
Grounds & Newton	£632	1 7
C. W. Killingback & Co.	578	3 6
W. Griffiths & Co., Ltd.	563	17 10
W. Gibbs, Ltd.	556	5 11
G. PORTER, 2 Arthur Street, Well Street, Hackney, N.E. (accepted)	553	7 0
For supply and delivery of a 10-ton compound road roller. Mr. N. SCORGIE, borough engineer.		
J. Fowler & Co., Ltd.	£450	0 0
Marshall's, Sons & Co., Ltd.	391	10 0
T. Green & Sons	390	0 0
R. Garrett & Sons	390	0 0
C. Burrell & Sons	390	0 0
Clayton & Shuttleworth, Ltd.	381	0 0
AVELING & PORTER, LTD., Rochester (accepted)	370	0 0

HAMPSTEAD HEATH.

For erection of two houses on the site of the old Vale of Health tavern. Messrs. LOWE & GOLDSCHMIDT, Heath Street, Hampstead, and A. W. HUDSON, 87 Finsbury Pavement, E.C., architects.		
J & W. T. Inkpen	£2,199	0 0
W. J. King	1,936	10 0
Sheffield Bros.	1,797	0 0
Dabbs & Son	1,480	0 0
A Collins	1,175	0 0

HARWICH.

For street works in Stour Road, Dovercourt. Mr. HENRY DITCHAM, borough surveyor.		
--	--	--

Contract No. 1.

Smith & Beaumont	£808	0 0
F. Bennett	805	0 0
E. Newton	783	12 8
Bradshaw & Co.	738	4 6
J. Trueman	720	0 0
WILSON, BORDER & Co., Ilford (accepted)	702	0 0

Contract No. 2.

E. Newton	1,098	0 0
F. Bennett	1,087	0 0
Smith & Beaumont	1,046	0 0
Bradshaw & Co.	1,009	0 0
J. Trueman	960	0 0
WILSON, BORDER & Co (accepted)	936	0 0

HASTINGS.

For erection of a technical school in Tower Road. Mr. A. W. JEFFERY, architect, 5 Havelock Road, Hastings.		
--	--	--

J. Harvey	£2,850	0 0
A. H. White	2,525	0 0
Tapner, Simmonds & Co.	2,520	0 0
J. Parker	2,477	0 0
T. T. Denne	2,472	0 0
Padgham & Hutchinson	2,454	0 0
J. LESTER, Earl Street, Hastings (accepted)	2,447	0 0
H. E. Crutenden	2,438	0 0
W. & E. Noakes	2,344	0 0
Gann & Co.	2,295	0 0

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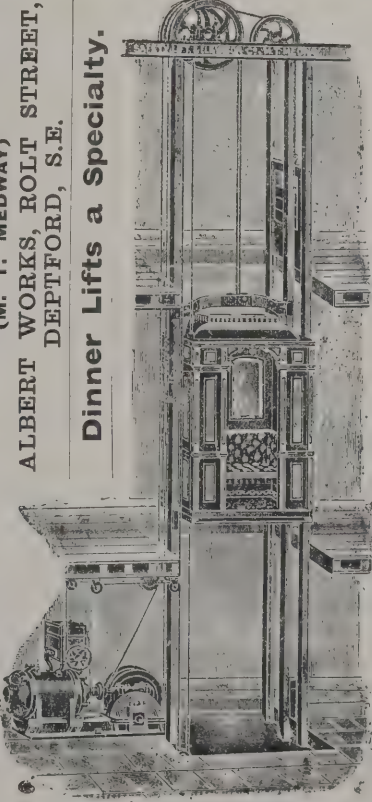
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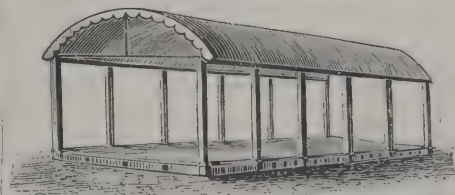
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**HEDNESFORD.**

For erection of an infant school in Station Road.

M. B. ANDERSON, Cannock (*accepted*) . . . £2,440 0 0**HENDON.**

For street works at Milton Road, Finchley Lane, Hermitage Lane and Colin Deep Lane. Mr. S. SLATER GRIMLEY, surveyor.

Milton Road.  
R. BALLARD, LTD, Child's Hill (*accepted*) . . . £997 0 10Finchley Lane.  
R. BALLARD, LTD. (*accepted*) . . . . . 408 0 0Hermitage Lane.  
R. BALLARD, LTD. (*accepted*) . . . . . 118 4 4Colin Deep Lane.  
R. BALLARD, LTD. (*accepted*) . . . . . 234 6 3**HERTS.**

For erection of a beerhouse and cottage, Symonds Green, Herts. Mr. J. RANDALL VINING, architect, 89 Chancery Lane, London, W.C.

A. Black &amp; Son . . . . . £925 0 0

J. &amp; C. Bowyer . . . . . 825 0 0

J. H. Aldridge . . . . . 739 0 0

S. Redhouse, sen. . . . . 700 0 0

W. J. Spratt . . . . . 697 0 0

F. Newton . . . . . 692 0 0

J. WILLMOTT & SONS, Hitchin (*accepted*) . . . 690 0 0**HORWICH.**

For erection of infectious diseases hospital.

J. Edmundson &amp; Co. . . . . £15,786 0 0

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R. Carlyle . . . . . 13,469 0 0

W. J. SLATER, Horwich (*accepted*) . . . . . 13,235 15 4**LANCHESTER.**

For construction and alteration of the Derwent cottages sewage-disposal works. Mr. G. W. WESTGARTH, surveyor.

J. ATKINSON, Knitsley, co. Durham (*accepted*) . £146 3 2**LEYTON.**

For street works in the district. Mr. WILLIAM DAWSON, surveyor.

T. Adams . . . . . £13,844 0 0

G. Porter . . . . . 13,590 0 0

Meston &amp; Hale . . . . . 12,838 0 0

W. Griffiths &amp; Co. . . . . 12,774 0 0

G. Wilson . . . . . 12,578 0 0

F. J. Coxhead . . . . . 12,255 0 0

W. Manders . . . . . 11,800 0 0

G. J. Anderson . . . . . 11,768 0 0

A. W. PORTER, Leyton (*accepted*) . . . . . 11,710 0 0**LONDON.**

For rebuilding shop and premises, 10 Brompton Road, S.W. Messrs. BLANGY &amp; VAN BAARS, architects, 12 Southampton Buildings, W.C.

Leslie &amp; Co. . . . . £2,860 0 0

Langdale &amp; Hallett . . . . . 2,700 0 0

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Adamson &amp; Sons . . . . . 2,290 0 0

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SYME & DUNCAN (*accepted*) . . . . . 2,250 0 0

For supply and fixing of laundry machinery and plant at the Joyce Green Hospital. Messrs. TREADWELL &amp; MARTIN, architects.

Manlove, Elliott &amp; Co., Ltd. . . . . £9,360 11 0

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## LONDON—continued.

For sanitary work and for painting and cleaning works at the Banstead Road school.

## Sanitary work.

Gardner & Hazell	£6,136	10	0
W. Rogers	6,076	0	0
D. Gibb & Co.	5,610	0	0
E. Proctor	5,500	0	0
G. Jackson	5,462	7	0
G. H. James	5,429	2	3
Haslemere Builders, Ltd.	5,374	0	0
Staines & Son	5,300	0	0
J. Knight & Sons	5,203	0	0
H. Rogers	5,200	0	0
J. B. Potter	5,127	0	0
A. H. Inns	4,982	15	6
H. Line	4,760	0	0
M. Batchelor	4,750	0	0
T. COLE, 125 Offord Road, N. (accepted)	4,666	17	10

## Painting and cleaning works.

G. Jackson	3,732	17	7
H. Rogers	3,720	0	0
Haslemere Builders, Ltd.	3,492	0	0
Gardner & Hazell	2,793	10	0
G. H. James	2,789	16	8
J. B. Potter	2,766	0	0
J. Knight & Sons	2,609	0	0
Staines & Son	2,390	0	0
D. Gibb & Co.	2,356	0	0
E. Proctor	2,050	0	0
H. Line	2,024	0	0
M. Batchelor	2,008	0	0
A. H. Inns	1,920	7	0
T. Cole	1,924	12	4
W. Rogers	1,785	0	0

For erection of a woman's refuge at Tufton Street. Mr. H. PERCY ADAMS, architect. Quantities by Mr. S. G. THACKER.

Kerridge & Shaw	£4,630	0	0
Higgs & Hill	4,124	0	0
Prestige & Co.	3,947	0	0
W. King & Co.	3,739	0	0
GOUGH & Co. (accepted)	3,534	0	0

## LONDON—continued.

For internal and external decorative repairs to the Champion Hill infirmary, East Dulwich Grove.

J. J. RICHARDS (accepted) . . . . . £957 0 0

For erection of the Southern Hospital. Messrs. TREADWELL & MARTIN, architects.

F. & H. F. Higgs	£214,000	0	0
C. Wall	201,328	0	0
Rudd & Son	201,214	10	7
W. Wallis	201,139	10	0
W. H. Lorden & Son	198,888	0	0
W. Wilcocks & Son	198,873	0	0
Patman & Fotheringham, Ltd.	197,723	0	0
J. & M. Patrick	197,299	0	0
Kirk & Randall	193,203	0	0
J. Shillitoe & Son	193,000	0	0
F. G. Minter	191,000	0	0
Holliday & Greenwood	184,444	0	0
McCormick & Sons	179,777	0	0
W. Johnson & Co., Ltd., Bellevue Road, Wandsworth Common, S.W.*	174,750	0	0

\* Recommended for acceptance.

## MARKET HARBOROUGH.

For paving and roadmaking works at the new cattle market. Mr. HERBERT G. COALES, engineer, Market Harborough.

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T. PHILBRICK, Leicester (accepted) . . . . . £1,332 5 0

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T. PHILBRICK (accepted) . . . . . 393 0 0

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F. Barnes & Son.	£140	0	0
R. J. Leighfield	119	10	0
A. J. Colborne	108	7	6
J. WILLIAMS, Swindon (accepted)	97	10	0

**ROTHWELL.**

For erection of cemetery chapel, lodge and fencing at Rothwell. Messrs. GOTCH & SAUNDERS, architects, Kettering.

Haycock & Sharman, Rothwell\* . . . £11,401 17 0

\* Accepted subject to modification.

**ST. PANCRAS.**

For erection of a coach-house and stables at the casual wards in Holmes Road.

E. WALL (accepted) . . . £1,374 0 0

**SCOTLAND.**

For paving street leading from Anderson Place to the North British Railway Company's goods depôt, Leith, with whinstone setts.

W. Wilson	£123	12	6
T. Davidson, jun.	114	3	11
Craigpath Whinstone Quarry Co.	108	4	8
W. Dobson	103	17	11
W. Watt	103	16	9
W. Waddell & Son	103	14	0

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For supply and erection of a cast-iron water-tank, 44 feet by 28 feet by 4 feet 9 inches, and two wrought-iron roofs for engine-house and generator-house, 22 feet by 40 feet and 34 feet by 36 feet. Mr. VINCENT HUGHES, engineer.

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Cross & Cross, Walsall, wrought-iron roofs.

**SOUTHGATE.**

For erection of a temporary wood and iron footbridge over the New River at Palmer's Green, also for painting and other works. Mr. CHARLES GN. LAWSON, surveyor.

NORTON BROS. & Co., Ilford (accepted) . . . £96 0 0

**SOUTHBOROUGH.**

For construction of a pumping-station at Upper Haysden, in the parish of Bidborough, about 2½ miles south-west from Tonbridge station. Messrs. G. & F. W. HODSON, engineers, Loughborough.

F. Osenton	£14,683	0	0
Streeter & Todhunter	13,290	0	0
B. Cooke & Co.	12,853	0	0
Enness Bros	12,790	0	0
Martin & Co.	11,495	0	0
A. E. NUNN, Tenterden (accepted)	11,359	0	0

**SOUTHWARK.**

For erection of additional buildings at the rear of the town hall, Walworth Road, S.E. Mr. ARTHUR HARRISON, borough engineer.

T. R. Tomkins	£16,911	0	0
Marsland & Sons	14,967	0	0
J. Smith & Sons	14,465	0	0
Gough & Co.	14,385	0	0
W. H. Lorden & Son	14,333	0	0
J. O. Richardson	14,050	0	0
J. SHILLITOE & SON, College Lane, Bury St.			
Edmunds (accepted)	14,000	0	0
J. Ham	13,334	0	0

**STEPNEY.**

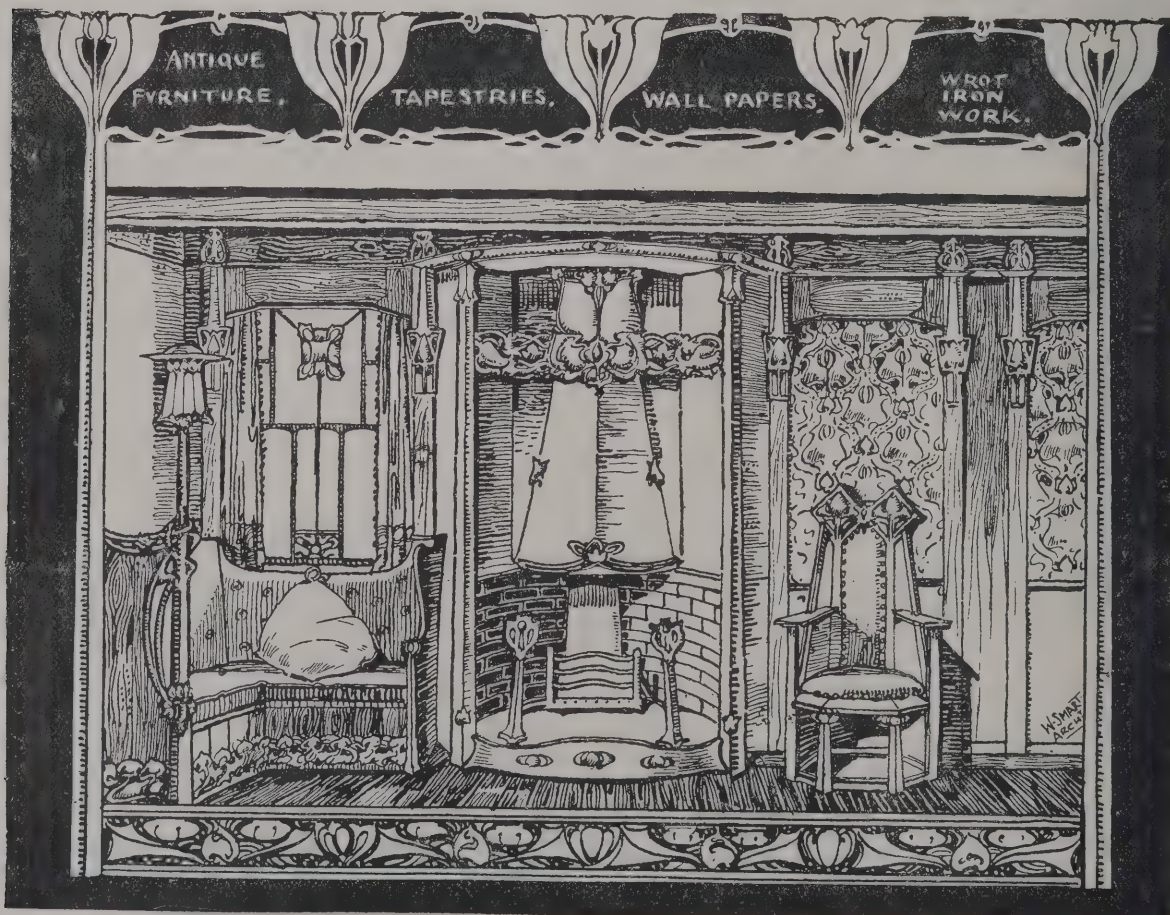
For pulling-down and rebuilding the Bull's Head public-house, Ben Jonson's Road. Mr. J. C. JACKSON, architect, Town Hall Chambers, Borough, S.E.

G. Parker	£1,447	0	0
King & Taylor	1,441	0	0
W. Nash	1,398	0	0
Rice & Son	1,320	0	0
EDWARDS & MEDWAY (accepted)	1,253	0	0

**SWINDON.**

For painting, whitewashing and colouring the interior of the technical schools, Victoria Road. Mr. H. J. HAMP, borough surveyor.

A. E. TUNLEY, Gloucester Street (accepted) . . . £217 10 0



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LANSDOWNE SOLDIERS' HOME, LIMERICK.  
THE SHANNON FACTORY, DALSTON.

TADLEY.

For alterations and additions at Tadley Board school. Mr. J. GIBSON, architect, Basingstoke.  
T. James . . . . . £597 0 0  
McC. E. Fitt . . . . . 595 0 0  
J. Thornwood . . . . . 559 10 0  
J. Harris . . . . . 510 0 0  
Goodall & Son . . . . . 508 0 0  
Goddard & Son . . . . . 496 17 0  
G. HOOKER, Basingstoke (accepted) . . . . . 487 0 0

TOOTING.

For repainting, redecorating and executing general repairs to the Blackshaw Road chapel and lodges at the Lambeth cemetery. Mr. HENRY EDWARDS, C.E., borough engineer.  
R. C. Scutt & Son . . . . . £660 0 0  
T. F. Ball . . . . . 495 10 0  
P. McCarthy . . . . . 417 0 0  
H. Line . . . . . 333 0 0  
G. Keelch . . . . . 333 0 0  
E. Wall . . . . . 295 0 0  
Derrett & Inwood . . . . . 288 10 0  
J. Martin . . . . . 255 0 0  
W. Keys . . . . . 240 13 0  
A. E. Keys . . . . . 239 15 0  
H. BRAGG & SONS, Robsart Street, S.W. (accepted) . . . . . 197 0 0

WALES.

For erection of two semi-detached villas at Pontyclun, Llantrisant. Mr. W. MORGAN, architect.  
C. H. Cooksley . . . . . £1,225 0 0  
J. MORGAN, Pontyclun (accepted) . . . . . 1,092 0 0  
For painting the provision and cattle markets.  
G. Baker . . . . . £260 0 0  
W. T. Watkins . . . . . 215 13 2  
E. Jones . . . . . 215 0 0  
M. Hogan . . . . . 205 0 0  
J. WILLOUGHBY, Pontypool (accepted) . . . . . 140 0 0  
For erection of a chapel for the Hebron Welsh Congregational church, Cymmer, Port Talbot.  
D. LLOYD, Cymmer (accepted) . . . . . £1,636 0 0  
For erection of ten houses at Port Talbot. Mr. FRANK B. SMITH, architect, Port Talbot.  
A. MacVist . . . . . £1,810 0 0  
T. Mawlls . . . . . 1,720 0 0  
J. NICHOLAS, Port Talbot (accepted) . . . . . 1,690 0 0  
For sewerage works at Brewers Quarry, Llanelly, Breconshire. Mr. D. WILLIAMS SLOCOMBE, surveyor.  
J. MONKS & CO., Newport and Crumlin, Mon. (accepted) . . . . . £251 6 0

WHITBY.

For erection of a pair of semi-detached houses, Prospect Hill, Whitby. Mr. EDWARD H. SMALES, architect, Whitby.  
Coverdale & Longhorn, Spring Hill, brickwork, mason, slating, plastering, carpenter and joiner . . . . . £1,092 10 0  
E. Smithson, Station Square, plumbing, glazing and smith . . . . . 130 18 0  
Burdon, Flowergate, painting . . . . . 26 10 0  
For erection of farm buildings at the Plum Tree Farm, Glaisdale, Egton estate. Mr. EDWARD H. SMALES, architect, Whitby.  
R. A. Wilson . . . . . £781 17 6  
R. Harland . . . . . 693 0 0  
A. Palframan . . . . . 611 18 0

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## WIGAN.

For alterations and additions to the Wesleyan church, Standishgate, Wigan. Messrs. J. B. & W. THORNLEY, architects, Library Street, Wigan.

Hirst & Son	£3,290	0	0
Wilson & Co	3,140	0	0
Wood & Son	3,312	0	0
Rathbone	3,874	0	0
Winnard & Son	3,419	0	0
D. A. Ablett	3,279	0	0
J. JOHNSON & SON, Wigan (accepted)	3,098	0	0

## WORKINGTON.

For whitewashing, colouring and painting the inside of the St Michael's, Lawrence Street, Victoria, and Westfield Board schools.

## Accepted tenders.

Harwood & Cowan	£36	10	0
W. T. Sherwood	33	0	0
H. Sanderson	25	0	0
G. Davies	22	0	0

Received too late for Classification.

## CAMBERWELL.

For kerbing and asphalt paving in Goodyear Place, Addington Square.

T. Adams	£424	4	6
T. Faldo	386	12	3
Lawrence & Thacker	372	19	0
J. Smart	371	4	9
W. Pearce	353	16	7
A. C. Soan	353	16	6
Brunswick Rock Asphalt Paving Co.	352	6	8
W. Griffiths & Co., Ltd.	351	8	3
Trinidad Lake Asphalt Paving Co., Ltd.	335	3	4
J. Mowlem & Co.	329	7	2
A. C. W. Hobman & Co.	317	11	6
J. E. Etheridge	295	9	6
Fry Bros.	286	16	6
G. J. ANDERSON, Poplar (accepted)	282	19	10
Seyssel and Metallic Lava Asphalt Co.	239	5	0

## NEW CATALOGUE.

AN admirably concise and businesslike catalogue has just reached us from the Empire Boiler and Engineering Co., Ltd., of Empire Works, Halifax. It contains some 150 pages of carefully compiled and fully illustrated letterpress, descriptive of the multifarious designs in boilers, for the manufacture of which this firm has established a reputation. Among the illustrations examples are to be found of boilers for every imaginable purpose, with their dimensions, heating power, cost and all other necessary information, and if by chance any special pattern may not be found in the pages, it will be quoted for immediately on receipt of inquiry, drawing, or model. In addition to purely catalogue information, the book also contains several pages of tables which will be found eminently useful to heating engineers, &c.

This company has recently erected extensive works adjoining the Great Northern and Lancashire and Yorkshire Railways, and which are at present carried on in conjunction with their city works, where the brass steam and water fittings are manufactured. The new works have been specially designed for the manufacture of welded and rivetted wrought-iron, steel and copper boilers, and have been equipped with modern machinery specially built for this business, the whole giving the utmost facilities for carrying out the various processes of manufacture expeditiously and economically, and at the same time insuring high-class work.

The whole of the machinery is electrically driven, no other motive power being employed, the works being equipped with a complete electrical installation—engines, dynamos, accumulators, &c. Each machine is fitted with its own motor, and is therefore independently driven, the necessary current being taken from the accumulators, whose capacity is sufficient to drive the machinery for forty-eight hours in the event of a breakdown, thus preventing any stoppage of the work. As soon as the additions to the new works are completed the offices and brassworks will be removed to them, thus bringing the whole of the various departments under one control, still further facilitating expeditious production, and making the Empire Works as complete as is possible for carrying out the work for which they are designed.

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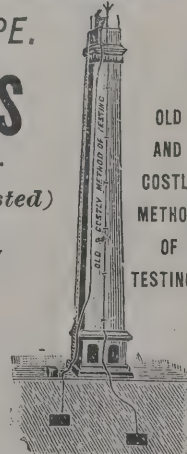
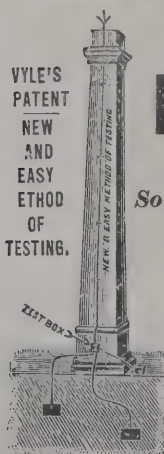
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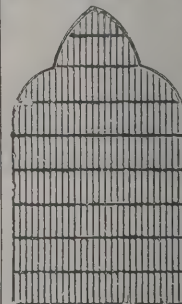
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ELECTRIC NOTES.

At Rugby Mr. A. A. G. Malet, Local Government Board Inspector, held an inquiry with reference to the application of the Rugby Urban District Council for sanction to borrow £9,000 for electric lighting purposes. Mr. T. M. Wratlaw, clerk to the Council, laid the proposed scheme before the Inspector.

THE London County Council has acquired a site for an electric tram station in connection with its new electric tram line from Westminster Bridge to Tooting, now in course of construction, conveniently near the Elephant and Castle. The site abuts on Dantzic Street, Parliament Street and Market Row. Operations for the building of the station will be begun on an early date, and it is expected that with the present rate of progress the electric cars will be running early next year.

THE supply of electricity to Birkdale by the Birkdale District Electric Supply Company, Limited, was inaugurated on the 1st inst. The cost of the station will be £30,000. It is situated at Shaftesbury Road, has three separate dynamos capable of giving an output of 220 amperes at 500 volts, and they will respectively develop a maximum of 220 kilowatts. At the conclusion of the ceremony lunch was served in the Palace Hotel. Mr. Weld Blundell, in responding to the toast of the Urban District Council, made an amusing onslaught on the modern developments of electricity and steam, such as the telephone and the motor car.

PROFESSOR CAPPER has sent in a report on the proposed electric installation for Dumfries. He was to advise the Council as to the best method of supplying the burgh with electricity (a) for lighting, (b) for lighting and tramways combined, and in particular whether it would be better to use gas or steam as a motive power. In making his calculations he takes the receipts from public lighting at 620%, and in the case of the tramways, he proceeds on the footing that the gross receipts would be 1,750%, his understanding being that the present receipts from waggonette traffic to Glencaple, which he puts at 200%, would be trebled. He recommends that the burgh should at once make the necessary agreements with the neighbouring local authorities to construct an electric tramway from Dumfries railway station to Glencaple, and that the burgh should also proceed at once to erect a generating station, so that it should be ready to supply current to lamps and tramways as soon as possible. The cost, with steam plant, would, he estimates, be 34,000% for lighting, or with con-

densing plant 1,000% extra. For lighting, plus tramways, 38,000%. With gas plant, the cost for lighting, plus tramways from St. Michael's Church to Glencaple, would be 39,150%, with a further cost of 19,000% for tramways from St. Michael's to the railway station.

VARIETIES.

MR. JAMES GLEN, who for upwards of 31 years has held the office of town clerk of Gourock, N.B., has tendered his resignation of the position, and his resignation has been accepted.

THE latest of Mr. Percy Lindley's holiday booklets, issued under the auspices of the Great Eastern Railway Company, is entitled "Holidays in Belgium, with Brussels and the Ardennes," and, like all the books in this series, so interestingly written and charmingly illustrated as to make one long to pack up and start at once on the delightful tour described.

ON Monday afternoon the new Brixton Prison was opened for the reception of prisoners, male and female, from courts south of the Thames on remand, and trial prisoners from the South London Sessions and Surrey Quarter Sessions at Kingston. The new goal will greatly relieve the overcrowding which has existed at Wandsworth and Pentonville Houses of Detention for some considerable time past.

THE Archbishop of York visited Scarborough on the 2nd inst. to consecrate the new church of St. Saviour's, which has been built in the north-west ward at a cost of nearly 4,000%. Accommodation is provided for 400 worshippers, and the portion consecrated is a part of a new church designed by Mr. J. T. Micklethwaite, of Westminster, in the Early Decorated style of architecture in three spans, with a bell turret in the centre.

THE twenty applications which have been received for the vacant position of town clerk of York were considered by the finance committee of the Corporation, who selected the following to appear before them at a meeting on Monday next, August 11, when a final choice will be made:—Mr. W. J. Board, deputy town clerk, Cardiff; Alderman R. Percy Dale, solicitor, York; Mr. J. H. Field, deputy town clerk, Bolton; Mr. T. C. Hughes, town clerk of Lancaster; Councillor W. A. Pearson, solicitor, York; and Mr. P. Thomas, town clerk of Leigh. The salary offered is 700% per annum.

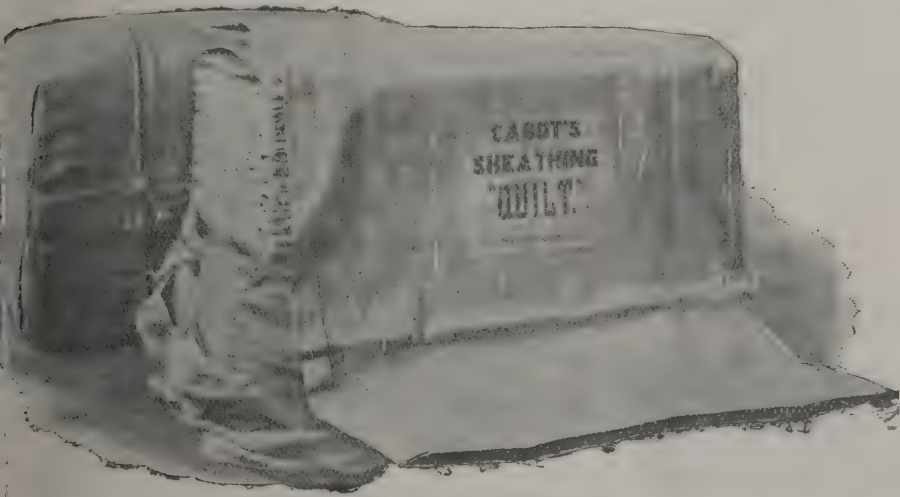
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A HANDSOME new screen has been presented to Charlton Kings Church, Gloucestershire, by Sir Frederick and Lady Dixon-Hartland. It is of the sixteenth-century style, and consists of nine bays, with six niches at base and side of a central doorway; the niches (which are richly canopied) containing angels, symbolising praise and prayer. In the upper cornice appears the inscription:—"To the glory of God and in thanksgiving for His mercies this screen was given to the church by Sir Frederick Dixon-Hartland, Bart., M.P., and Agnes Chichester, Lady Hartland, his wife, A.D. 1902."

AFTER being closed for some time while undergoing extensive structural alterations and improvements, the parish church of Fyvie, Aberdeenshire, was reopened on the 24th ult. The extensions and embellishments have been effected at a cost of several thousand pounds, borne by Mr. A. J. Forbes-Leith, of Fyvie, and the walls of the eastern end of the new apse are filled with a fine three-light stained-glass memorial window, manufactured by the Tiffany Co., New York, and erected in expression of the love and affection of American friends to the memory of his son, the late Lieutenant Percy Forbes-Leith, who died in Newcastle, Natal, on the last day of 1900, and whose remains are interred in a new vault situated at the western entrance to the church.

THE health committee of the Corporation of Eccles have resolved to invite competitive plans for the laying-out of the insanitary area of Eccles, which comprises over 20,000 square yards in the town, and which is bounded by the main thoroughfare leading from Manchester to Liverpool and from Eccles to Barton. Provision is to be made on the site for the accommodation of, at least, 170 persons who may be displaced by the carrying-out of the Housing of the Working Classes Act. Over 40 houses on the site have been closed for more than twelve months by order of the borough magistrates. The rentals of the houses which are to be erected are not to be less than 6s. per week, nor more than 8s. Sufficient land is to be retained in front of the area for the erection of business premises. Premiums are offered to architects of 50%, 30% and 15% for the plans respectively placed first, second and third in order of merit.

ST. CATHERINE'S new National schools, Dublin, were opened on the 1st inst. by the Countess of Meath. They are situated in Donore Avenue, South Circular Road, and are constructed to accommodate 500 pupils. The site is a central and convenient one. The cost of the new buildings has been

3,300%, and towards this amount the Commissioners of National Education have made a grant of 1,846%. The Dublin Corporation have undertaken to cover the Poddle river at a cost of 1,800%, thus improving the neighbourhood and giving a much better entrance to the schools. The new schools are spacious, lofty, well lighted and will be a valuable addition to the parish. The old schools, situated in Thomas Court, were very unfavourably situated, and in addition to this serious defect they were badly constructed, and the children who attended them naturally suffered a good deal of inconvenience. The new buildings contain separate schools for boys and girls, and infants' Kindergarten. They will be under the National Board and, in addition to the ordinary programme, it is announced that a room is being fitted up for the purpose of cookery and laundry lessons. The buildings were designed by Mr. Fuller, architect.

BURTON WOOD, Lincs, is a parish with only one ecclesiastical building, viz. a condemned church. The church-building scheme is being taken up very warmly. A preliminary meeting was held on Saturday at the vicarage house, the Bishop of Liverpool presiding. Apologies for absence were received from Lord Lilford and the Archdeacon of Warrington. The Bishop, in the course of his remarks, said a new church was both necessary and desirable on the ground of structure, of size and of situation. The present building had been condemned some time ago by the Ecclesiastical Commissioners; in his opinion it was the worst church in the diocese. Its size was insufficient for present needs, and the space it afforded altogether inadequate to the population of the parish. The present site was also unsuitable, being too far removed from the steadily increasing population of Collins Green. A resolution to this effect was unanimously adopted. It was resolved to take immediate steps to secure a suitable, and if possible free site for both church and hall, conveniently placed between the two chief centres of population—Burton Wood and Collins Green. A sum of 8,000% at least will be required.

THE foundation-stones of a new Free Methodist church have been laid at Murton, near Backworth. The new building will take the place of the old historic structure that has played such an important part in the history of Methodism in Northumberland.

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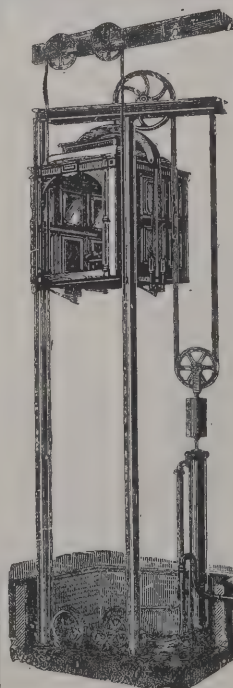
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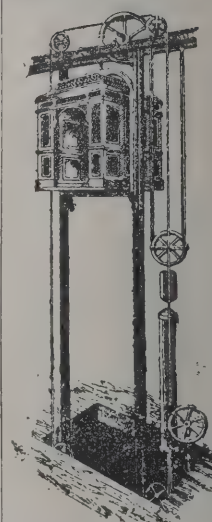
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## TRADE NOTE.

The Cherry Tree Machine Company, Ltd., engineers and founders (proprietors of the Manchester Laundry Engineering Company), Cherry Tree, near Blackburn, have secured the contract for the supply of laundry machinery to the infectious diseases hospital, Penarth.

## BUILDING AND BUILDERS.

**MEMORIAL-STONES** of a new Primitive Methodist church have been laid at South Shields. The new building will seat 1,000 people, and is expected to cost 3,500*l*.

**THE foundation-stone** of a new workhouse hospital at Whitehaven was laid on the 31st ult. The site of the proposed building is to the north of the workhouse, and the hospital will afford separate departments and accommodation for both sexes.

**THE plans** for the reconstruction of the terracing at Ibrox Park, the scene of the lamentable accident on April 5, which have been prepared by Mr. Leitch, architect, Glasgow, who designed the park originally, show that the Rangers purpose reducing the terracing on the west end of the field, where the accident occurred, to the same height as that of the east end, and also to very considerably strengthen the whole of the terracing.

**THE corner-stone** of a new hospital at Springhead, Meltham, for the treatment of infectious diseases, excepting small-pox, was laid on the 2nd inst. The hospital buildings will cost 744*l*, and consist of seven blocks, affording accommodation for 150 patients. The hospital site occupies nineteen acres, seven acres being covered by the buildings, and is 790 feet above sea-level. The townships included by the hospital committee are Golcar, Holme, Holmfirth, Honley, Linthwaite, Marsden, Meltham, Netherthong, New Mill, Scammonden, South Crosland and Thurstonland, having a total population of 54,111, and an aggregate rateable value of 182,852*l*.

**THE directors** of the Caledonian Railway have under consideration a plan for the construction of a large new passenger station at Port Glasgow. The accommodation at the existing station has given rise to many complaints, and Port Glasgow

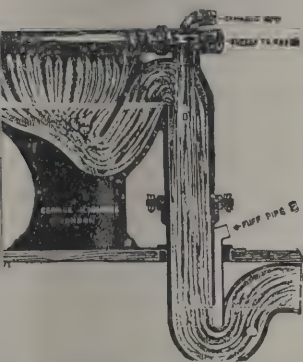
Town Council on several occasions have made representations to the company, urging them to provide increased facilities. Extension of the double line of rails from the west of Port Glasgow to Wemyss Bay is also given as a reason for the proposed scheme. Should the plan be fully carried out, a sweeping change will be made in the centre of Port Glasgow, as the proposal is stated to embrace the demolition of the Star hotel and properties at the head of Princes Street. The bridge to Barr's Brae would also have to come down, and would be replaced by two iron bridges, one leading to the station.

A SPECIAL meeting of the Cavan County Council was held on the 2nd inst. for the purpose of taking into consideration the question of establishing a lunatic asylum in the county. At present all the lunatics from Cavan are sent to Monaghan asylum, which is overcrowded, and a loan of 50,000*l*. is required to make the necessary increased accommodation. The total number of inmates in Monaghan amount to 821, and out of that number 437 are from Cavan county, for which the county has to pay 12,600*l*. a year, or two-thirds of the cost of maintenance of the establishment. It was suggested that a deputation from the Council should wait on the Inspectors of Lunacy and lay the matter before them, and also to interview the Lord Lieutenant, with a view of getting their sanction to the building of an asylum. The suggestion was unanimously agreed to.

A RECENT Canadian invention consists of bricklaying by machinery instead of by hand. The machine, according to a consular report, worked by two men and a lad, will lay 400 to 600 bricks per hour. Door and window spaces cause only a slight delay. The machine is suited for all plain work, such as walls, sheds, mills, factories, rows of cottages, piers of bridges, &c. Considerable pressure is put on the bricks, and it is claimed that the work is more firmly done than by hand. The invention will do the work of six or seven skilled bricklayers, and it is believed that a machine adapted to build a factory covering about 60 feet by 40 feet could be put on the market for 100*l*. The apparatus can be readily worked after a fortnight's instruction.

MR. A. A. G. MALET, M.Inst.C.E., an inspector under the Local Government Board, held an inquiry recently at the County Hall, Oxford, with reference to the application by the Oxfordshire County Council for sanction to borrow 60,000*l*. for the enlargement of the county asylum at Littlemore. In reply to the inspector, Mr. Davenport (clerk to the County Council)

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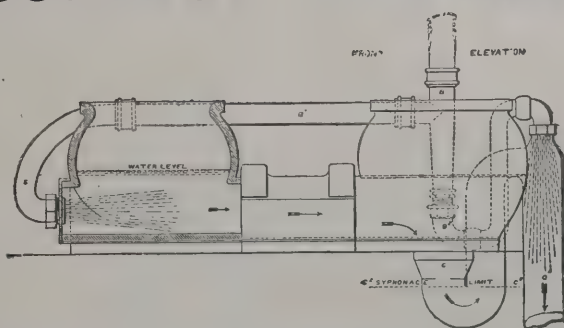
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This Closet has been adopted in Windsor Castle, Buckingham Palace, the residence of the Marquis of Salisbury, the Surveyors' Institute and Institution of Civil Engineers, Westminster, the Hôtel Cecil, Broadmoor and Hanwell Asylums, the various Railway Stations, and public and private Buildings of all kinds.

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stated that he did not know of any opposition to the application. The asylum was built in 1846, and the county took into union with it the city of Oxford, the county of Berkshire, including Reading, Windsor and Abingdon. All of these local authorities had withdrawn from the union except the city of Oxford, and the county and city remained the sole partners in maintaining the asylum, two-thirds of the expenses being provided by the county and one-third by the city. For some years the visitors had been urged by the Lunacy Commissioners to enlarge the asylum. The accommodation recognised by the Commissioners was 490, and the usual number of patients now was about 555 to 560. Statistics showed a gradual increase in the past, which threatened to be maintained in the future. The local authorities decided upon the enlargement of the buildings on the present site at a cost of 58,000*l.*, exclusive of the land, the value of which was just under 7,000*l.*, and had already been paid for. Permission was asked for the loan to extend over thirty years. The inspector went through the plans and intimated that he would report to the Local Government Board.

MR. S. MONCKTON COPEMAN, M.D., Local Government Board inspector, held an inquiry at Oundle, Northamptonshire, last week into the application of the Rural District Council for sanction to borrow the sum of 2,000*l.* for the erection of an infectious diseases hospital which they propose to build in Wood Lane. It was suggested to erect an iron building as a temporary structure, but to have permanent drainage and water scheme, and the figures shown for the proposed hospital were:—Price of land (3 acres), 300*l.*, while the drainage, pathways, &c., would cost 400*l.*; caretaker's lodge, 800*l.*; water supply, 150*l.*; architect's fees, 200*l.*; contingencies, 250*l.*; total, 2,000*l.* The population of the rural district was 8,093, number of parishes, 34, and Oundle was situated nearly central. The assessable value was 45,399*l.* There were no loans. The area was 58,807 acres, exclusive of Oundle. In April last a letter was received from the Urban Council objecting on the grounds that the proposed site had a quarter-mile zone with a large number of houses, and the half-mile zone had about 600 inhabitants. Mr. Coombs, clerk to the Rural District Council, explained that it was impossible to avoid highways or doing injury to someone, and he did not know of any site to compare with this. It was remarkable that the Urban Council had taken all this time to consider it was not a suitable site, when in the early stages it was the one selected by them. Mr. Gotch explained the plans, which provided for nurses'

sitting-room, six bedrooms and bathroom, porter's room, kitchen and the usual offices. The Inspector: You have provision for storeroom or doctor's room. Mr. Gotch: The linen could be kept in the hospital itself, and temporary provision be made for dispensary. The Rev. Canon Moore explained what had taken place between the two Councils, and said they had hoped the County Council would have put out a scheme. Mr. Sanderson asked if it was usual to have a small-pox and a general hospital on the same site. The Inspector: Yes, in small places, with an undertaking that small-pox could be not treated concurrently. Mr. Sanderson: I know the Urban Council have always been against an isolation hospital. The proceedings then closed, and the inspector proceeded to view the site.

At Durham on the 24th ult. the foundation-stone was laid of a new Wesleyan church which is being erected in a prominent position in Old Elvet, on a site which was purchased at a cost of a little over 2,000*l.*, the cost of the building, which is from the designs of Mr. W. J. Morley, Swan Arcade, Bradford, and will include a school, being about 8,000*l.* or 10,000*l.* in all. The building will be of Perpendicular Gothic architecture, having at the north-east corner a tower and spire 110 feet in height. The tower will have Gothic inlets on each side and finials on the top. The whole structure will be faced with plain face wall stones, with ashlar stone dressings and mouldings to the windows, and mullions with sunken tracery. The front elevation to Old Elvet will be set out by buttresses and octagon shafts and octagon pinnacles. There will be a fine full light window let into the front face 30 feet in depth and 20 feet in width, which will be sufficient to light the whole of the church, there were no side tracery windows. There are, however, four of the latter on each side of the nave, 11 feet in height, with 5-foot openings, so that there will be ample provision for admission of daylight. As the visitor enters, the vestibule will first be reached. From this on either hand a staircase leads away to the gallery running round the church. The length of the church from the front entrance to the back of the chancel will be 78 feet, the width at the entrance will be 58 feet, in the nave 50 feet, and there will be two large transepts of 14 feet. Adjoining the church will be the choir-rooms, minister's vestry, organ-chamber and choir-vestry. Behind there will be an infants' room, a ladies' room and large schoolroom 56 feet long and 30 feet wide, and, at the rear of all, three classrooms 17 feet long and 14 feet wide. The schoolroom will be a fine apartment. Its height will be 33 feet, and the classrooms will be

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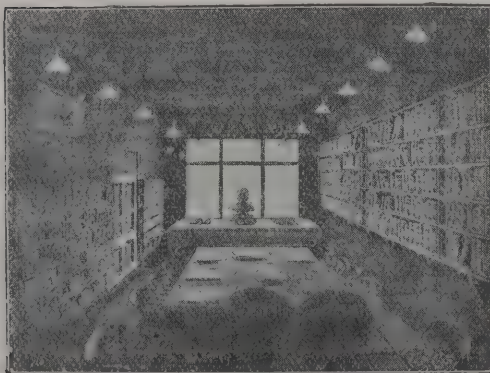


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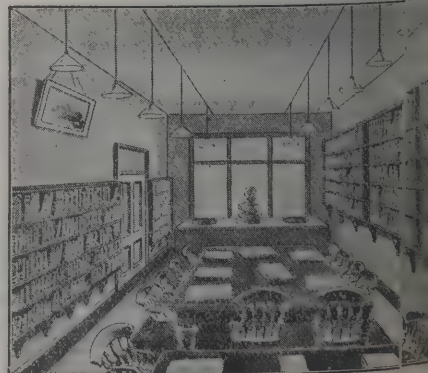
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### NOTTS NEW COUNTY LUNATIC ASYLUM.

The finishing touch was on the 29th ult. put to the new lunatic asylum for the county of Notts, which has been erected at Cliffe-on-Trent from the designs of Messrs. E. P. Hooley & Sander.

Of the site, which comprises an area of 134 acres and 6,880 $\frac{1}{2}$ ., about 22 acres is absorbed in the buildings, lawns and recreation grounds for the patients. The kitchen and laundry will cover about 10 acres. The remainder of the farm is laid down with grass, it being the intention of the committee to produce on the farm the milk for the whole of the patients. The main entrance is on the Cropwell Road, which skirts the eastern side, near which are situated two pairs of large villas for the chief engineer, head attendant and other officials. The main entrance block is situated on the north side, and contains the chief offices and visiting rooms, through which access is obtained to the main corridors communicating with both wings of the asylum. The patients' blocks for males are situated on the east side, as also are the nurses' house, electrical generating station, workshops, bakery and mortuary. The females are placed on the west side, where is situated the laundry block and sewing-room. The central portion of the asylum consists of the general administrative buildings, comprising the general stores and kitchen department. Adjoining these buildings is a spacious recreation-ground designed to accommodate 600 patients, and this is provided with dressing-room accommodation as well as a stage completely fitted with every arrangement for theatrical and musical entertainments. The accommodation for male and female attendants is on either side of the administrative block, the dispensary, as well as the necessary quarters for the housekeeper and servants, being on the south side of the recreation-hall, near which a corridor leads to the assistant medical officer's house. The residence for the medical superintendent is west of the main

buildings, and 300 yards still further to the west is placed the isolation hospital. The administrative buildings are designed to accommodate 600 patients, but patients' blocks have been erected at present for only 452 (226 of each sex). The general construction of the building is of brick, and it has been planned on simple but substantial lines. The interiors of the patients' blocks are finished with a view to the comfort and health of the patients, rather than ornamentation. Wood dadoes are provided in all day rooms. The woodwork throughout is of varnished deal, glazed bricks and tiles being provided wherever necessary. The chapel is of brick construction with stone dressings and tiled roof, and is designed in the Early Gothic style. The interior is finished in a simple manner with plastered walls and pitch pine roof, the flooring being laid with maple blocks. Pitch pine benches are provided to accommodate about 400. The pulpit, reading desk and other special fittings are in polished oak. The engineers and architects responsible for the work are Messrs. E. P. Hooley & J. Sander. Mr. J. J. Bird has acted as clerk of works. The following is the list of contractors:—For the foundations, Messrs. T. Fish & Sons, Nottingham; general contractors for superstructure, Messrs. Pattinson & Sons, Ruskington, Sleaford; heating and ventilating, cooking plant and general engineering, Messrs. Ashwell & Nesbit, Ltd, Leicester; electric lighting plant, Mr. T. Scott Anderson, Sheffield; laundry machinery, Messrs. D. & J. Tullis, Ltd., Kilbowie; locks, &c., Messrs. Wing & Webb, Wolverhampton; sanitary goods and fittings, Messrs. Doulton & Co., Ltd, London; furniture, Henry Barker, Ltd, Nottingham; decorations, &c., Mr. W. J. Sissons, Nottingham.

The total cost of the whole of the buildings and engineering work, site, furnishing, fees and every other item of expenditure in connection with the erection and completion amounts to about 140,000 $\frac{1}{2}$ ., but when the asylum is fully completed for 600 beds it is anticipated the total expenditure will amount to 154,800 $\frac{1}{2}$ ., or be at the rate of 258 $\frac{1}{2}$  per bed.

### THE HOUSING OF THE WORKING CLASSES.

The report of the joint select committee of the House of Lords and the House of Commons on Housing of the Working Classes has just been issued as a Parliamentary paper (171). The committee were appointed to consider the standing orders relating to houses occupied by persons of the labouring class,

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and the clauses usually inserted in private and local bills and provisional order confirmation bills in pursuance thereof, and to report whether any amendments should be made in such standing orders and clauses. The following is the text of their report:—

1. We submit two model clauses and three corresponding standing orders, which we recommend in place of the present model clauses and Standing Orders 38 and 111 (H.L.), 38 and 183a (H.C.), dealing with London and all places outside London respectively.

2. We suggest that the model clauses be embodied in a public general Act of Parliament.

3. After hearing evidence and consulting the officials of the Home Office and Local Government Board, we have come to the conclusion that in London it is desirable that every case in which houses of the labouring class are proposed to be taken should be notified to the central authority, while outside London it is sufficient that the attention of the central authority should be called to cases in which thirty persons belonging to the labouring class are displaced in one borough, urban district, or rural parish, as the case may be.

4. In settling schemes for providing new houses in place of those demolished, we think it advisable that the central authority should exercise a full discretion.

5. We recommend that the new houses to be provided be suitable for persons of the labouring class and not too ambitious in character and design; we attach much importance to these conditions.

6. It will be observed that the area within which the new houses may be provided under a scheme is left by us wholly to the discretion of the central authority. It may be, and, we think, will be, found expedient in some cases to erect the new houses at some considerable distance from the houses demolished, and not necessarily within the jurisdiction of the same local authority.

7. We recommend that in London the central authority be empowered to fix all rents for the new houses.

On this point we are not agreed. The above decision was arrived at on a division by six votes to three.

8. In regard to Ireland and Scotland, we were informed that neither the Lord Lieutenant of Ireland nor the Secretary for Scotland desired to make any suggestions to us.

So far as we can judge, our recommendations for places outside London are, with the necessary alterations, suitable for Ireland and Scotland.

The two model clauses and three standing orders referred to by the committee in Section I. have not been printed in the report.

### A PORT OF BIRMINGHAM.

THE Birmingham Chamber of Commerce will shortly receive a communication from the North Staffordshire Chamber as for co-operation to form a waterway from Birmingham to South Staffordshire through the Potteries to Liverpool. The argument in favour of such an expensive scheme is that railway rates are excessively heavy, and if such a canal in existence it would be a great boon to traders. The rate for hardware, for instance, from Birmingham to Liverpool is 20s. 2d. per ton, and for bedsteads 18s. 11d. The railway have killed the exportation of iron from South Staffordshire. Formerly thousands of tons used to be sent abroad, but now it is the other way about; merchants order their heavy iron such as girders, from Belgium. The reason is that the railways encourage the foreigner. The rates from Hull to Birmingham are much cheaper than for the journey the other way, from Birmingham to Hull. This is the sort of thing which makes the Midland trader restive, and again and again has turned his attention to a ship canal scheme. It remains to be seen whether the present effort will be more successful than the one advocated a few months ago, when it was suggested to reach the sea by way of the river Severn and the English Channel.

### A STRAND BRIDGE.

THE question of constructing a bridge across the Strand from the bottom of Wellington Street has been referred on the motion of Sir John Wolfe Barry, K.C.B., who is an alderman of Westminster City Council, to the works committee.

Seen on the subject by a *Daily News* representative, John explained his scheme in detail. By way of removing congestion he would carry the north and south traffic by gradients across the Strand by means of a bridge over the present roadway. The gradient would begin on the south side near Waterloo Bridge, and on the north a short distance from Wellington Street. In no case would the incline be at a sharper angle than is Ludgate Hill or St. James's Street. The approaches and bridge would form an entirely new road over sites now covered by existing buildings, enabling the

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to move freely without interfering with the traffic in the d. The existing roadway in Wellington Street would re-very much as it is now, enabling vehicles or pedestrians to or coming from the Strand to journey with greater by reason of the lessened traffic.

uch a scheme coming from so eminent a civil engineer is in to command a good deal of attention. It remains to be whether the Westminster Council will approach the on County Council to find out whether the scheme can be died in the Strand improvement.

he utility of the new street from Holborn to the Strand, John thinks, will be greatly marred if no means are pro- for dealing with the increased traffic that will be brought is point. The congestion is bad enough already, but once new avenue, which empties itself into the Strand at ington Street, is complete, the obstruction promises to ne serious.

his is an old idea of Sir J. Wolfe Barry's for relieving the c of London at congested points. He laid an elaborate ne before the Society of Arts two or three years ago which sed much interest at the time. He would construct cross- bridges or underground subways at Ludgate Circus, adilly Circus, Hyde Park Corner and at Oxford Street by enham Court Road. With the exceptions of Holborn uct, of the north approach of London Bridge crossing nes Street, of the famous Highgate Archway, which carries usey Road over the Archway Road, and of the arches ing the south approaches of Waterloo, Blackfriars and hwark bridges over the roads immediately adjoining the ank, there are no means of crossing the streets of on otherwise than on the level.

Of course all such works would be costly, Sir John readily its. They would involve not merely the actual crossing of ing thoroughfares by means of bridges and viaducts having ned approaches, but the connection of the streets on the must, of course, be also maintained, so that traffic could ge its direction easily. Sir John claims, however, that the its would be well worth the expenditure. In view of what een spent voluntarily by railway companies in getting rid vel crossings and junctions on their main lines of traffic, he not think the outlay necessary for providing over or under sings for the enormous vehicular and pedestrian traffic of on ought to stand in the way of such improvements. n crossings, he claims, would be as efficacious in their way systematically meeting the wants of London as the other

more obvious work of widened thoroughfares, while they possess the advantage that they could be put in hand at once without waiting for the completion of new thoroughfares.

"There is no reason whatever," said Sir John, "why such works should be unsightly. On the contrary, they might be made highly artistic, and become architectural embellishments of London. The mode of carrying them out would require careful study, as different crossings would have to be dealt with in different ways. I have given some consideration to the subject, and I can say there is nothing impracticable in this suggestion of mine for dealing with the growing problem of London traffic. It is a mistake to think the tube railways will solve it. At one time it was thought the Underground would solve it. Everybody knows that the congestion of traffic in the streets of London becomes worse every year, and I venture to think my schemes will help to relieve the congestion on practical lines."

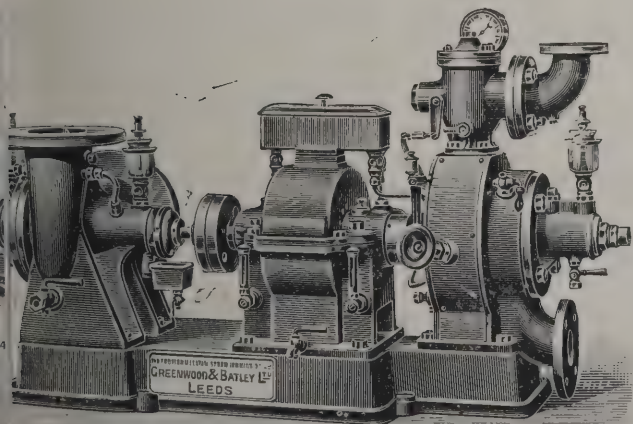
#### BRASS ASHES AS ROAD MATERIAL.

In the sixth report of the committee of public accounts the Comptroller and Auditor-General, in his report on the accounts of the ordnance factories, makes the following observations:—"In the examination of the remains of the royal laboratory stores it was noticed that the ashes of the brass foundry and rolling mills were valued at 5*l.* 17*s.* 6*d.* and 6*l.* 2*s.* 6*d.* a ton respectively on March 31, 1901, although the price obtained for them on sale during the year was 3*s.* 4*d.* a ton only. In reply to an inquiry as to this apparent discrepancy in rates, information has been furnished which shows that the basis adopted for valuation is correct, inasmuch as a new contract was entered into at the close of the year at the higher rates. As the circumstances connected with the credits from the sale of these ashes are exceptional, it may be desirable to mention them. It was decided in May 1889, when the Building Works Department became a part of the ordnance factories, to issue the ashes from the royal laboratory brass foundry and rolling mills free of charge to the superintendent of the Building Works Department for making roads, making up ground, &c., in the Arsenal generally, and this practice continued until June 1900, when an offer was made by a firm of contractors to take and remove all the ashes from the brass furnace fireholes at the rate of 3*s.* 4*d.* a ton. This offer was accepted for a period of six months. Towards the end of the year 1900 it was reported to the Chief Superintendent of the Ordnance Factories by the

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police that some scraps and splashes of metals were being picked up and sold to marine-store dealers in the neighbourhood by some building contractors' men in the marshes. A sample of the ashes which were being removed was made up, and when put up to sale realised 6*l.* a ton. Tender forms were then issued to various contractors for a contract for the half-year to September 1901, and finally the tender of the firm who had been paying 3*s.* 4*d.* was accepted at 5*l.* 17*s.* 6*d.* and 6*l.* 2*s.* 6*d.* a ton for ashes estimated to weigh 780 tons from brass metal foundries and rolling mills Nos. 1 and 2 respectively, involving a prospective receipt for the half-year of 4,700*l.* In September 1901 even higher tenders were obtained for these ashes, a contract being made at that date at 6*l.* 7*s.* 6*d.* and 7*l.* 7*s.* 6*d.* a ton for brass foundry rolling mill No. 1 and rolling mill No. 2 respectively. Foundry ashes are also obtained from manufacturing operations in the royal carriage department and the royal gun factory at Woolwich, but in smaller quantities. The former were disposed of at the auction sale of the principal ordnance officer in 1900 and realised about 3*l.* a ton, while the latter were treated in the gun-factory foundry, and any metal found in the sifting was used up at the time."

The committee have made investigation into the condition of things thus brought to light, and have examined Colonel E. Bainbridge, C.B., the chief superintendent of the ordnance factories, on the subject. His statement is that for many years the ashes from the brass foundries of the several factories have been used for the purpose of making and repairing the roads of the Royal Arsenal, the superintendent of building works paying out of public funds the sum of 1*s.* a ton for the ashes and dross from the gun factory, but receiving them free of charge from the other factories which produce them. Only a small quantity comes from the gun factory, the bulk being yielded by the royal laboratory and the gun-carriage factory. The question of the disposal of these ashes was discussed by the military authorities in 1877, when, as the result of the discussion, each department at Woolwich began to claim 1*s.* a ton for the ashes. In 1889 the question was again raised, and it was then decided to issue the ashes free of charge for the purpose of making roads, the Superintendent of the Royal Carriage Department reporting that "he could not say whether the stuff could be disposed of . . . for any money value. He knew of no one likely to want it, and it would only be of use for filling up hollows." The ashes were accordingly so disposed of until the year 1900. In that year

largely increased quantities of these waste products had to be dealt with; therefore, in order to avoid inconvenience at the Arsenal, a contract was entered into with Messrs. McKee & Brothers under which that firm were to take all the ashes and to pay 3*s.* 4*d.* a ton for them. This offer, "which . . . turned material hitherto treated as waste into a marketable commodity was readily accepted, and a six months' contract was made. The contractors took the ashes to their own foundry.

Colonel Bainbridge's statement is as follows:—"Towards the end of October 1900 the police found that some scraps and splashes of metal were being purchased by marine-store dealers in the neighbourhood from some building contractors engaged at work in the marshes—that is to say, the old roads which had been made outside our Arsenal, by the proof being going out to the magazines. It was ascertained that this material had been picked up from slag and ashes deposited long ago in the marshes, and recently turned over and so exposed to weathering influences. The attention of the police was specially directed to the ashes, and Police-Sergeant Greenham discovering similar scraps and splashes in the ashes which were being loaded up under his immediate observation promptly reported the fact and expressed the opinion that what was going out was worth more than we were receiving for it. I then personally investigated the ash-heaps, and found them even after being picked over, still rich in metal. I immediately had a representative sample of this, weighing two tons, put up for sale, when it realised 6*l.* per ton. I then carried out experiments to ascertain whether it would pay to pick out all the metal or to melt it out. The first was found impracticable, owing to some of the splashes being very minute. I then tried picking out the large pieces and melting up the rest. I found this would not pay as well as selling it at the price then offered me, so contracts were made of from 5*l.* to 7*l.* a ton for the residue after picking out the large pieces." The ashes from the factories now produce are worth nearly 10,000*l.* a year after the large pieces have been picked out.

In examination by the committee, Colonel Bainbridge also expressed the opinion that the principal foremen of the factories were the persons to be blamed for the heavy waste of valuable material that has been going on for many years, but he afterwards stated that the superintendents of the separate factories were responsible, though they must, he thought, depend on their foremen "to report these things." He considered that the superintendents ought to have found out the waste if they "had been properly supplied with information," though he

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really see how the superintendent can go and grope at his factory and inspect his ash-heaps. It is surely the business of someone to tell him about it." The committee feel able to receive these explanations as satisfactory. An enormous waste of a valuable metal, such as brass, has been going on for many years, the total loss in connection with which is possibly 250,000*l.*, and yet the witness considers that responsible heads of the various factories can hardly be held accountable unless a subordinate, receiving weekly wages, is given attention to what is taking place. A residual of manufacture, which after full consideration had long been valued at 1*s.* 6*d.* a ton, and had recently been disposed of at 3*s.* 4*d.* a ton, is now sold to persons who bought 626 tons of it at the latter price for 6*s.* a ton, and even now there is no guarantee that the price given is adequate, because no analysis of the ashes has been made, and the witness does not deem it necessary to put the matter to such a test. If it had not been for the intelligent action of the police the probability is that the gross waste now being lost would still be going on unchecked.

The committee, whilst accepting the statement of Colonel Abbridge, that owing to the multitude of duties which the Chief Superintendent of the Ordnance Factories has to discharge, it is impossible for him to concern himself closely with details of business in the separate departments, cannot but think that the prevention of waste in those departments is not his direct, primary and obvious duty of the superintendent in immediate control, whether he has his attention called to the matter or not. It is evident to the committee that the reason for this heavy and constant waste has been permitted to occur is the want of the particular kind of knowledge and training required for the discharge of the duties of the posts to which they were appointed on the part of those who have been selected to occupy the chief positions of authority in the several manufacturing establishments which comprise the Royal Ordnance. The committee are strongly of opinion that the daily superintendence and management of these manufactories ought to be entrusted to persons without experience of the methods pursued by the outside trade in relation to the various processes carried on, with a view of securing the most economical and satisfactory general results. The business of works management is a profession in itself; and, as an almost invariable rule, those only are really qualified for it who have been trained in manufactories where the best methods and appliances for saving waste in every direction, and where the incentive of having to meet competition and to work to a profit are daily in

operation. It is to be remembered that all waste that takes place at the factories obviously results in increasing the cost of the articles produced; and, as that cost has much to do with determining the prices paid to private makers for similar articles, the importance of preventing extravagance and waste in production becomes the more manifest. The committee have thought it right to call special attention to the circumstances of this case as it appears to disclose a state of things to which an early and effectual remedy should be applied.

### SCIENCE AND INDUSTRY.

THE report of the special sub-committee of the London Technical Education Board on the application of science to industry has been issued.

Dealing first with the question of the loss of business, the committee state that they were unable to resist the conclusion that various branches of industry had during the past twenty or thirty years been lost to this country owing to the competition of foreign countries, and that in many others our manufacturers had fallen seriously behind our foreign rivals; that London in particular had distinctly suffered; and that these losses were to be attributed in no small degree to the superior scientific education provided in foreign countries. They referred to the transfer from England to Germany of numerous departments of manufacturing chemistry. The best known instance of loss was that of the manufacture of aniline dyes and many other valuable products from coal tar. The total exports from Germany of coal tar products now exceeded 4,000,000*l.* annually, of which about one-fourth came to the United Kingdom. The United Kingdom now paid annually over 3,000,000*l.* for imported chemical dye stuffs of one kind or another. As an instance of an industry in danger at the present time, the committee point to what has always been in part a London manufacture, that of pottery, especially of the finer kinds.

Dealing next with the causes of this loss of trade, the committee observe that all witnesses agreed in considering the relative backwardness of this country in scientific industries as due in the main to the deficiencies of our educational system. The glass industry had suffered from the inability of manufacturers to appreciate the value of science, from want of touch with scientific institutions, and especially from the want of an institution similar to the Physical Institute at Charlottenburg. The recently-established National Physical Laboratory would,



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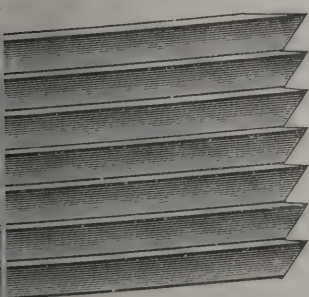
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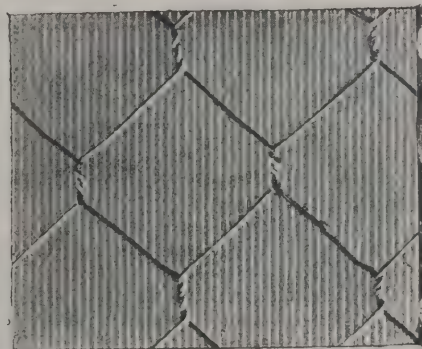
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it was hoped, now fulfil this want. That industries were affected by education was perhaps best proved by the vitality of scientific industries in those countries in which the system of secondary education was supplemented by scientific education of university rank, for the perfecting of which no expense was spared. Summing up all the evidence, the committee are convinced that the main causes of our relative failure in the chemical, optical and electrical industries are:—(a) The lack of scientific training of the manufacturers themselves and their consequent inability to recognise the importance of scientific assistance. (b) The defective condition of our secondary education, and the consequent lack of sufficiently prepared recruits for advanced technological training. (c) The lack of a sufficient supply of young men who have been trained in scientific principles and methods, and in the application of science to particular industrial processes. (d) The lack of any institution providing advanced technological training which is sufficiently endowed to enable it to give adequate attention to post-graduate or advanced work.

With regard to science training in the secondary school, the committee state that scientific industries have suffered in England not only through defects in higher scientific training, but to an even greater extent through defects in general and secondary education. They add:—"In the majority of secondary schools the curriculum has been so hampered by the exigencies of examining authorities and of examinations that the teacher has been compelled to devote undue attention to storing the minds of the students with facts for reproduction at the expense of the time which should be devoted to stimulating their reflective powers and making them think. In after life those who enter upon industrial pursuits too often regard science with distrust, and to some extent this distrust is merited, owing to the insufficient preparation and training of those who offer themselves for responsible posts in scientific industries."

Proceeding to deal with the question of science instruction at the university, the committee state that they have been impressed with the need for providing increased opportunities for the young chemist, electrician and engineer. Part of this provision was being made in the evening work of the polytechnics, from which a number of students annually took the degree of B.Sc. at the University of London; but there was a consensus of opinion that the highest grade of technical education must be carried on in an institution of university rank open during the day. The existing institutions of university rank in London were hampered by deficient endow-

ment, deficient accommodation, deficient teaching power, deficient equipment, and by the deficient preparatory training of the students. The improvement of equipment and strengthening of the teaching staffs could be effected partly by co-ordination and partly by securing to the institutions a moderate increase in their income from a reliable source.

Dealing with the development of advanced technology London, the committee express the opinion that the great need of London at the present time is the co-ordination of provision for the highest grades of education and the development of new departments, so that professors of the highest distinction and practical training should have under their supervision post-graduate or other advanced students carry out research work. The committee urge that the education of a leader of a scientific industry should include (1) a general education on the classical or modern side of secondary school up to the age of 17 or 18; (2) three years' training for the B.Sc. degree, followed by (3) two years' "post-graduate" work in order to obtain the D.Sc.

Concluding their report with a review of the work of the prospects of the Technical Education Board, the committee state that the expenditure required to put London in a position to equip itself as well as, say, Berlin, is altogether beyond the range of the sums with which the County Council entrusted the Technical Education Board, and even beyond the amount which it could legally spend on technical education. They were specially impressed by the need of higher salaries being provided for science teachers alike in secondary schools and university colleges, by the desirability of lowering the fees at the university colleges, and by the importance of extending the scholarship ladder in respect of exceptional students to a later age than was at present customary. They did not, however, feel able in the present financial position of the Board to press any specific recommendations. The cause of the want of vitality in our scientific industries was not far to seek; it was due to defects in secondary education and the lack of adequate provision for training and research. If secondary education could be more widely extended, if general and scientific education both in secondary schools and schools of university standing could be made more thorough, and if further opportunities could be provided to enable post-graduate and advanced students to obtain adequate training in technological research, there would be no reason to fear for the future prosperity of our scientific industries.



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# The Architect.

## THE WEEK.

THE gift of Osborne House in the Isle of Wight is a royal acknowledgment of the loyalty which has been shown to Queen VICTORIA as well as to HIS MAJESTY. It must be acknowledged that the building is better adapted for a convalescent home for officers than as a royal residence. It is only one of the supposititious Italian villas which were in vogue about sixty years ago. It might have been copied from one of the volumes which were prepared for the guidance of builders who erected dwellings for clients without calling in the aid of architects. Any interest which can be attached to the building is derived from its occupants, and not from its commonplace style. The historical associations of Osborne must always give it importance, but a British Sovereign should possess a maritime residence of a different class. There is another building which might also be utilised for benevolent purposes. As time goes on the unworthiness of Buckingham Palace to serve as the principal abode of the monarch becomes more and more evident. When it was first erected it was condemned, and it will not sustain the criticism of the improved knowledge of art which the country has acquired. A stately palace would exercise a beneficent influence, not only on England, but on the distant lands which look to London for examples of architectural skill which can be imitated.

WE have published the judgment of the Hon. ALFRED LYTTELTON, Recorder of Oxford, in the appeals against the assessment of the City Council of the colleges and university buildings (see *The Architect*, June 27). A "substitute building basis" was adopted by which each of the buildings involved was measured up, and an estimate was made of the cost of erecting another building that would be no less suitable. Mr. RYAN, the City Council's valuer, estimated the cost of the substituted building at an average of a shilling per cubic foot, while Mr. EVE, on behalf of the university, placed the value at ninepence per foot. The Recorder said he found by his own experience that new schools cost at least 1s. 2d. per cubic foot, and he therefore adopted the 1s. per cubic foot as a standard. The decision was generally in favour of the university and college authorities. Counsel for the assessment committee asked for time to consider the decision, as a special case might be applied for. That application was made a few days ago, but was refused by the Recorder. He said he had no power to submit questions of fact to the decision of the High Court. Counsel on both sides had consented to the "substituted buildings basis." It was now suggested that it was a novelty, but it had been accepted by Sir PETER EDLIN, who was a great authority on rating practice. Lord WATSON had said:—"There are principles of valuation which depend on purely legal considerations, and any misapplication of these is open to correction by the Courts. But there are also certain so-called principles of valuation which are simply formulæ for arriving at the solution of questions of fact which have commended themselves to valuers of experience. There may be several alternative formulæ of that kind, all of them capable of leading to a just and reasonable conclusion. It is for the arbitrator who is constituted a judge of the facts to determine for himself which rule of that kind he will accept for his guidance." To state a special case would be to embark the parties in further and fruitless expense. Under the circumstances, we suppose the assessment committee will accept the Recorder's judgment.

WE have already called attention to the difficulties of a surveyor whenever a member of a town or urban council became inimical to him. That was apropos of conduct at Winchester, by which a surveyor was compelled to resign his office. In another case, which has been tried at Birmingham Assizes, the surveyor, instead of resigning, was dismissed. He brought an action for slander against the Mayor of Tamworth. The plaintiff, Mr. CLARSON, was surveyor to the Rural District Council since 1879. In 1881 he was appointed as engineer to the waterworks, and in

1890 he became borough surveyor for Tamworth. Friction arose between the parties, and the defendant described the plaintiff as a curse to the town, an infamous one-man ruler, and on several occasions declared his resolve to ruin the surveyor. With so much provocation it was not to be expected that the words of the plaintiff should be of the meekest. Mr. Justice CHANNELL, who heard the case, said it was very unwise for officials to intervene in influencing the election of those who would be their masters, but seeing that the election cry last November at Tamworth was "CLARSON or no CLARSON," it was only human that the plaintiff should take an interest in the election. Tamworth was at one time rather notorious for the manner in which elections were conducted, and possibly bribery and corruption are in the air. An officer who was for so many years connected with Tamworth could hardly fail to be influential on those occasions, and it was probably believed excellent tactics for the defendant to utilise him. But when he declined, that was no reason for the threat being held out that he would sooner or later be ruined. The surveyor stated that his life during the past two years had been a perfect misery to him. The life of a public official was not a bed of roses; his had been like that of a galley-slave. It was given in evidence that the plaintiff had been most attentive and obliging whilst surveyor. The jury found a verdict for the plaintiff, and assessed the damages at 100l. The whole of the evidence suggested the ease with which prejudices can be excited against a surveyor and in course of time men will come to the conclusion that he must be unfaithful to the trust reposed in him. Damages have been obtained, it is true, but the friends of the defendant will no doubt subscribe the amount he is expected to pay. On the other hand, the surveyor has lost his appointment, for which the amount he is to receive will be an inadequate compensation.

THE programme of the City of Liverpool School of Architecture and Applied Art for the new session has appeared. The studio will open on October 2. Students who intend to join the classes should write to Professor SIMPSON and make an appointment before term begins, so as to be able to commence work without loss of time. They can either follow the three years' course leading to the degree of B.A., with honours in architecture, or the two years' course, at the end of which the college certificate is granted to successful students. The latter course has been in existence during eight years. The degree scheme was started last session. For the first time in England a student can obtain a degree in which a knowledge of architecture is combined with a knowledge of general subjects. Besides the architectural studio, there are also studios for sculpture and modelling, drawing and painting, and design. Evening classes are held for architectural designing, and there is a crafts school in which modelling, drawing, decorative design, wood-carving, wrought-ironwork, brass and copperwork, stained glass, enamelling, furniture and fittings, construction, are taught. In all of the classes the fees are almost nominal. The organisation is effective, and should have a beneficial effect on local architecture.

BUILDERS will be gratified by the decision which was given in the Court of Appeal on Tuesday last. An enlargement of Harrod's Stores is in progress, and, as is usual in all works of importance where expedition is essential, a steam crane is employed. Some of the residents in the neighbourhood applied for an injunction to restrain the crane from operating as early as 6.30 A.M. Mr. Justice BUCKLEY granted an injunction which would prevent the use of the crane before 7 A.M. The defendants appealed on the ground that they would suffer a serious penalty, as they would be paying a large number of men for half an hour in which no work could be executed. Lord Justice VAUGHAN WILLIAMS stated that the Court could not say that it was unreasonable to begin using a crane at 6.30 A.M. There was no vested right which secured people living in a residential street from being disturbed before 8 A.M. It was to the interest of everyone to have the work executed as quickly as possible. He thought that the injunction ought to be discharged. Lord Justice MATHEW agreed, and was of opinion there was no ground for the application or for the injunction.





PAINTERS' ARCHITECTURE: RAPHAEL.

### THE AMERICAN INSTITUTE OF ARCHITECTS.

THE official reports of the annual conventions of the American Institute of Architects enable us to obtain a glance at the state of art in the United States. When we compare the extent of surface which is represented on those occasions with our own little island, it seems wonderful that in America, with its "magnificent distances" between architects, there should be so much unanimity and loyalty to professional ideas. There are chapters in New York, Philadelphia, Illinois, Boston, Cincinnati, Baltimore, Rhode Island, San Francisco, Indianapolis, Washington, Michigan, St. Louis, Cleveland, Kansas, Buffalo, Pittsburg, Wisconsin, Colorado, Worcester, Minnesota, Brooklyn, Southern California, Dayton and New Jersey. Representatives from the majority of them attend at the conventions. But the immensity of the geography appears to have an influence on the practice of the members. An architect's office in an American city is, as the president, Mr. R. S. PEABODY, stated, like a plan factory. It is no longer possible for an architect to make every drawing for a building and to impart to it throughout his own touch and feeling. "Buildings of importance," continued Mr. PEABODY, "will not await one man's time. Modern building, and especially American building, implies a rapid campaign. Where it used to take ten years to spend a million dollars it now takes as many months, or the financier stands aghast as interest runs to waste. These modern building methods and the passion for costly structures are the exigencies from which have arisen the need of large office forces. As in business, trade has massed itself into great consolidation and combinations, so commercialism has brought new problems to our art. It is a surprising fact that in democratic America, of all places, a country where individual exertion and independent action is the mainspring of public life, the spirit of co-operation and combination has so largely supplanted in our art the productions of the individual." Owing to the circumstances of the case success depends in a great measure on the ability of the assistants, and it is believed that the new American office corresponds to a large extent with the French atelier, with its "Anciens." But there is no leisure for teaching the history of art or the theory of design, and on that account education in colleges has become an important question in America.

Mr. PEABODY declares that what can be considered as satisfactory in the position of architects is to some extent due to the American Institute. Many a man, said the President, "who cares little for it benefits because others have cared. Many a man, outside of our numbers, is more respected in his community and has a more certain livelihood because the Institute has proved itself a reasonable public body. Certainly through its influence the perils and hardships of competitions have been greatly mitigated. But all these are small and selfish ends. The real value of the Institute lies in its opportunities, in its openings for useful work and mutual high endeavour. Thanks to the

wisdom of its founders I think it has been a potent means of good. Thanks to them it has none of the features of a selfish trade union."

It is impossible for any one to enter the Institute except he passes an examination or possesses a degree from an accredited school of architecture. The subjects are construction, freehand drawing, history of architecture, elements of form, preliminary design. It is evident, however, from the reports that either the members must have an extraordinary number of commissions or that the majority of architects stand aloof from the Institute. There are only 395 fellows and 215 associates, which is a small total for so vast a territory.

The most important success of the Institute of late was in the appointment of a committee to report on the arrangement of the future buildings in Washington. The United States Government have had the papers read at the last convention printed, and it is expected they will be beneficial in persuading members of Congress to make provision for preserving the amenity of the national Capital. Although the success is only comparative, it is advised that the Institute should take a more prominent part in respect of the disposition of other cities, and should co-operate with societies that have been founded for their improvement. Apparently the recognition of the efforts of the Institute in Washington has emboldened the board of directors to undertake further means for controlling Government. At present official buildings come under the jurisdiction of several official departments. The War Department, the Navy Department, the District Commissioners, the Smithsonian Institute, the Attorney-General, besides various officers, exercise power over architecture in the district of Columbia. It is the opinion of the Institute that Government buildings ought to be administered by a supervising architect, or a bureau of architecture, and it is recommended that active steps should be taken to secure a law to that effect.

In spite of the fact that the Institute has ambitious projects such as would not be tolerated in a European country, there is no neglect of other matters which, probably, are of more account in the eyes of members. It is often complained in England that architects do not call on specialists to give advice as often as is desirable; but would clients willingly pay for the examinations and reports? The American Institute has decided that the following clause is to be added to the schedule of charges:—"Where heating, ventilating, mechanical, sanitary and electrical engineering problems in a building are of such a complicated nature as to require the assistance of an engineer, the owner is to pay for such assistance as the architect may require. Chemical and mechanical tests when required are also to be paid for by the owner." It has yet to be seen whether people who undertake building will agree to the change, and there is no doubt a more exact definition of an architect's duties will be demanded.

It will suggest the extent of building in America when



it is found that no less than 510,000 copies of the "uniform contract" recommended for general use by the Institute have been sold. It has been tested in the Courts, and no case is known of a judge regarding the conditions as illegal or ineffective. There is another subject about which there is less assurance of legality, that is, the extent to which combinations of steel and concrete can be legally controlled by letters patent. It is generally known that the use of Portland cement-concrete with tension members of steel or iron is on the increase. A committee of the Institute says that

The manner of combining the two is very simple, as simple as the combination of wood and iron in an ordinary roof truss, and there are several commercial shapes in steel or wrought-iron which can be used to give the necessary tensile strength, but unfortunately to nearly every combination that can be used with economy has been granted a patent. We believe that there are at present at least five different forms of floor construction based upon the principle of a composite beam or slab, upon which patents have been issued, notwithstanding that the principle of construction is identically the same in all, the variation being only in the shape of a tensile member. Now the point which we wish to raise is, "Can the exclusive right to the combination of ordinary Portland cement with steel in any of its commercial shapes be given to any one person?" or, in other words, "Can the patents that have been issued be enforced?" That this is a matter of great importance to architects must be evident to all, for if these patents can be maintained then it is impossible to secure open competition on any one of them, and the architect can only use them by paying the patentee his price. This will in a great measure prevent the use of what in many instances would be a very desirable form of construction.

It is therefore advised that the subject should be investigated and able legal opinion obtained as to what extent the patent laws apply to the use of steel and concrete in construction.

It was proposed to accept the following clauses for general adoption:—(1) The American Institute of Architects is of the opinion that a better result is always obtained by the direct appointment of an architect for any given work than by the selection of an architect by the process of competition. (2) The attempt to secure work by offering to prepare sketches or preliminary drawings, or to render full professional services at a less rate of compensation than another architect, is unprofessional conduct. But a difficulty arose about the document to which they should be attached. After a long discussion they were passed over; however, both are suggestive of the state of feeling among one class of American architects. It was also decided to utilise the exhibition which is to be held next year in St. Louis for a World's Congress of Architects. The State of Louisiana is not an unfitting place for foreign peoples to meet in, for it was possessed by the French, then made over to Spain, afterwards once more became French territory, and through fear that it might be taken by England, was sold to the United States for 15,000,000 dols.

It is impossible not to be struck by the economy with which the American Institute of Architects is conducted. All the expenses of printing, conventions, rent, salaries during the past year amounted to no more than 5,307 dols., or about 1,000/. It would be no easy task to discover another Society which performs equally efficient work and at as so much to show in the way of publications for as moderate an expenditure.

## THE HERIOT-WATT COLLEGE, EDINBURGH.

TECHNICAL education is a subject which has received extraordinary attention during late years. From the inquiries which have been made it might be easily imagined that a new class of beings to serve as teachers and students was about to be created. Great Britain has long possessed capable men in all branches of applied science, but what now appears to be required are some who will exceed them in power. It might also be supposed that the young folks who will be subjected to the new educational processes, whenever they are devised, will have unlimited time at their disposal to attend lectures and to work in laboratories. From the deliberations in which able people have taken part, we can conclude that teachers will henceforth have to deal with students of an ideal kind, and that the usual

difficulties which arise through natural defects are in some way to be rendered of no account. In the belief that a uniform course of education is practicable, it has been assumed that the teaching of universities can be combined in some mysterious manner with the training that is demanded for ordinary trades, so as to turn out alumni who will be at once specialists and omniscient.

The evidence which was given before the Royal Commission on University Education in Ireland affords remarkable examples of the lengths to which hopeful people can go when they attempt to solve a most perplexing social problem. In the scale of industrialism that country stands the lowest among all in Western Europe. What is desirable for the inhabitants is a course of training that would not handicap them in the competition with other people. For the majority of Irishmen the possession of the usual university education would resemble the professorship of ancient history in the Royal Academy to which GOLDSMITH was nominated, and which, with his characteristic good humour, he described as the giving of ruffles to a man who needed a shirt. What was required for Ireland was a commission with members who had distinguished themselves by the successful application of industrial knowledge, and who would be acquainted with the obstacles as well as the aids to its attainment. The University Commission, however, consisted of a couple of judges, an ex-Home Secretary, a bishop, two professors of Greek, an archæologist, a writer on a theological review and a medical doctor; there was also a scientific professor, but he retreated. Statesmen are allowed to exercise humour occasionally, but a more huge joke was never perpetrated by any Government than the appointment of gentlemen of that class to discover the causes of the backward condition of Irish agriculture and Irish manufactures, and to invent something which would bring about a revolution in them. The Commission would no doubt be effectual if education was intended to form men in which all qualities would be in due proportion, but for industrialism some quality must be dominant.

There was a subtle warning about what was to follow from the attempt of a body so constituted "to inquire into the present condition of the higher, general and technical education available in Ireland outside Trinity College, Dublin, and to report as to what reforms, if any, are desirable in order to render that education adequate to the needs of the Irish people," in what was said in respect of similar conditions of affairs in Greece by Professor MAHAFFY, who is one of the very few representatives of the Irish universities who have gained a reputation elsewhere. He said:—

I should like to call your attention to the mischief done by the University of Athens, which some twenty-five or thirty years ago, when I first went to Greece, established free education, and gave degrees without any fees at all to all clever people who liked to attend it. The result was that all sorts of adventurous poor came to the university from all parts of the Greek world, and lived as porters and as water-carriers and as sweepers of streets; they could afford only one text-book between three or four of them and one candle, and they used to read by turns during the night; one would read for two hours and then go to sleep, and then another would read for two hours. It was apparently a most delightful and pathetic thing to see the anxiety on the part of these persons for learning. But what was the result? The ordinary business of life was neglected, the fields even of Attica lay untilled, and those persons who had congregated together in Athens, and obtained education in the university, devoted themselves to politics, became political agitators, wrote articles in the newspapers and magazines, and ultimately became a most dangerous and turbulent element in Greek society. Your lordship may have seen recently the account of the riots led by university students in Athens, apropos of the publication of a version of the New Testament in modern Greek; and the remarkable feature of the thing is that they are not boys but middle-aged men who have neglected and given up their proper pursuits in life, gone to the university, and not being able to live honestly after getting their degrees, have become dangerous malcontents. I think the similarities between the modern Greek character and the Irish are so strong—I have noted two or three of them in my books—that I think you might fairly be afraid of some similar results in Ireland.

Similar results may also be apprehended in other countries besides Ireland unless a clear view is taken of



actualities. It is desirable that every human being should go through the most perfect course of education that is possible. The Greeks had noble examples among their heroic ancestors of the pursuit of knowledge under difficulties. CALLIMACHUS, the philosopher, and the poet of the renowned hymn to ZEUS, toiled as a water-carrier to earn money to pay fees, and had only a joint interest in a robe and a bed. But the days are gone when great men can live on a handful of olives and water as in ancient Greece, although the distinguished inquirers who formed the Royal Commission may be sceptical about the change.

If considered in the strong light of common sense, the statement which was made by Mr. F. GRANT OGILVIE, at present director of the Edinburgh Museum of Science and Art, about the Heriot-Watt College in Edinburgh, of which he was the principal, deserves most attention. It related to an experiment that is adapted to bring sorrow to all academical souls. But although without a precedent in ancient Greece, it has realised the end for which it was organised, and that is more than can be said of all university systems. Readers of the "Fortunes of Nigel" will recall GEORGE HERIOT, the goldsmith, who was King JAMES's financial adviser, and all visitors to Edinburgh who are architects have admired the hospital, school, or "work" which bears his name, and which some believe to have been designed by INIGO JONES. HERIOT died in 1624, and he left the sum of 24,000*l.* to the magistrates of Edinburgh to found an establishment for the education of orphans of freemen of the city. There was appropriateness in applying a part of the funds, which, it is needless to say, have been considerably augmented, towards the promotion of industrial and commercial skill. The college is also the possessor of any property which belonged to the Watt Institution and School of Art. The Heriot Trust in 1885 assumed the responsibility of the Heriot-Watt College. Originally, it is worth noting, the ministers of Edinburgh were all members of the Board; but ecclesiasticism has lost much of its power everywhere, and now there are only two representatives of the clergy. The other members belong to the Town Council or the University, the Royal Society, the Chamber of Commerce, the School Board. The Board did not seek advice by means of a costly Royal Commission, neither did they go to Greece or the Mediæval universities for models to imitate. They simply accepted things as they were before their eyes, and, realising the dearth of technical knowledge, and the difficulty of finding time or money to obtain instruction, they endeavoured to bring knowledge within the reach of the poorest and the busiest.

Under the circumstances, it was plain that the majority of students could only attend in the evening. Therefore, says Mr. OGILVIE, "the funds available for the College are specifically directed, first, to the developing of evening classes, and the work done in the College in the day classes has been conditioned by the fact that the endowment might not be used directly for their support, although the day classes are authorised to utilise all the provision in the way of buildings, apparatus, appliances and general expenses which are provided for the evening classes, that in itself constituting a valuable endowment for the day classes."

The success of the experiment is evident when we learn that no less than 3,800 students attend the classes. It was not assumed, as is the case too often in England, that this instruction is sufficient, for the work done in these classes takes account of the fact that the students are gaining practical experience in the workshops, offices or manufacturing of the district, so that it is distinctly co-ordinated with that training. At the same time the subjects are so advanced that students from the university join the classes which in some instances are more developed. There are day classes as well, where higher studies are followed, but it is possible for students of the evening classes to reach them through winning bursaries. Facilities are offered to students who are desirous of learning, and we are told it is not infrequent for a student to come to the College for one year in the day classes and then go to his apprenticeship, or practise in the workshop for two, three or even four years while he continues his work in the evening classes, and then return to the day classes at the end of that to take up more advanced matters of study.

The co-operative spirit is also strong in Scotland, and there is little of that jealousy or rivalry which is familiar in England. The engineering department of the Heriot-Watt College being more complete than that of the Edinburgh University, no attempt was made in the latter to excel the new institution. The classes have therefore been arranged as if both formed one institution. For example, a student in the university who wishes to graduate in electric engineering must work at the Heriot-Watt College. It is realised that by this method theory and practice can be combined; in consequence the diplomas of the Edinburgh University in engineering subjects will have a value that is not always given to English diplomas. There is, no doubt, a prejudice against evening classes, although it is well to remember that so conservative a university as the late Cardinal NEWMAN adopted them when arranging an experimental university in Dublin. What is done at the Heriot-Watt College can be made plain by a few figures. In the university course of natural philosophy 100 lectures are delivered; a similar course in the college consists of 12 lectures, 40 tutorial hours, and 120 hours in the laboratory or in all, 300 hours devoted to physics, and, in addition, mechanics occupied 120 hours.

Students who accept so much constant toil cannot fail to attain whatever is possible for well directed labour. But the professors must also have uncommon ardour. The desire is to seek men who are young, and who know the way to higher distinction. An important point is that the professors are also allowed to supplement teaching with practical work, especially in consultation. In that way the professors are always in relation with the business of the district. There can be no danger of the instruction becoming bookish theory or prattle without practice. In the section of commerce it is most difficult to secure men who are willing to teach. According to Mr. OGILVIE, the best men are induced to take up the work by their interest in it. Such men are generally too well off to care very much about the salary, but the College insists on paying them one, and then they feel bound to recognise that they have got to do the work. The crux of the matter is that good men must be secured or the student won't come. They are secured through their public interest. The man is generally a man of light and leading in his department, whose authority is recognised at once by those engaged in the subject, and is known to the students who attend the classes.

In Scotland at one time the most direct road to the university was through the church. A lad who was steady, industrious and intelligent would be considered by his parents, his schoolmaster, the parish minister as an eligible candidate for the ministry. Under the circumstances he could hardly fail to be of the same opinion. If he successfully passed examinations he was able to enter the university, and if he were capable of suffering privations could pass through all the grades. Sometimes the students realised that they were not fitted for an ecclesiastical career and followed another course of life. By the establishment of the Heriot-Watt College a wider road is complete. Smart boys in primary schools win bursaries to secondary schools, and if they are of a practical or scientific turn can join the Heriot-Watt College, and should they desire may eventually gain a place in the university. There is the closest and most cordial relationship between the two institutions. In Glasgow there is also a connection between the University and the Glasgow and West of Scotland College.

In all these arrangements there is no patronising on the part of the universities. It is felt that all places of education have a common purpose. Men are to be equipped to take part in the struggle for existence, and it is recognised that the mode of training must be suitable to the position in which they will have to be installed. But this harmony has been brought about without acrimonious discussion or agitation. Chief Baron PALLES, who was one of the witnesses before the Commission, and who advocated industrial and technical education in order to enable our countrymen to successfully compete with foreigners, has said that the unsettled state of the question has worked immeasurable injury in Ireland. In England there is no doubt that technical education is hampered by Government



regulations which are not suited to insure the success of students in competition with those in other countries. If the Heriot-Watt College had been from the first subjected to official rules and regulations, the evening classes would not be attended by nearly 4,000 students, and neither would it be tolerated that instruction should be given which was only adapted for those who had acquired more or less experience in offices or workshops. But in Scotland it is realised that business has an educational influence which it is desirable to utilise and to extend. It was characteristic of the English system when we find Mr. SIDNEY WEBB, chairman of the Technical Education Board of the London County Council, saying that "unfortunately in architecture, as in some other professions, we still retain the old status of pupil and master, which, I think, is not so good as more definitely-organised university instruction." A brief conversation with the Board of the Heriot-Watt College would have convinced him that with tact the relation between pupil and master could be made a factor in education and even become an auxiliary to university courses. But who can expect good sense in any department of the London County Council?

### MICHEL ANGELO AND MYTHOLOGY.

HERE were several of the contemporaries of MICHEL ANGELO whose orthodoxy was considered doubtful. One of them who was known in England, and who disfigured MICHEL ANGELO's countenance, was in Spain involved with the Inquisition on account of an act of irreverence towards one of his own figures. It was probably not the only deed of the kind of which the irascible TORRIGIANO was guilty. But MICHEL ANGELO has been ever accepted as a type of a Christian of the severest order. He was an admirer of SAVONAROLA, and, like the Dominican, he was not always obedient to the commands of a Pope. But in his poems we see the mystical turn of his mind, and one of his last sonnets, if not the last, was an appeal to CHRIST which is expressive of religious fervour.

MICHEL ANGELO, however, was the child of his time, and he could not avoid the influence of those survivals of Paganism which for years seemed to be inseparable from all manifestations of the Renaissance. It is difficult for us to realise the dual power which was then exercised over the minds of artists and writers. We can only compare it to the peculiarities of speech which were heard in England after the coming of the Normans. For a time there must have been a dialect which was partly Saxon and partly French. Men found it was practically beyond their power to express their thoughts in the old tongue, and by degrees the words of the invaders became indispensable for everyday wants. In the same manner not only mythological legends but mythological beings were turned to account by men whose lives were devoted to opposition to everything that was supposed to be remotely Pagan. Not so many years have elapsed since the old Roman custom of introducing the heads of oxen on the temples as symbols of sacrifices was abandoned in designing Christian churches. That was a relic of a system which was accepted as inevitable in the fifteenth and sixteenth centuries. The pagan symbols and the gods and goddesses who were adored prior to the introduction of Christianity were employed with the same ease as if they were part of a rhetorical language and were no more evil than Greek and Roman phrases.

The earliest legend about MICHEL ANGELO which has come down to us relates to his modelling a head of an old man. LORENZO DI MEDICI pointed out to him that the features were too perfect, and the young artist easily remedied the defect by a few blows of his mallet. It must be allowed at the memory of the first work which gained him notice never passed away from his mind. In modern times his *Moses*, which many regard as his noblest work, has been declared to be no more than a figure of a venerable man. When the length of the arms, which exceed those of men, was objected to in GOETHE's presence, he satirically replied that the sculptor made them long in order that they might support the tables of the law, and, moreover, MOSES was a commander, and for that purpose

lengthy arms were desirable. What are many of the demons in the great painting of the *Last Judgment* but satyrs of a low type? Satyrs are also introduced on the mausoleum of JULIUS II. in the church of St. Peter in Vinculis. His *Drunken Bacchus* is, in the opinion of some admirers, the most perfect of his works. There are also figures, paintings and drawings of such subjects as GANYMEDE, LEDA, VENUS and CUPID, HERCULES and the lion, the downfall of PHAETON, &c. In those days it was expected that an artist should grapple with those subjects as if they were established tests of skill. MICHEL ANGELO worked in wood and snow as well as in marble and bronze, for in his time a sculptor who confined himself to the use of one material was thought to be incomplete, and in the same way the great Florentine was fascinated, it may be, by the difficulty rather than by the appropriateness of a subject, and he was prepared to display equal fury or enthusiasm in the erection of mythological or scriptural subjects. The belief of the time warranted some of his experiments. It was regarded as appropriate when he placed the sibyls on the same level as the prophets in the Sistine Chapel, and that is not the only suggestion of antiquity to be found in the building.

Can it be said that the *Last Judgment* is in keeping with theology, or even with the interpretations of the subject by earlier Christian artists? In the Judge we have an entirely Pagan type—one that bears more resemblance to a young ZEUS than to the usual conception of the Founder of Christianity. With the exception of the figure of His Mother, who appears to shrink from the exhibition of power, there is not one among the hundreds of figures that is suggestive of a Paradise worth seeking after. The martyrs have not overcome human weakness, and seem as if they were soliciting revenge. CHARON, the ferryman, was by the Greeks sometimes described as bantering his passengers, who trembled on the voyage across the Styx. But they would have avoided exhibiting him as brutally using his oar on the unfortunate victims. This incident is by itself enough to reveal with how little of the Greek spirit MICHEL ANGELO was endowed. It is not merely in power of representing the human form that the Greeks were great; they had other qualities which were unattainable by artists of coarse fibre. The painting is an effort to combine Christianity and mythology, but it does not present the qualities which are characteristic of either, and however deserving of admiration it may be for the skill shown in the representation of action, it wants dignity and is therefore a failure, for it degrades scriptural teaching. In saying this we know we make ourselves liable to be considered as evidence of the artist's prophecy, "O quanto quest' opera mia ne vuole ingoffire." But the admiration of MICHEL ANGELO has become too indiscriminate, for in a painting much else is to be desired besides vigorous thews and sinews, and in our time muscularity alone seems to be appreciated.

In any city of Western Europe the employment of Christian and Pagan elements would appear more incongruous than in Rome. Within St. Peter's it is possible to discover unsuitable subjects in the decoration, and it suggests that the license of the Mediæval sculptors found its way across the Alps, and could not be overcome in the centre of ecclesiastical Rome. Artists, and those who looked on their works, considered the value of the representation more than compensated for any loss of unity. There seemed also a malicious pleasure with some of the patrons to shock the feelings of ascetics. The subjects which LORENZO DI MEDICI selected for representation were *The Twelve Labours of Hercules*, for POLLAJUOLO. GHIRLANDAIO was entrusted with the series relating to the marital misfortunes of VULCAN. LUCA SIGNORELLI, whose *Last Judgment* inspired MICHEL ANGELO, was favoured with a commission for nude Olympians, while BOTTICELLI made several versions of VENUS under his patron's directions. PONTORMO and MICHEL ANGELO co-operated in the production of a *Christ appearing to Magdalen* and a *Venus*, and we suppose the subjects presented themselves to their eyes as equally interesting. It may now seem anomalous that artists should engage in the production of works which were so widely separated by the character of the subjects. But in Florence



and Rome there was a peculiar indifference to the boundaries between sacred and profane art, and painters accepted commissions for one or the other class with a like satisfaction. In Venice those ancient subjects were of little account, or were superseded by anomalies of another kind. The city assumed the place occupied elsewhere by some heathen goddess. The glorification of Venice surpassed that of VENUS.

With the majority of painters a severe standard of judging is not applicable, but it is different with MICHEL ANGELO. He sympathised with SAVONAROLA when the prior endeavoured to prevent the Paganising of Christian art, but the fact remains that MICHEL ANGELO continued throughout his life, or at least until he became blind, to utilise Pagan ideas without the least remorse. His mind was sensitive, but in many ways he showed himself to be no more than a fallible mortal. His conspiracy with SEBASTIAN LUCIANI to diminish the reputation of RAPHAEL was a display of moral degeneration, and his combination of Pagan elements was another. His architectural freaks were signs also of weakness. But there was much in his character and his work which more than compensated for his correspondence with ordinary men.

### ITALIAN ANTIQUITIES.

THE British Consul in Naples, Mr. Neville-Rolfe, in his annual report to the Foreign Office, writes:—

For the last half century Cuma has yielded up treasures from its necropolis. The Count of Syracuse obtained a gallery of vases from it fifty years ago. Mr. Stevens succeeded him at a short interval. Both these collections are now the property of the nation. For the last few years of the work of Mr. Stevens nothing of great interest was found, and it was thought that the necropolis was exhausted, but an Italian landowner has begun again with praiseworthy perseverance; after finding a statue and other objects of the Greek period he came upon a tomb in which was a tortoise-shell disc, a unique object which experts pronounce to have been a mirror. This is not a very probable solution, tortoise-shell at the best being an inferior reflector. It is, of course, not impossible that it was the back of a mirror of which the reflecting surface has disappeared. The reflecting surface of ancient mirrors was silver plated on bronze, and such mirrors are frequently found in the tombs of Greek and Roman ladies with highly ornate backs made sometimes of silver, but usually of bronze and decorated with bas-reliefs or incised drawings. No tortoise-shell has ever been found before, and the question arises where it could have come from. The supply of the present day comes from Zanzibar and the West Indies, and no doubt in the present instance the object must have come from Africa.

In the neighbourhood of Cuma some further interesting tombs have been discovered, and these are thought to be pre-Hellenic. One of them contained objects in silver and bronze, besides being rich in ornaments made of electrum (gold alloyed with silver.) Electrum objects are rare, the great collection of them by Baron Marcello Spinelli having been found on his estate a few miles from Naples and considered till now unique. It has never occurred to anyone to call these objects pre-Hellenic before. A heavy silver casket was found in one tomb, but there are two others which were found by Mr. Stevens some years ago. The one now found is fastened with heavy nails. Some exquisite gold ornaments were found in this tomb.

Pompeii has only yielded one object of great importance, a small statue of Perseus about 20 inches high of very spirited execution. The subject is unique as far as ancient sculpture is concerned. A second bronze organ has also been discovered very similar to the one found some twenty years ago. They are in the form of a syrinx or Pandean pipe, but are so large that they must have been blown with a bellows or with a wind-bag like bag-pipes. There is very little doubt that the modern organ was evolved from the syrinx blown by mechanical means.

The entire reorganisation of the Naples Museum has been a great feature of the past year. A vast number of objects hitherto not exhibited have been brought to light, much more space has been granted, and many of the objects have been named, which is a great help to visitors. It has been an arduous work, and will probably not be finished for more than a year. It is not to be supposed that such a complete transformation could be carried out without evoking a great deal of criticism and opposition, and a special commission was eventually named to control the direction. To those who were acquainted with the museum as arranged before no new arrangement could be quite satisfactory, and the outcry of

"change for the sake of change" was sure to be raised, whether it was deserved or not. The entire museum was renumbered about sixteen years ago, and the new arrangement has thrown these numbers into utter confusion. It would be of great service to students were the collection renumbered separately—that is to say, if a series of numbers were given to the marbles, another to the frescoes, and so on, since by renumbering the museum as a whole we have now reached upwards of 120,000 exhibits, and such long numbers have manifest disadvantages for reference.

An arrangement has been made with the Italian Government in regard to the magnificent frescoes found on private ground at Boscoreale, near Pompeii, whereby some of the pictures will remain the property of the Government, and the remainder will be allowed to be exported. They have accordingly been sent to Paris, where Messrs. Cannessa, antiquity dealers, of 19 Rue Lafayette, will treat for their purchase. The Berlin Museum is said to have offered 40,000*l.* and expenses for them. The expenses amount to a very considerable sum, but the frescoes are of unexampled breadth of treatment and are in value far beyond any yet found.

Some interesting catacombs have been discovered running beneath the Monte di Dio in Naples. The entrance to them was discovered on pulling down some houses in Santa Lucia. They extend a long way into the hill and are probably of Roman period. As they have not been opened to the public no scientific account of them has yet appeared.

### EXCAVATIONS IN PALESTINE.

AN account has been given by Professor Sellin of the results of the excavations which he carried out in Palestine for the Vienna Academy of Sciences. During a previous visit to the Holy Land he had noticed a large mound, or small hill which he considered was probably of artificial origin, and might conceal the remains of some ruined city. On his return he induced the Academy of Sciences to provide him with the necessary funds to excavate the site. It lies near the village of Tanaak, one day's journey from Jaffa and three days from Jerusalem. The permission of the Sultan having been obtained, Professor Sellin started for Palestine again with the necessary equipment, and, after some little difficulty with the people of the locality, began his excavations on March 1, employing as many as 150 workmen.

Under the mound no fewer than four castles or fortresses were discovered. In the middle were the ruins of an Arabia castle, on the east a castle of the period of King Solomon, on the north-west one of a late Israelite period, whilst on the west was found the earliest of them all, one of pre-Israelite or Canaanite date. All the castles had been plundered before they were destroyed, so that no valuables were found, but objects of stone and clay and weapons were discovered, which assist in fixing the approximate date of the various buildings. The Canaanite castle is the oldest, built of unhewn blocks of stone, which show no marks of the chisel. Inside lay fragments of images such as are mentioned in the Bible, and also a number of small ornaments made of stone or earthenware, mostly representing beetles, scarabs and other insects and bearing inscriptions. There were, too, some rude weapons and vessels. The Professor puts the date of this castle at about 2,000 years before Christ, and suggests that it was destroyed by the Israelites, perhaps under Solomon, who proceeded to build their own fortress. Though this second building has also suffered considerably, enough remains to show that it belongs to the so-called Solomon castles. In both, curiously enough, were found idols, vessels and other objects belonging to religious rites, such as a sacrificial pillar of stone with an opening for libations, a stone altar, and—the most important find of all—an earthenware altar in the form of a throne, adorned with cherubim and lions. This is the only existing representation of cherubim of that date. They appear as human heads with a lion's body and wings.

The late Israelite castle appears to have been a fortress only. The Arabian castle shows more architectural skill than the others in its arches, &c., and recalls the style of the period of Haroun-al-Raschid. Vessels and lamps were found, and inscriptions of a religious character. Beneath the ruins of the castles human remains were found buried with vessels bearing inscriptions, while close to the Solomon castle a cemetery for children seems to have existed. Professor Sellin describes the excavation of the Canaanite castle as his chief feat, for though remains of such castles have been previously discovered by Englishmen, none have hitherto been completely laid bare. He is of opinion that he will now be able to draw a complete picture of the civilisation of the Israelites and Canaanites in Palestine. Most of the objects found have been sent to the museum in Constantinople, but efforts will be made to send some of them to Vienna.



## CORONATION RELICS.

A MEETING of the Sussex Archaeological Society was held in Hastings on Tuesday and Wednesday. At the *conversazione* several relics and illustrations relating to former coronations were exhibited. A paper was read by Mr. W. V. Crane, in which he said that the great historical ceremony which took place with so much glory on Saturday last, and at which the Mayor of Hastings represented the town, the premier Cinque Port, with so much honour and distinction, found a faint echo with them that day. The relics which surrounded the company were fragments saved from past coronations, and upon their history he wished to make a few remarks. The relics of the royal canopies were most interesting of all. Those now in Hastings were the only canopy relics which had been exhibited publicly of late years. The White Book of the Ports, which commenced in 1433, described the canopy to be held over Richard II. as follows:—"Un drap d'or, ou de soy, à la volonté du Roy, sur quatre lances batues d'argent." That was to say, a cloth of State made of gold or silk on four lances of beaten silver. The canopy held at the coronation of Queen Margaret of Anjou, the daughter of the King of Sicily, had four bells and staves, and these were given to the western Ports, Hastings, Winchelsea and Rye. After this the canopy, staves and bells became stereotyped in shape, but the descriptions used varied. "Drap" became "canapye," and lances became staves. Then appeared the bells and the tassels, which were used to fasten them to the corners. There were also decorations called "Knopps" (German, Knopp: a button), and also a *bague*, an expression used architecturally in Tudor times for a podlike finial or poppy-head. As to the canopy of later times, the picture they possessed of the canopy of Queen Charlotte, carried at the coronation of George III., resembled a tuft of ostrich feathers.

The canopies were the feudal pay for the services rendered by the Ports, and in pre-Reformation days the eastern Ports gave their shares to the shrine of St. Thomas of Canterbury and the western to Chichester Cathedral. Since the days of the Reformation the shares have become the private property of the canopy bearers, and in a general way the bearers kept the bells themselves, the staves were melted down and the cloth was divided. The oldest relic in the collection was a fragment from the canopy of Queen Anne, which until recently decorated the pulpit at All Saints Church, Hastings, the cloth being of plain scarlet and having a yellow fringe 5 inches long. At the Hastings Museum were relics of the canopy of George III., which had been lent by Sir Anchtel Ashburnham-Clements, Bart., a lineal descendant of William Ashburnham, M.P. for Hastings, and one of the canopy bearers at King George III's coronation. That family had been closely connected with Hastings since the days of Charles I., John Ashburnham being the Member for the town in 1628. The relics included a piece of the cloth of gold, in which silk formed the main warp, on which the gold threads of the woof appeared as an interlacing pattern of roses, buds and leaves. The bells, according to Sandford's "Coronation of James II.," were fastened by an ornamental double-looped bow outside the four corners of the canopy. The bells at the Hastings Museum were presented by Sarah, Countess of Waldegrave (formerly wife of Edward Milward, mayor of Hastings, and canopy-bearer to George IV.), to the South Kensington Museum, and were temporarily placed at the Hastings Museum by the Board of Education. Mr. Crane then proceeded to describe some illustrations of the bells borne on different canopies, and then, speaking of a silver canopy staff which was exhibited, pointed out that the top of the staff fitted into the canopy. It was, he stated, fixed with pins of some kind, which allowed the canopy to sway to and fro, the result being that at his coronation King George IV. preferred the risk of sunstroke to the danger of the canopy falling upon him.

They now came to the question of costume. In ancient sumptuary laws the costume was a matter of law, and the words "citizen's gown" prescribed the shape and material; no fur was allowed to a citizen, but lambswool only. Pictorial evidence showed the shape or gown worn by the barons, and documentary evidence proved the material. At the time of the coronation of James I. the sumptuary laws had been relaxed, and the citizen, though wearing the citizen's gown, indulged in rich materials—silks, satins and furs—at his pleasure. A townsman, or citizen, he remained, however rich in the material of his dress. The dress of the Cinque Ports barons who held the canopy of James I. was seen in an old contemporary print published in Knight's "England." Here the heavy though full gown and the hanging sleeve allowed the arm freedom to carry the canopy. It was described in the Romney records, and noted by Ross in reference to the coronation of James I.:—"It is decreed that every baron shall be apparelled in this sort: 1st, one scarlet gown down to the ankle, citizen's fashion, lined with satin." This gown is the mayor's gown, worn unchanged since those days till to-day. This gown was shown in Speed's "History," 1616, and described simply as the citizen's dress.

The dress was described in the account of George II.'s coronation as follows:—"The barons met October 11, 1727, and their habits were made in this mode:—The coat was made of the finest scarlet cloth, in fashion as a master's, and a pudding sleeve gown, only a longer train, and a large cape; it was faced with rich crimson sarsenet, the waistcoat was crimson sarsenet and faced with white sarsenet, and breeches of the same cloth. The stockings were of the finest scarlet worsted. The shoes were black velvet, and the cap the same." In the pictures of the coronation procession of James II. and the mode of carrying the canopy it was interesting to observe that there were six staves to the canopy, and sixteen bearers in some cases putting one hand to the staff, and all wearing the cap on the sleeve. They now came to the dress worn by Mr. W. P. Lamb when acting as a canopy-bearer to George IV. and representing the town of Rye. This family had long been important citizens of Rye, and the speaker said that he had found their names recently in correspondence dating from the time of George II. Mr. W. P. Lamb at one time had been presented by the people of Rye with a silver cup for raising a troop of light horse during the Napoleonic scare of invasion.

With regard to Mr. Lamb's costume, it was necessary to study the *coup d'œil* of the Abbey on the occasion of the coronation of George IV. One great object aimed at was magnificence and unity. This was gained in this way. One period was adopted, viz. the Tudor period, and the costumiers and artists of the time put all the knowledge current into the completion of the ideal. Mistakes were made, but no worse than the mistakes made by Sir Joshua Reynolds and Sir Thomas Lawrence. Added to this, nothing was spared in the way of expense. A mistake in the dress was the attempt to copy Sandford, the Lancaster Herald of James II., to whom everyone turned for the authenticated dress of each representative at a coronation, whether peer or commoner, prince or Sovereign. An attempt had been made to copy the hanging robe, and as it had not been understood the result had been a nondescript sort of Hussar jacket, which, though effective as a decoration, was not on an historical basis. The doublet and hose were effective, but the hat, he understood, had been lost.

## COLONIAL COPYRIGHT.

A DEPUTATION from the Society for the Protection of British Fine Art Copyright in the Colonies waited on Sir Wilfrid Laurier on the 8th inst. in connection with a decision in the Ontario Court of Appeal that a British copyright owner had no protection in Canada. Mr. Grundy pointed out that it had always been considered that Canada afforded protection to British copyrights duly registered in England, and this view was officially confirmed by the Canadian Minister of Agriculture, under whose department copyright laws came, in a letter of his dated 1889. Canada, by being a party to the Berne Convention, was afforded full protection in the various countries which were parties to that convention, and it was unfair that it should take every advantage and give nothing in return. The present decision had been arrived at owing to the law being drafted in a faulty manner. No vested interests would suffer by the Dominion of Canada's making its law reciprocal, but if piracy were legally permitted art in Canada would be sure to suffer. Others spoke in support of the request. A petition, headed by Sir Edward Poynter and signed by most of the Royal Academicians and many others interested in fine-art copyright, was handed to Sir Wilfrid Laurier. The latter promised to give the question his consideration, and to forward the petition to the responsible Minister in Canada.

## THE NATIONAL PORTRAIT GALLERY.

THE trustees of the National Portrait Gallery have received, under the will of the late Sir Arthur Seymour Sullivan, the portrait of that eminent musician, painted by Sir J. E. Millais, R.A. The trustees have decided to accept the bequest, suspending on this special occasion their usual rule as to the expiration of ten years from the date of decease. The portrait of Sir Arthur Sullivan, which had been deposited temporarily in the National Gallery of British Art, has now been removed to the National Portrait Gallery. The trustees have also accepted as a gift the fine portrait of the Very Rev. Henry Hart Milman, D.D., Dean of St. Paul's, the eminent writer and divine, painted by Mr. G. F. Watts, R.A., and presented by the dean's three sons, the Rev. William Henry Milman, Mr. Arthur Milman and the late Sir Archibald Milman, K.C.B. The trustees have also purchased from the executors of the late Miss Ann Smart a portrait, painted by Bradley, of her father, Sir George Thomas Smart, the musician, who conducted the music at the coronations of William IV. and Queen Victoria.



## NOTES AND COMMENTS.

THE prizes have been awarded by the advisory committee appointed to consider the essays and plans for the KING'S Sanatorium for tuberculosis. Dr. ARTHUR LATHAM obtains the first premium of 500*l.*; with him Mr. WILLIAM WEST is associated as architect. The second prize of 200*l.* was awarded to Dr. F. J. WETHERED, Messrs. LAW & ALLEN being the architects; and the third prize of 100*l.* was won by Dr. E. C. MORLAND, with Mr. G. MORLAND as architect. Essays by Dr. P. S. HICHENS (Mr. R. W. SCHULTZ, architect), Dr. TURBAN (Herr J. GROS, architect), Dr. JANE WALKER (Messrs. SMITH & BREWER, architects), and Dr. J. P. WILLS (Mr. WILLS, architect) were declared to be of great excellence. Although the competition was international, the successful essayists, with the exception of Dr. TURBAN, belong to this country. It is generally believed that a site between Fernhurst and Midhurst has been selected. The district was declared by WILLIAM COBBETT—and there was no better judge—to be probably the most beautiful in the South of England. It is elevated, which is an advantage in a medical sense, but it will be necessary, if the convenience of patients is considered, for new roads to be made which will not be trying to the lungs of sufferers. Another advantage of the site is derived from the pine trees which surround it, and which are generally held to be an aid in convalescence. The English Channel is not more than fifteen miles away. It is not likely that a more eligible site will be discovered than is found on Lords Common, which belongs to the Earl of EGDMONT.

HE was a shrewd witness who, in a case relating to the blistering of plaster which was recently tried in Birmingham, hesitated to give his evidence because, as he said, the action could have been settled out of Court in ten minutes while it occupied the Court for a couple of days. The circumstances revealed the need for more information about the chemistry of lime when used in building. The plaintiff, Mr. NEWELL, was a master plasterer, and he sought damages from the Aston Junction Company, Ltd., for breach of warranty. The plaintiff purchased 60 tons of Buxton lime from the company. It was found that some of the plastering in which the lime was used blistered or bubbled. The parts had to be taken out and replaced, which caused expense, and, moreover, the plaintiff's reputation suffered. When he complained the defendants wrote saying, "It would seem that you had some lime a little better burnt than usual, and did not give it sufficient time to slake in the pit. However we have cautioned our workpeople, and you will have no ground for complaint in the future." The question which had to be decided was whether sufficient time was given for slaking, or was the lime of inferior quality? The witnesses differed about the time required for mixing and for using the putty after it had been run into the beds. According to the plaintiff, the putty should lie in the bed from seven to fourteen days, but, provided the materials were good, it might not do any harm to use it in three or four days. Still, it would be safer not to do so. He denied that he had habitually used it seven or eight days after, or that in connection with a nurses' home he used it after it had been in the beds for only two days. Another witness held that Buxton lime plaster could be safely used three days after the bed was filled. The clerk of works at one of the buildings stated that he complained about the putty being used too soon after the running. Mr. COOPER WHITWELL, the architect, explained that when a small amount of blistering occurred it was usually supposed that some quantity of builders' lime had been accidentally blown or scattered into the putty. It would then begin to slake. Another cause was undue haste in using the putty before it had cooled, and in a third instance it might depend upon which part of the putty-bed the material was first taken from—near the sieve or right away from it. Some witnesses were very emphatic that with Buxton lime so much blistering should not arise. For the defence evidence was given that every ton of lime delivered came from Buxton, and witnesses who had used lime from the same consignment found that it answered perfectly well. At length the special jury declared that they did not wish to hear more evidence. To twelve men, the majority of

whom have no special acquaintance with building, the hearing of contradictory evidence imposes a strain on the attention which becomes intolerable. The judge asked if the jury were in favour of the defendants, and on receiving a reply in the affirmative judgment was given for the Aston Junction Company. It is a pity that in this case so competent an authority as Mr. Justice WALTON was not allowed to explain the law on the subject, for there were features in the case of unusual interest.

ALTHOUGH the London Building Act has several clauses respecting dangerous structures, there seems to be no control over the demolition of them. A petty sessions court may, "if of opinion that the structure is in such dangerous condition as to require immediate treatment make any order which such court may think fit with respect to the taking-down, repairing, or otherwise securing the structure." That, however, relates only to exceptional instances. In the demolition of an old house in Tottenham Court Road last week the floor gave way and one of the labourers was suffocated under the debris. At the inquest Mr. C. F. HAYWARD, the district surveyor, said he had no control over the demolition of old premises, which were generally pulled down in a very careless manner. The floor in this case should not have been laden with rubbish unless it had first been shored up. Mr. H. JONES, town clerk of Holborn, said that the borough surveyor had no jurisdiction over demolitions. The jury returned a verdict of "Accidental death," and added:—"The jurors, having heard in evidence that, in the demolition of houses there is danger in loading floors with rubbish unless previously tested and shored up, would condemn such practice, and they further consider that the district or borough surveyor should have jurisdiction over the pulling-down of houses and that, in doing so, all reasonable safeguards should be enforced." It would be no easy matter to obtain an alteration in the Building Act which would give control over the demolition of a building. But the new metropolitan borough should be allowed power to frame by-laws which would deal with emergencies outside that Act.

DR. JOACHIM has imparted a new lease of life to TARTINI's wonderful piece, which is commonly known as "The Devil's Sonata." The violinist therefore secured an interest in music-loving Germany for the picture which he seen in Munich, *Tartini's Dream*, by the painter JAMES MARSHALL. His name indicates that he was of English race, but by birth he was a Dutchman, having been born in Holland in 1838. The picture revealed a weird power, which was the more remarkable, for several of the painter's works are to be met with in churches, and at the time of his death he was engaged on one for the Lutheran church of Leipsic. MARSHALL was a pupil of the wall-painter PRELLER. Some of his paintings are in the Berlin National Gallery, as well as in the Dresden, Meissen and other public galleries. He was appointed professor of art in Breslau, but he could not escape from the power of the waywardness which often afflicts men of genius, and he was compelled to resign his office. His powers declined, and at length death released him from much misery a few days since. He has been introduced as a character in GERHART HAUPTMANN'S "Collegen Crampton."

## ILLUSTRATIONS.

LLOYD'S BUILDING, FENCHURCH STREET, E.C.—FULL LENGTH SIDE VIEW. HALF LENGTH SIDE VIEW.

CATHEDRAL SERIES.—HEREFORD: NORTH PORCH, SOUTH TOWER, SEPT AND CLOISTERS.

ADDITIONS, SOLSGIRTH, DOLLAR, N.B.

PROPOSED HOUSE ON THE MEDWAY.

PREMISES, 74 CHEAPSIDE, E.



## RYE AND WINCHELSEA.

THE town of Rye was selected this year as the headquarters of the Kent Archaeological Society's annual meeting.

### Rye Church.

The business meeting over, says the *South-Eastern Gazette*, the members paid a visit to the parish church of Rye, where they were welcomed in the name of the vicar (who is in South Africa) by the Rev. E. H. F. Jenner (*locum tenens*). The architecture of the church was described by Mr. J. Borrowman, jun., A.R.I.B.A. The building, he said, was a large one. Allen's history of Surrey and Sussex spoke of it as one of the largest in the kingdom, and other writers expressed the same opinion. In Horsfield's "Sussex" Jeakes was quoted as calling it the "goodliest edifice of its kind in Kent or Sussex, cathedrals excepted." There did not appear to be any record of the foundation of the church. He understood from Mr. Stenning that at one time it was attached to the abbey of Fécamp in Normandy, and he (Mr. Borrowman) agreed with him that some of the work had a strong French feeling. The church had suffered a great deal by reconstruction at various dates—some no doubt rendered necessary by damage inflicted by the French, the dates given being 1378 and 1448. There had also been neglect to contend with, as well as internal stresses due to the pressure of arches and roof. The measurements of the church were:—Extreme length on centre line inside, 156 feet 6 inches; length of nave, 71 feet 8 inches; width of nave and aisle west end, 57 feet 1 inch; extreme length over transept inside, 77 feet 3½ inches; length of chancel, 60 feet 1 inch; extreme width of chancel and aisles, 69 feet 10 inches. There were the three porches and no less than ten doorways, counting those in use at present and those built up. He considered that in Late Norman times the church was either on the present spot, but all traces of an earlier church had vanished. A great deal of the building was Late Norman and Transitional. He thought there was reason to believe that the usual method of starting the work at the east end was followed, and he should put the date at about 1120. Possibly some of the work was begun rather earlier, as in a built-up passage in the transept he came across a piece of Norman indented moulding somewhat earlier in style than the rest of the work. The upper parts of the transept and the nave were no doubt later, but all would probably date before 1180. The chancel aisles and part of the north arcade were Early English, the work being simple but of great beauty, dating from the beginning of the style, probably about 1200 in the case of the north aisle and about twenty years later for the south. There were some Late Decorated features, and most of the Perpendicular work agreed with the date given for the last destruction by the French in 1448. On the south side of the nave aisle was a Late Decorated doorway of very pleasing character. It led into a vaulted porch now used as a clergy vestry. Above the porch was an upper chamber which he had not been able to enter. He should imagine that this was used by a recluse or anchorite, and in that case it might not have had a door at all, as the window was large enough for the handing in of food, &c. The clock was a most interesting one, dating, he was informed, from 1540, and cost 180*l*. It had a Late Gothic iron frame with buttresses having embattled tops. The chancel consisted of three bays. Externally the building had a great feature in Perpendicular flying buttresses at the east end. It was seldom that flying buttresses were found springing as in this case from piers direct from the ground. The north aisle in the course of its history had been used for a variety of purposes not connected with the church, and had no doubt suffered much in consequence. Among other uses, as far as he had information, were a casual ward for homeless people, a butcher's shop, a fire-engine house and a depository for the town stocks and pillory.

The Rev. G. N. Godwin, B.D., of Appledore, then read a paper on "The Romance of Rye Church." The ancient Briton, he said, certainly paddled his own canoe in Rye waters and hauled his boat ashore somewhere near the present railway station, ate his meal of fish in a wattled hut in the present High Street, and came to the top of the rock to keep a sharp look-out over the surrounding waste of shallow waters. Then later some good but faithful soldier gave thanks over black bread and simple salad, and so the little church arose upon the hill top, and the faith of Christ became dear to the Celts. But when in 491 Ella Cissa besieged Andredsester, and slew all that dwelt therein so that not a single Briton was there left, the little church on Rye Hill perished in smoke and flame. But still the fishing went on, and one year, when the fisher-folk were starving, for no bread could be bought, a stranger came to Sussex—a stranger whom all men now honoured and blessed as the blessed St. Wilfrid. He borrowed the nets of the Sussex fishers, and presently they were full of 300 mighty fishes. Then came the sermon, and Rye Church was once more edified. Into that Saxon church, when Edward the Confessor held sway, there began to come French monks from Fécamp

in Normandy, they now being patrons of the living by Royal gift. These gave the name of St. Mary to Rye Church, in memory of their own stately church of Notre-Dame; the monks dabbled with State secrets, after being treated with forbearance for nearly 200 years, had the gift of Rye recalled in 1246 by Henry III. In the Norman church of Rye a familiar figure was that of John Lackland, brooding over the death of Prince Arthur and the consequent loss of Normandy: that wretched, restless man who changed his dwelling 200 times in a single year. When in 1246 the monks departed they exchanged their 100 salt pans, seven acres of meadow and the wood in which two pigs held revel for the manor of Chiltham, in Gloucestershire, and certain lands in Lincolnshire. "In 1250 the sea flowed twice without ebbing, and moreover the same sea appeared in the dark of the night to burn as if it had been on fire, and the waves to fight and strive together after a marvellous sort so that the mariners could not devise to save their ships by any cunning or shift which they could devise." Fifteen years later "Sir Simon the Righteous" lay dead and mutilated upon Evesham plain with many a brave son of Rye and Winchelsea around him. The same year altars were decked and the church made fair with the spoils of the ships, merchandise and goods of the traders of Bruges and Damme captured at sea by the men of "Winselye," Rye, and others of the Cinque Ports, who had a chronic weakness for piracy. Edward I., the greatest of the Plantagenets, knew Rye Church full well when he was building his fortress town of New Winchelsea, and was so busy therewith that he could not attend to prorogue Parliament in 1295. Eleanor of Castile, his Spanish wife, often prayed within Rye Church, and all the Canterbury pilgrims had been there. Full glad were these latter to ride, in company with the "Rippiers" of Rye, along the many roads to the shrine of St. Thomas of Canterbury. The "Schipman of Dertemonthe," of the barque *Magdelaine*, "who knew well all the havens as they were from Scotland to the Cape of Fynestere, and every creek in Bretagne and in Spain," came to church whenever he was in port, and Godwin of Rye, whose fortune the devil once made in a fit of good-humour, was, it was recorded in the British Museum, a regular attendant. Augustinian and Carmelite friars were familiar figures alike in the church and town, and many a miracle play had the church walls beheld, which plays were repeated at Lydd, Tenterden and the Romneys. In 1522 they read, "Paid for a coate made when the Resurrection was played at Easter for him that, in playing, represented the part of Almighty God, one shilling; ditto for making the stage for the Resurrection at Easter, three shillings and fourpence." In 1380 Rye was raided by the French and laid in ashes, the raiders even wrenching the bells from their fittings in the church and carrying them captive to France. But the men of Rye and Winchelsea, smarting under the dire disgrace, sailed for Normandy and, carrying fire and sword into both the coast and inland towns, afterwards rescued and brought home the bells, and once more they sounded out from the church tower. Rye had ever been the resort of strangers, and from 1538-44 mention was made of the burials of a Fleming, a Frenchman, a Spaniard, two Portuguese, a Dutchman and several men and boys from Scarborough, while all through the register occurred the words "Buried, a stranger." Fain would they believe that the altar in the St. Clair chapel came from the Armada as likewise the clock, but those legends must go, though it might well be that the altar was a Spanish prize captured by the privateersmen. Many a Huguenot worshipped in the church, and "Denis Duval" said, "Three miles off at Rye is another colony and church of our people, another fester burg where under Britannia's sheltering buckler we have been free to exercise our fathers' worship." In 1573 the bells rang merrily on the coming of Queen Elizabeth, and in 1642 the rumbling of the guns brought from Camber Castle by Captain Richard Cockeran and the men of Rye in the interest of Parliament was heard in the church. Admiral Blake was there in the stirring days when a hundred sail of the line lay at Rye, and Queen Anne, whose arms were to be seen in the church, was a great benefactress of it. Sainly John Wesley had paced the aisles and prayed in the church, and to this very day romance hung around it, for it was in charge of one (the Rev. E. H. F. Jenner), who had served his Queen and country at home and abroad, and its much esteemed vicar was still doing duty in Natal.

Under the guidance of Mr. Harold Sands and the Rev. G. N. Godwin the town was perambulated and the more interesting of the old buildings referred to. The two guides differed with regard to the Ypres tower, the Rev. G. N. Godwin attributing it to William de Ypres, Earl of Kent, who lived in the time of King Stephen, and Mr. Sands considering it to be of later date, probably about 1376. Having described the dimensions of the tower, Mr. Sands mentioned that the Corporation bought it in 1495, and that until 1891 it was used as a gaol. Proceeding, Mermaid Street was visited and a brief halt taken at the old house of the Jeakes in Baddyng's ward, reputed to be one of the oldest houses in Rye. Originally



this was the chapel of the Carmelite Friary, and it was one of the few buildings which escaped being burned by the French in 1378. It is now called the Old Hospital, because it was used as a hospital for prisoners during the French war. Opposite, Mr. Godwin called attention to Jeakes's storehouse, with its record of the position of the planets at the time it was erected. The old Mermaid inn—originally a large house running round a square courtyard with galleries—was next inspected, and moving into the High Street and thence to Cinque Ports Street Mr. Sands pointed out the remains of the town wall. The crossway on Conduit Hill, Mr. Sands said, was the spot where the postern gate once stood, and a little higher up were the remains of the chapel of the Austin Friars, or Friars Eremites, an order introduced into England in 1250. The chapel corresponded with the English Perpendicular period, but there were three beautiful Flamboyant tracery windows on the south side, windows which were very unusual in England. Coming near to the Landgate, Mr. Sands remarked that this was the finest landgate remaining in the south of England with the exception of Westgate at Canterbury. It formerly had a portcullis or drawbridge, and the remains of a fine stone machicolis were to be seen over the gate. Edward III. granted the license to fortify the town and build the gate in 1369, and low arches were cut through in the west tower below the loops for early cannon. Mr. Sands also pointed out the original line of the town wall, which ran from Westcliff end to the Strand Gate, and from there round to Baddyng's Gate. This gate was with several streets washed away, the town and cliff formerly extending over 100 yards further eastward.

#### Winchelsea.

Having partaken of lunch, the members were conveyed to that delightful old-world town, Winchelsea, where they spent a very pleasant time. At the parish church they were welcomed by the rector, the Rev. J. Patch, who briefly described the building. The church was anciently dedicated to St. Thomas à Becket. The only part now remaining was the ancient chancel, the nave having long since disappeared. The church was originally cruciform with a central tower, but there was no proof that the nave was ever actually completed. The town suffered at various dates from the French, and it had been suggested that in 1380 what was then existing of the nave was destroyed by the raiders, and that it was never afterwards rebuilt in any shape or form. The five monuments of the church were beautiful and extremely interesting. In Alard's chantry there were two to members of the Alard family—Stephen Alard, who was admiral of the Western fleet and Warden of the Cinque Ports about 1324, and Gervase Alard, who was the first to bear the title of admiral. The time of the latter was about 1303—nearly the same date as the church itself, 1288. Both monuments, which were originally richly coloured, were now considered unsafe, and would have at some future date to be reset. The remaining three monuments were in Farncombe's chantry, but half of one of the three was cut off from view by a thick wall erected for an unknown purpose. It was conjectured that the monuments were those of one of the Alards, his wife and only son. In what was now the chancel very interesting features in the form of a piscina and sedilia were discovered about fifty years ago on the removal of the pews belonging to the Mayor and Corporation of Winchelsea. It was thought that the wall he had mentioned might have been built from stones taken from the campanile, which stood in the churchyard till 1790, and that it was intended to put the bells upon it. Provision was made for them, but they were never hung. The tower was of much later date than the church. Whether any of the stones from the campanile were used in it, or whether the whole went for the building of Rye harbour no one really knew.

Under the guidance of Mr. Sands the members next strolled around the town inspecting the ancient mural defence of the place, while the Rev. Mr. Godwin pointed out numerous places of interest and gave information in regard to them. Starting from the Strand Gate Mr. Sands mentioned that old Winchelsea stood on a low, sandy island about the mouth of the present Rye harbour. The old town was partly swept away in a great storm in 1252, and the new town was founded by Edward I. in 1281, the charter being transferred to the new town. While the new town was building King Edward I. visited the place, and his horse being frightened by a mill leaped over the wall, to the consternation of the onlookers. By a daring piece of horsemanship, however, the king pulled up, and riding up one of the zigzag paths, was heartily cheered by his admiring subjects. The king reserved a site of some 10 acres in extent for a castle, but the only remembrance of it was the Castle field. Until 1828 there stood to the north-west of the Pipewell, or Ferry Gate, a large circular tower, called the Roundell, occupied in mediæval times by the harbour master. The Strand Gate itself had two drum towers and a central chamber above the wide span arch. The new gate on the Pett Road was now only represented by the remains of the lower part.

Close by this gate were the remains of the town ditch, the original Land, or Pipewell Gate on the Udimore Road was destroyed in 1380, and much damage was done to the walls when the French burned the town. The present Pipewell Gate was rebuilt by the then mayor, John Helde, in 1404. Camber Castle, which could be seen some little distance off, Mr. Sands explained, was built by Henry VIII. for artillery to guard the Camber, or harbour, of Rye and Winchelsea jointly. Mr. Godwin, in taking the members round, pointed out Miss Ellen Terry's cottage, the spot where Millais painted *Blind Girl*, showed them the famous cellars built in years ago by for the Gascony wine trade—one so large that Volunte had drilled in it—and a host of other deeply interesting places. He also pointed out the houses erected by the Huguenots, the old bear-baiting square, the remains of the Black Friars' monastery, the zigzag paths which were the only approaches when the place was practically a pirates' stronghold, and the position of the old harbour of Winchelsea, running round to the back of the town.

At the evening meeting two addresses were given, one by Mr. P. M. Johnson on "The Old Timber Houses of Kent and Sussex," the other by the Rev. W. Marshall on "The Woods and Roofs of Our Churches." Both were illustrated by means of lantern-slides. Mr. Johnson made an appeal to the Society to do its utmost to save the old timber houses which were dotted about the county of Kent. Unless some special attention was paid them they would, he was afraid, vanish rapidly. He knew of no complete house of the thirteenth century either in Kent or Sussex, but there were far more of the fourteenth century still remaining than many people supposed. Votes of thanks brought the meeting to a close.

#### RESTORATION IN VENICE.

THE correspondent of the *Scotsman* writing from Venice on the 2nd inst. says:—I am able to date this, although I am hardly able to tell the hour of the day, for since our Campanile fell our usual mid-day and nine o'clock evening time-gun has ceased firing, and since the "Commission for the Inspection of Monuments" has done its work, the bells in not a few of the other campaniles have been condemned to hold their tongues. Before, however, speaking of the work of the "Commission," let me give a few details regarding our "felled" Campanile.

The sifting and separation and removal of the 18,000 tons of debris goes on apace day by day from 5.30 in the morning till 7.30 in the evening. The work is done mainly by soldiers under the direction of two active young lieutenants, although a few civilians take their place while they rest in the middle of the day. On the spot, ancient bricks, modern bricks, marble and useless material are all separated. The latter is wheeled to the Riva dei Schiavoni and emptied into peati (large boats which, when full, a steamer tugs away out into the Adriatic Gulf, where the material is consigned to a watery grave. With the first boat-load went wreaths and flags, and it was consigned to the deep with almost funeral rites. The marbles and bricks are taken to the islands of San Giorgio Maggiore and Delle Grazie, but the most precious of them are taken into the quadrangle of the Doge's Palace, or into the office of the Commendatore Boni.

In the last-mentioned place Commendatore Boni shows me the other day a Roman brick, with the inscription "Im. Anto. Aug. Pius," which, of course, stands for Imperator Antoninus Augustus Pius, who reigned from 138 to 161 A.D. For his good qualities the Senate gave him the title Pius. Here then, is a brick in good condition that was made 1,750 years ago. Another brick had the letters T.A.M. clearly and deeply cut. One from Eraclea had the letters G.S.M.N. on it. The Aquileian bricks are of all shapes and sizes, some round and others as large as square paving tiles. Comm. Boni has polished a piece of a Roman brick, and one can hardly distinguish it from a piece of red Verona marble.

I said in a former article that the lime was bad, but it was not all equally so, for enormous masses of brick wall, weighing from 1 to 5 tons, are being discovered. The bricks comprising these masses it is almost impossible to separate. This has induced Comm. Boni to suggest that they should be taken entire to the public gardens, and there made into a sort of memorial monument, with the date of the Campanile's death—July 14, 1902. Signor Arbib, an Armenian who resides in Venice, offered 500 francs (20*l.*) for one of these blocks to place in his garden. Comm. Boni, although averse to making merchandise of the poor Campanile's remains, has yet written to the Minister Nasi and to the Syndic of Venice on the question of disposing thus of relics of the disaster.

The big Marangona bell is now deposited in the Doge's Palace, and it bears the following inscription:—"Sanctus fortis sanctus et immortalis, miserere nobis. Verbum caro factum est. Cancione Venete Fusoris meus, pondo lib. 7,600 Rifusione, terza nona Dicembre 1819."



Yesterday the great copper-gilt angel was examined, and inside it was found a glass bottle unbroken, with a parchment inside. The cork of the bottle had a string over it, and a seal of red wax with the one word, *Biblioteca* (perhaps for *Biblioteca Marciana*, St. Mark's Library). The parchment bore the following inscription:—"Curantib. xviris. præpos. fabr. Basil. Marcianæ Aloysius Zandomenighi Bonar. artium acad. magister opus finxit Barth. Ferrari Ant. Bosa socii idem probarunt. Joan. Casadoro sculptor sig. Franciscus Carissimi faber ferr. exequuti sunt, Gaspare Biondetti machinar. ad erectionem structore Caesare Fustinelli archit. omnia moderante. Venetiis A. MDCC. XXII. Emanuelis Ciconia." The first angel was, however, set up in 1517.

The four bronze statues—*Apollo*, *Minerva*, *Pace* and *Pallas*—that stood in niches by the bronze doors of Sansovino's Loggetto have all been found, and though *Apollo*, the last discovered, is the worst broken, the head, legs and hands being severed from the trunk, still all can be put together again.

The removal of the debris is now sufficiently advanced to show that the upper part of the Campanile fell in a direct line with the main door of St. Mark's, hitting the pavement of the Piazza about 50 feet from the church, and sending the angel almost in at the open door. But what a fall. At this point the pavement goes down into a pit, the flags being forced up all round. The Piazza resembles a wave of the sea, with its high, rounded crest and deep trough. How deep the trough is has not been ascertained, but the slope is 1 in 20. It happens that at this place there were drains, water and gas pipes, &c., so that the Piazza was partially a hollow.

Commendatore Boni does not think that the foundations of the Campanile have been at all injured, but in any case he will enlarge them, as they were not laid down at first to carry such a high and weighty tower as the Campanile was. At present they cover 200 square metres; he proposes enlarging them to cover 400. Money is coming in for the rebuilding more slowly than at first, but steadily, and it is expected soon that the sum of 2½ millions will be reached. Although it is, I believe, certain that the Campanile will be rebuilt where it was and as it was, still many people would like to see it built elsewhere—say, where the present unsightly patriarchal palace stands—so as to leave the great Piazza of St. Mark's free, and also to do away with the dwarfing of church and Doge's Palace, which was one effect produced by the Campanile standing where it did.

The damage to the Royal Palace is much more severe than was at first believed. The whole angle to the extent of 20 yards on either side is railed off. King Victor Emmanuel has signified his desire to bear the expense of this restoration.

To pass now to the report of the Commission for the Inspection of Venice Monuments. The fall of the Campanile suggested the thought that other towers and buildings might be in an unsatisfactory state, which has unfortunately proved to be the case.

1. *The Doge's Palace*.—I am not aware that anything new threatens its stability, but the weight of the books of the Marciana Library must be removed. As the old library—the Zecco (Mint)—is not ready to receive the books—indeed, the contract for its adaptation has but just been signed—the books will be taken to the Capella Nicoletta, a chapel attached to St. Mark's and the Doge's Palace, at once. This will cause some inconvenience and expense, but it will at once relieve the strain on the palace.

2. *The Procuratie Vecchie*.—This name is applied to the noble pile of building that forms the north side of the Piazza of St. Mark, and which is flanked at its eastern end by the famous Clock Tower. It is a colonnaded building, and in Gentile Bellini's picture of the Piazza, painted in 1496, it consists of the porticos below and one storey only over them. Now, of course, it is a storey higher. Many buildings in Venice have thus been enlarged on the old foundations, not meant to carry extra weight. Until the fall of the Republic the Procuratie Vecchie belonged to the State, and were used as the offices and dwelling-houses of the most honourable class of men in Venice, from amongst which the doges were always chosen, the Procurators of St. Mark. Afterwards they were sold to private individuals, and now they are used as shops and warehouses, cafés and hotels.

What then has happened? Inner walls have been taken down. Doors have been made here and windows there. The whole internal arrangements have been altered to meet the needs of trade and commerce. Besides which tons on tons of goods, a large part of which is glass, are stored in them. It is no wonder if then the old "Procuratie" feel the strain, and show signs of decay. Cracks have appeared, and though there is no danger of collapse, none whatever, still work of restoration is urgently needed. Commissioner Boni said he should like to see them turned into dwelling-houses, thus restoring them in great part to their original use.

3. *The Campanile of S. Stefano*.—The church and campanile and monastery of S. Stefano (St. Stephen, the proto-

martyr), dates back to the thirteenth century. They have a special interest for Protestants, for, as they were the only Augustinian buildings in Venice, Luther lodged in the convent, and it is believed preached in the church, on his way to Rome. Also the campanile has its special interest, for the upper half having been destroyed by lightning in 1585, and the very bells fused, four new bells were brought from England, from a destroyed Roman Catholic church or monastery.

The upper half of the campanile was rebuilt and the new bells hung, but it is precisely this part that now threatens to fall. It is nearly 6 feet out of plumb. The foundations and original part of the campanile are quite sound and safe, although the whole structure has been sinking during the past twenty years one centimetre a year. Commissioner Boni has ordered the demolition of the newer upper half of the campanile. At once the ringing of the bells was stopped. The people in the houses round the campanile, some thirteen families in all, have been removed. This was done not solely on account of the dangerous nature of the campanile, but because the houses themselves are in a state of complete disrepair.

4. *The Campanile of St. Barnabas*.—The church and campanile of St. Barnabas, the Son of Consolation, were first erected in 809, so they are one of the earliest foundations in Venice. They were burned in 1105 and rebuilt. The campanile was often struck by lightning, the last time about six years ago. On this account it is shorter than it once was. Commissioner Boni and the other members of the Commission have discovered that near its base there are cracks and bulgings. They have therefore ordered the cessation of the ringing of its bells, and they contemplate immediate repairs.

5. *The Campanile of San Francesco della Vigna*.—The name "San Francesco della Vigna" carries us back to the first century, for it was on the place so called that the evangelist St. Mark was wrecked in his boat as he was returning from Aquileia, and where he received the vision of an angel, who said, "Pax tibi, Marce, Evangelista meus" (Peace to thee, O Mark, my Evangelist), adding that a great city would one day arise in his honour, which was fulfilled when Venice was founded in 421 and dedicated to him in 829. It was an island covered with vineyards (*vigna*), in one of which a church was built in the ninth century to St. Mark, which was only destroyed in 1810. So up to that date there were two St. Mark churches in Venice. However, long before that monks of the Order of the "Minori Osservanti" had built a large church and monastery, and it is the campanile in connection with that later church of which we speak. It is a tall, rather slender, handsome structure, erected in 1581. It was struck by lightning in 1758 and restored in 1760. The "Commission" finds that this campanile stands in need of strengthening. Its bells, too, have been ordered to be quiet. Commissioner Boni says it may have been built too near the banks of some old canal. That sometimes accounts for movements and shiftings of buildings.

6. *The Bell Tower of the Arsenal*.—Even in the Arsenal itself buildings exist—walls of old shipbuilding yards and towers—that stand in need of repair, as they go back to the early years of the eleventh, twelfth, thirteenth and fourteenth centuries. The bell tower, that in which hung the modern "Marangona," that called the workers to their labours, has been condemned to undergo repairs. The bell has been swung to the topmast of a ship, and meantime does duty there.

7. *Church of Mater Domini*.—The church and campo of Santa Maria Mater Domini go back to 960. I always look upon the houses of the campo as the oldest in Venice. They have Byzantine windows, with a touch of Gothic, marking a transitional period, and above the apex of each window are crosses and animals and other Byzantine symbolism. The houses have deep projecting eaves, as those of Marco Polo have, and one goes down steps to enter the ground floor, the level of the campo having changed. The houses belonged to Zane, who was involved in the Trepola-Querina conspiracy, and the old well bears the Zane stem—a fox. The Council of Ten ordered in 1488 the destruction of the portico of the church, for a reason that throws a lurid light on the evil habits of the young Venetians of that period. The church contains some good pictures by Tintoretto, Calena and others; but it is dark and low and dismal, and the Commission report it to be in a positively deplorable condition. It will have to be closed, and thoroughly overhauled and restored.

8. *The Church of the Miracoli*.—This church of the Madonna Dei Miracoli is considered one of the most beautiful Renaissance churches in Italy. It was erected in 1484-89 by Pietro Lombardo, and it is encased outside in black and white marble. Inside it has a raised choir. It was closed for many years, and was reopened only in 1886, after having undergone repairs. It has a large dome roof, and this, it appears, is faulty in some ways. Accordingly, the Commission on Public Monuments has ordered the closing of the church and the doing of what is necessary to preserve this wonderfully beautiful little building.



9. Lastly, as might be expected, the Ghetto has called the attention of the Commission. This place not far from the railway station, on the Canal Canareggio, was originally the site of great public foundries; hence, it is said, the name Ghetto, from "gettare," to cast. Here the Jews were confined in 1516, and the name has become a general one for Jews' quarters. The houses here are very old and very high; some are regular "sky-scrapers," going up ten storeys. It is not to be wondered at that some of those houses have been condemned. They look dangerous even to the eye. The Jews are taking care of the expelled families, for the Ghetto is still a quarter for the poorer Jews. The synagogues are there. But the richer Jews are all over Venice, inhabiting the best palaces, as they are at the top of the tree in most professions. I can hardly think the condemned houses can belong to Jews, for whenever I see a house being put in order I am sure that a Jew has bought it.

The work of the "Commission for the Inspection of Venice Monuments" is almost over. In any case, nothing remains to be revealed in regard to Venetian campaniles, churches and houses than what I have made known. One naturally says it is enough. It looks formidable and alarming, but it is in reality not much.

When one thinks that Venice was founded 1,500 years ago; that it is built in the sea; that its houses have no natural solid ground to stand on; that every building rests on piles driven deep down into the shifting mud and sand; that all its structures, even St. Mark's Church and the Doge's Palace, are only built of brick dried in the sun or burned in the old guidecca kilns; that since the fall of the Republic in 1797, and even before that, Venice was but a playground, no serious care being taken of anything; that it is only really within the last thirty or forty years, since the unity and freedom of Italy was established, that public monuments, even like St. Mark's Church, are being cared for at all—when one thinks of all that, instead of being surprised that some of its spires and towers, its churches and houses, need more or less radical reparation, the wonder is that the city as a whole stands solid and strong, full of beauty of architectural design, full of marvellousness in skill of execution, a unique city, worthy of its unique history, as once the mistress of the seas, the Queen of the Adriatic.

### THE CONTESTED GOLD ORNAMENTS.

By ROBERT COCHRANE, F.S.A., M.R.I.A.

IN a remarkable paper by Mr. A. Evans, M.A., F.S.A., "On a votive deposit of Gold Objects found on the North-West Coast of Ireland," published in *Archæologia*, vol. lv. pp. 391-408, it is recorded that "the spot where the treasure was found is near the sea, on the north-west coast of Ireland." So much of interest attaches to the place and circumstances of this find, that the following details seem deserving of record; they will add to the scanty information as to locality given in Mr. Evans's paper.

The ornaments were found in a field on the farm of Mr. Joseph L. Gibson, in the townland of Broughter, parish of Tamlaght, barony of Keenaght, and county of Londonderry. This townland formed part of the estate of the Worshipful Company of Fishmongers of London until it was sold to the tenants a few years ago. At a visit to the place on May 22 of the present year, accompanied by the Rev. Joseph M'Keeffry, M.R.I.A., and Mr. S. F. Milligan, M.R.I.A., Mrs. Gibson, in the absence of her husband, kindly pointed out the spot in the field where the objects were found, and mentioned that this field was formerly divided into two by a fence and ditch, levelled some years ago. The northern portion of the field, before the fence was removed, was known as the "Church Field," and it was on the site of the fence enclosing this field that the objects were ploughed up in the year 1896.

Two ploughmen, named James Morrow (since deceased) and Thomas Nickle, were engaged subsoil ploughing—the second plough followed the first in the same track for the purpose of turning up an increased depth of the soil; the process is called subsoil ploughing, or subsoiling. The second plough exposed the objects, and, in doing so, slightly injured one of them—the boat.

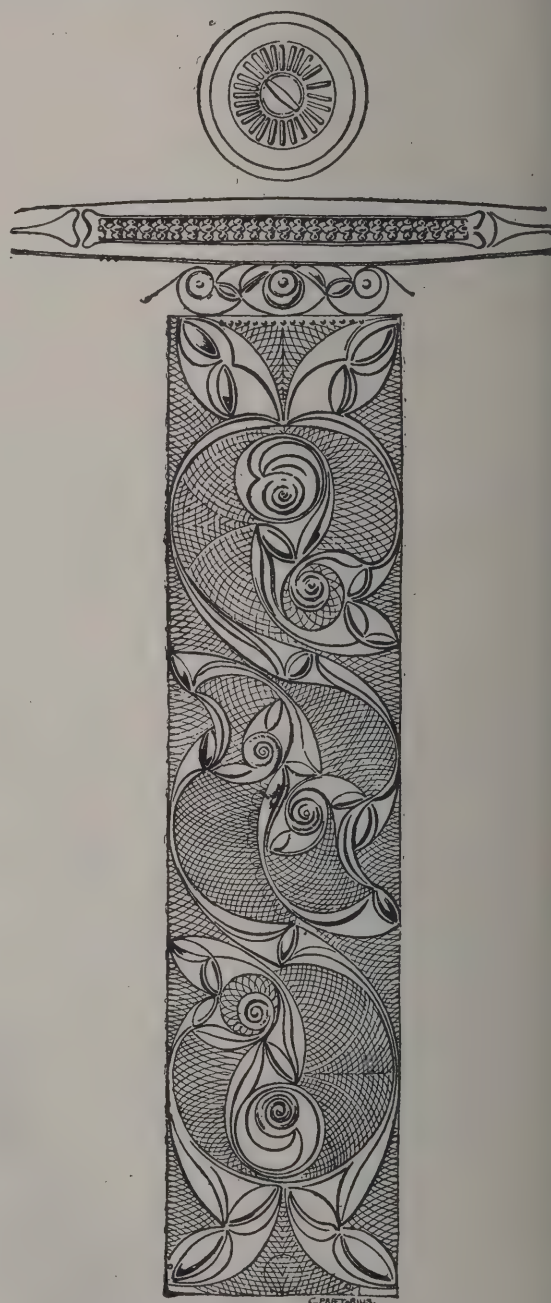
The find consisted of—(1) a representation of a boat of the currach type, in part like those on the river Boyne, but with the ends more pointed and in part like the currachs of the west coast; (2) a bowl or cup; (3) small chains of gold, and (4) a hollow collar of gold, a twisted necklet and the fragment of another necklet. These objects became the property of Mr. Robert Day, F.S.A., M.R.I.A., of Cork, and from him they were purchased by the Trustees of the British Museum.

On the Sunday after the day of the find one of the ploughmen, James Morrow, in walking over the spot where the objects were discovered, picked up a broken piece, believed to be a missing portion of the boat, which he gave to his sister, who sold it to a jeweller in Londonderry and it is not now available for description.

From Mr. Evans's paper above referred to, I have taken the following measurements and weights of the various articles:—

1. The boat measures  $7\frac{1}{4}$  inches long by 3 inches broad and weighs 3 ozs. 5 dwts.; it had nine seats for the rowers, which only eight now exist (the ninth having been disposed of to a jeweller, as before mentioned). The boat is formed of sheet of pale gold plate divided and rejoined at prow and stern. There are some faint marks on the sides having the appearance of ribs, which may have been meant to indicate the frame work covered with hide or canvas. Adamnan, in his "Life of St. Columba," mentions such boats were in use at Iona in the sixth century. The ribs and frame were of wood, covered with ox hides, tanned with oak bark; sometimes three layers of hides were used. Adamnan mentions that these boats carried full sails. The central seat had a hole into which a small mast was secured; the rowlocks were formed of wire rings. Fifteen small oars about  $2\frac{1}{4}$  inches in length were found, and steering oar. Mr. Evans says:—"Besides the oars there were found a miniature grappling-iron, with four hooks, a boat hook and three forked implements, which may either be fishing spears, or, more probably, forked barge poles, such as are still in use."

2. The bowl measures  $3\frac{1}{2}$  inches in diameter and about 2 inches in depth; it is of semi-globular form beaten out of plate of pale gold, and weighs 1 oz. 5 dwts. 12 grs. Four small rings are let into the rim, at equal distances apart, evidently for the purpose of suspending the bowl.



DETAIL OF ORNAMENT ON GOLD COLLAR, SHOWING DIVERGENT SPIRAL PATTERN (Plan of Fastening at Top of Figure.) ( $\frac{1}{4}$  Linear.)

3. The Chains.—The following is an extract from a lengthy description by Mr. Evans:—

"The larger chain consists of three separate strands, each

\* *Archæologia*, vol. lv. p. 392.

† *Op. cit.* p. 394.



formed of quadruple links, joined together by what may be called the bolt ends of the necklace. It is  $14\frac{1}{4}$  inches in length, of a dull gold, of different alloy from that of the boat and bowl, and it weighs 2 ozs. 7 dwts. The fastening is a regular bolt, a double pin sliding in and out of a loop. The outside of this lock is ornamented with granules, some of them arranged in pyramids of three. The chain itself is of exquisite fabric and the links are all spirally twisted. The smaller chain, which is  $16\frac{1}{2}$  inches in length, consists of a most complicated plaitwork of eight wires. It weighs 6 dwts. 12 grs., and is of the same poor gold as the other. Its fastening is on the same principle."

In general character these chains resemble the silver chain attached to the Clonmacnoise brooch-pin, described and illustrated by me in the *Journal of the Royal Society of Antiquaries of Ireland*, vol. xxi. p. 318.

4. *The Collar*.—This ornament is a most remarkable specimen of its kind, and is of the so-called "late Celtic" period. The collar when closed would form a circle about  $7\frac{1}{2}$  inches in diameter, the hollow ring or tube measuring  $1\frac{1}{2}$  inches in thickness. It was formed of two plates of gold, which corresponded exactly with each other, and were folded over and soldered together on an internal core now removed. A portion of the collar for about 2 inches in length is missing. An ingenious attachment is formed at each of the ends for the purpose of fastening them together; a projection at one extremity is inserted into a slot at the other end, which locks it until one end is turned at right angles to the other to open it. The decoration is formed of repoussé work of beautiful design, with lines of divergent spiral pattern grouped together most harmoniously. Between the lines of the raised pattern the vacant space or background of the design is covered with finely-engraved concentric lines sunk in the surface; they appear to have been executed with the aid of a compass. The period between the late Celtic of, say, the first century, and the Christian trumpet pattern of the seventh and eighth centuries, has not yet been filled up, and the older style of ornament survived longer than is generally thought. In "Notes on Irish Architecture," by Edwin, third Earl of Dunraven, edited by Margaret Stokes, at page 199, vol. ii. is the following, which bears on this point:—"This is termed the divergent spiral, or trumpet pattern, and its appearance in the art of Ireland from the bronze works of the Early Celtic period found in the stone tombs of a prehistoric age to the capitals of Cormac's chapel, stamps the architecture of Ireland with a distinctive native character. Living on in Ireland when it had died out elsewhere, this design, in course of time, appears upon her buildings."

In addition to the foregoing a twisted necklet or torque, about 5 inches in diameter, was found. It weighs 3 ozs. 7 dwts. 9 grs.; also the fragment of another torque of similar design, weighing 1 oz. 10 dwts. 4 grs.

The object of this paper is the more particularly to describe the locality where they were found and its surroundings, from which some light may be thrown on the subject of these ornaments being *ex voto*.

I have already mentioned that the northern half of the field within which the objects were found is still known as the "Church Field." A field immediately adjoining to the westward and between the "Church Field" and the sea is known on the farm as the "Graveyard Field," and in the latter field bones are frequently dug up. There is a tradition in the neighbourhood that a monastery once stood here, and these circumstances would tend to show that an ancient ecclesiastical foundation at one time existed at this place. If so the monastery must have been one of the early Celtic type; there are no historical accounts that I am aware of recording such a foundation.

The next subject for investigation is the name of the townland. Broighter at first sight looks puzzling, and not likely to yield any satisfactory results. Local inquiry and the aid of the Ordnance Survey maps showed that the townland immediately south of Broighter is named Broglasco, and the next townland is named Broharris. The prefix Bro to three townlands suggested the derivation of each: thus Bro-glas-co, or Brogh-glas-chuaidh, means the "Brugh, or Great House of the Green Hollow." This townland is considerably lower as regards level than Broighter. In Broharris, which seventy years ago, according to O'Donovan, was called Broharri, we have evidently in the latter part a proper name; and in Broighter, or Brogh-iochtar, we have the Lower Brogh or Great House. The term "lower" does not apply to level or relative height; it indicates the northern position with reference to the other Bros. I have had the advantage of Dr. Joyce's valuable assistance in arriving at these derivations. As regards level or height, the townland of Broighter is higher than the lands lying to the south and west of it.

As to the other physical characteristics of this townland, it was formerly bounded on the west by the strand and shores of Lough Foyle. An embankment was made here some years ago which reclaimed a large tract of country. Some unneces-

sary misconception seems to exist as to the extent and situation of the land reclaimed from the sea. The embankment referred to was finished about the year 1855 under the Act of Parliament for the construction of the Londonderry and Coleraine Railway, which in some places ran through the slob lands of Lough Foyle. The contractor for the railway (Dargan, of the first Dublin Exhibition fame) got the reclaimed land in part payment for making the line. No portion of the townland of Broighter was included in this or any other reclamation scheme. The reclaimed portion immediately west of Broighter now forms a separate townland, for which it was necessary to invent a new name, and it has been called "Ballykelly Level," Ballykelly being the name of one of the townlands adjoining.

The townland of Broighter, though low-lying—the highest portion of it is under the 25 feet contour line of the Ordnance Survey—could not have been under the sea-level in the historic period. Its name, with the prefix Bro, goes back to very early times, and it undoubtedly came into use in the pre-Christian period. Brugh, or Brogh-na-Boinne, was the name applied to one of the chief cemeteries of pre-Christian times, and it still survives, in the names "Bro Farm" and the "Bro Mill," at Newgrange, on the banks of the river Boyne, near Drogheda.

I would take it therefore that the name was applied to this place in pagan times, and it was then solid land; also that at an early period after the introduction of Christianity a religious establishment was founded here of the older Irish type, a church with a few cells, probably wattled huts, surrounding it, in which the monks lived, each in his own cell, in the early monastic fashion, and it probably survived until the introduction of the later monastic orders. However this may be, the only thing certain is that some such establishment existed, and that it has been completely blotted out of existence and forgotten save in the local tradition. I would not, however, be disposed to rely too much on "local tradition." While fully appreciating the value of such evidence when properly investigated, I have too frequently, in my experience, found it can be "made to order." It is natural to connect the find with the establishment said to have existed here (which existence the place-names before referred to fully verify), and before its downfall its treasures may have been buried in the site either accidentally or by design and remained there until recently recovered.

The question arises as to how this place could have become possessed of such treasures. The answer to this is plain. The custom of making votive offerings to churches of articles of value has been practised in the Western Church from the earliest times, and these golden ornaments may have formed part of the church treasury of Brogh-iochtar, which probably suffered the usual fate of monasteries in Ireland at the hands of the Danes. In the ninth century alone the recorded invasions of the country along this coast are not less than four in number, viz. A.D. 822 (Banagher plundered), A.D. 839, invasion of Turgesius (Maghera plundered), A.D. 841 and A.D. 861. Broighter lies between the sea and Banagher. We find recorded in the "Annals of the Four Masters" that the Danes plundered the neighbouring churches of Enagh, Clooney and Dergbruagh in 1197; and in 1196, according to the "Annals of Boyle," the altar of the great church of Derry "was robbed of 314 cups esteemed the best of their kind in Ireland."

Reverting again to a consideration of its geographical position, we find it lying within a mile of the river Roe, and about two miles from the famed hill of Drumceat—Drum Cette—at which the great convention of that name was held in A.D. 575, according to Dr. O'Donovan, or in 596 by Dr. Reeves.\* This hill is now named "Daisy Hill," or the Mullagh, and the name Drumceat has disappeared. The name of the hill, as given by Colgan, is Drui-m-Cette, pronounced Drum-Ket-ta. The word Drumceat was first used by Dr. Reeves. The disappearance of the name has given rise to doubts as to whether the hill in Roe Park, now called the Mullagh, was the original hill on which the convention was held. The Most Rev. Dr. O'Doherty, in an able pamphlet published by the Catholic Truth Society, gives it as his opinion that the convention was held not on the Mullagh, but on the hill of Enagh, on the opposite or eastern bank of the Roe. It is recorded that the convention was attended by 10,000 or 12,000 persons, called together by Aed Mac Ainmirech, king of all Ireland, who came from his residence at Aileach, and the assemblage consisted of the other kings, chieftains, nobles, with the clergy, bards and a great following of horse and foot. The two hills are not half a mile apart, and it is evident that such a numerous party, encamped for upwards of a year, must have covered both hills and all the intervening ground, and the ground along both banks of the river for a considerable distance, including the site of the ancient town of Limavady. It would, therefore, be equally correct to describe the meeting as

\* Colton's "Visitation of Derry."



having been at either place—the Mullagh or the Enagh. The hill in Roe Park, now called the Mullagh, is 182 feet above Ordnance datum, and it gives its name to the townland in which it is situated. The ridge is formed by glacial deposits of gravel, and is an "Esker" similar in most respects to those in the chain of Esker drifts which run east and west across the central plain of Ireland. The end of the ridge is called by the more modern name of "Daisy Hill."

The word drum, or ridge, correctly described this hill; cetto, or cette, I take to be a proper name. The ridge runs nearly due north and south through the demesne of Roe Park for a distance of 460 yards. At its southern end there are indications of an artificial formation, where the top of the ridge has been cut off and a level plateau of irregular oval shape, measuring about 200 feet by 100 feet, has been artificially formed. The excavated material was deposited chiefly at the northern end, where there is a considerable artificial slope but no fosse or ditch. This elevated platform is not surrounded by such protection, and in this respect is unlike most other earthworks of the kind that I am aware of. Some burial mounds have no enclosing ditch, but this is not such a mound. It seems constructed for the purpose of allowing a large number of persons to collect on the level top. This they could not have done with facility on the natural ridge.

The change of name from Druim Cette to the Mullagh could be accounted for by the structural change; it ceased to be a drum or ridge, and became the Mullagh—that is "The Hill" par excellence—after the famous convention had been held there. Possibly the structural change had been made in it to facilitate the holding of the convention.

This is somewhat of a digression, but it is desirable to locate the position on the banks of the river Roe on which the meeting was held. The length of the river is about eight miles from the Hill of Drumceat to the sea, and it is navigable for boats, there being no ford or obstruction for the whole of that distance. At Drumceat there is a ford which, no doubt, was used by the multitude at the convention. There is no ford between it and the sea, and the river, though navigable below, except in very dry periods, is not navigable above Drumceat.

It is recorded by Colgan that St. Columba, with the Scottish king, attended this convention uninvited, and that he sailed from Iona, was nearly shipwrecked in Lough Foyle, near the mouth of the river Roe, and, by a miracle, his frail barque was brought on a flood up the river. Eventually he was enabled to land in safety near the Hill of the Convention to attend and take an important part in the proceedings. Dr. Reeves, in his "Antiquities of Down and Connor" (Appendix), says:—"In the year 596 was convened a council at Drumceat, on the river Roe, one great object of which was to arbitrate between the respective claims of Aedh, king of Ireland, and Aidan, king of the British Scots, to the kingdom of Dalriada, in Scotland. And hither Columbkille also came from his monastery at Hy, attended by a company, which is thus described by his contemporary, Dallan Forgaill:—

'Two score priests was their number,  
Twenty bishops of excellence and worth,  
For singing psalms—a practice without blame;  
Fifty deacons and thirty students.'

(See also Connellan's "Annals of the Four Masters," notes by MacDermott, pp. 51, 246, 439, 550 on this convention.)

O'Curry mentions that the Irish king, Aedh, had "invited" St. Columba to be present at this convention. See p. 77, vol. ii. "Manners and Customs of the Ancient Irish":—"This great meeting was attended by all the provincial kings, and by all the chiefs and nobles of the island; and Aedh invited over from Iona the great patron of his race, St. Colum Cille, to have the benefit of his wise councils in the discussions." But at p. 245, vol. iii. "Manners and Customs of the Ancient Irish," it is said:—"St. Columbkille, having heard of this meeting and its objects, and being a great patron of literature, came over from his island home at I, or Iona, whither he had retired from the world to appease the king and the people, and quite unexpectedly appeared at the meeting. The poets at this time, with Dallan Forgaill as their chief, were collected in all their numbers in the vicinity of the hill of meeting anxiously awaiting their fate, but their anxiety was soon relieved, as their able advocate had so much influence with the monarch and his people as to procure a satisfactory termination to the misunderstanding between them and their poets."

There are other historical references to the visit of St. Columba to this place at this time, which need not be here quoted, as the fact of his being present is undisputed.

The incidents of his journey to the place of meeting are worthy of attention. It is recorded that the saint, after sailing across Lough Foyle, turned his vessel to the river Roe, and that, with the Divine assistance, it glided up the stream, which with the scantiness of its waters would otherwise not have been navigable so easily. The saint landed very near Drumceat, at a place which was named Cabhan-an-Churaidh, or "hills of the boat."

There is a rock in the river at Roe Park called the "boat rock," and there is a pool called the "boat hole." I have not heard that either of these places have been connected by tradition or otherwise with St. Columba's visit. Pleasure boats are kept on the river and for ferrying purposes, so that the names may be of local or comparatively recent application.

It is not necessary to rely on the miraculous portions of the account of the saint's visit; as already mentioned, the river Roe is navigable for small boats up to the Mullagh, and ordinary tides reach for nearly half the distance. If in addition to a high tide the river had slightly increased in volume in its upper part, and as the fall is slight and the land through which it flows are flat, the voyage could have been made without the aid of a miracle. The point to note is that the circumstances must have created an impression at the time which later on culminated in the event being ascribed to a miracle.

There is no doubt there is a substratum of fact in the story of the dangers attending the voyage of St. Columba, who was accompanied by Aidan, king of the Albanian Scots, and his followers, and a sense of thankfulness on the part of some of their safe deliverance may have prompted the gift of the votive offering to some of the churches which either at first hand or eventually became attached to Brougher. The result of the convention, owing to the eloquence and influence of the saint, afforded the liveliest satisfaction to both the bards of Ireland and the king of Dalriada, the newly formed kingdom in Scotland, and they would naturally desire to show their gratitude by an offering to some of the churches in the neighbourhood and they could not have chosen a more appropriate device than the "boat of gold" found at the neighbouring church of Brougher.

At Drumceat for many centuries after the convention it was the practice to hold a public procession of the Blessed Sacrament on the festival of All Saints, to commemorate the important events which took place there at the time of St. Columba's visit.

The boat in its symbolic aspect and in its ceremonial use is peculiarly interesting as an adjunct to churches of early date. That portion of the church known as the nave is so called as representing the ark or ship of the church, and is derived from the Latin word "navis." The vessel for holding incense made of precious metal was called originally navicula (French navette), and was afterwards known as the incense-boat. It was commonly borne by an acolyte, attending the thurifer. The practice of reserving the Blessed Sacrament, which is of very ancient date, led to the necessity of providing a suitable receptacle for it. It is alluded to by the early writers, and the Council of Constantinople under Mennas laid down rules on the subject, and reference is made to the gold and silver receptacles which were suspended over the altar ("Constitution of Menna," Act v. tom. v. p. 159).

When the monstrance came into use, the receptacle in which the Blessed Sacrament was deposited was still formed in the shape of a boat, somewhat like a lunette. A suggestion has been made that the bowl was used as a lamp; when bowls or mortars were used for lights they had a pricket in the bottom to hold the taper. The bowl is more likely to have been used as a sacred vessel, and the provision for suspending it rather shows this to be the case. It would be interesting to follow the evolution of these vessels, commencing with the round bottomed bowl, which could not stand alone; next we have the mazer pattern, later with a stem and foot; and in our earliest chalices we find simply a wide, broad bowl, with stem knob and foot. Of this class are the chalices found in the grave of Bishop Longespee at Salisbury, thirteenth century, and the chalice from the grave of Archbishop Hubert Walter of Canterbury, of late twelfth-century date, found in his tomb in 1890. The last stage is the tall chalice such as came into use in the sixteenth century. The "dove" or "columba" was suspended before the altar from the roof of the church.

It is more difficult to connect the collar with an ecclesiastical establishment, but there need be no difficulty in bringing its date well into the Christian period, as its ornament, the leading feature of which is the divergent spiral, survived in Ireland up to that time and much later than elsewhere.

In concluding this brief notice of the locality where the gold ornaments were found, I may state that I have been induced to pursue the investigations from Mr. Evans's conclusions in his valuable description of these objects in "Archæologia," before quoted, in which he considers that the treasure was of the nature of an ex-voto offering made by some Irish king or prince saved from shipwreck; and I offer the suggestion that the incidents connected with St. Columba's voyage to Drumceat, accompanied by the Scottish king, Aidan, and their deliverance from shipwreck, may have furnished the motif. Mr. Evans writes:—"The custom of making votive deposits was very widespread in the Early Iron Age and in the northern countries. Such hoards were often buried on the borders of lakes and pools, or actually beneath the waters. In the present case the deposit was made close to



the seashore, on a rocky part of the coast (?) liable to shipwrecks, and from the votive ship and its furniture there can be little doubt that it was a thankoffering dedicated by some ancient Irish sea-king, who had escaped from the perils of the waves, to a marine divinity." This suggestion is an admirable one as based on the evidence Mr. Evans had before him, but a study of the locality and its ancient history, with a knowledge of the principal events which took place in the vicinity, all tend to bring the date into the historical and Christian period.

### VENTILATION OF THE HOUSES OF PARLIAMENT.

THE select committee appointed in April last to inquire into the ventilation of the Houses of Parliament have presented an interim report, in which they state that they have held ten meetings, and have examined witnesses on the subject of the ventilation of the building and as to the best means of effecting such improvements as might be thought desirable. They have also caused chemical and bacteriological tests to be applied to the atmosphere in the debating chamber and other parts of the House. At the present stage of their inquiry the committee are not prepared with definite recommendations, nor can they yet state the conclusions to be arrived at with reference to the experiments made on the air, beyond saying that the general results so far as the debating chamber itself is concerned are good. It is added that the state of some of the committee-rooms, smoking-rooms, &c., is by no means satisfactory. The committee propose to continue their investigations during the autumn, though they do not expect to be able to report until next session. In the course of the evidence it was pointed out that the construction and fittings of certain of the lavatories were capable of improvement.

### ADELPHI ASSOCIATIONS.

WHATEVER the financial and architectural merits or demerits of the scheme for a new County Hall on the site of Adelphi Terrace may be, it would undeniably involve, says the *Standard*, the demolition of a most interesting corner of historic London. The name itself recalls the partnership of the four Adam brothers, who are also commemorated by the neighbouring streets. The sons of a distinguished Scotch architect, the designer of Hopetoun House and the Royal Infirmary at Edinburgh, they were members of that astute band of North Britons who acquired fortunes and much unpopularity at the beginning of the reign of George III., through the patronage of Lord Bute. Robert's was the master mind, and to him may be attributed the bold idea of raising shapely edifices, built on a continuous plan, upon the low-lying ground occupied by hovels and cowsheds, and known as Dorset Yard. Erected on arches, so as to give access to the Thames, the Adelphi stands upon supports of solid workmanship, which are well worth inspection. Undeclared by difficulties of site, the Adam brothers had also to contend against the vigorous hostility of the City. The protection of the Court brought upon them the attacks of the Corporation. They were compelled, accordingly, to have recourse to a special Act of Parliament, sanctioning their encroachments on the river, since that powerful body claimed rights over the soil and the bed of the Thames. Local interests had also to be conciliated, and the story goes that the great Mr. Coutts insisted that Robert Street should lie at such an angle as to preserve the view of the Surrey hills from the back windows of his counting-house. A survey of the ground reveals no distortion of plan, however, and it may be that the brothers merely pretended to humour the susceptibilities of their important neighbour. To yet another obstacle—a want of funds—they had to succumb, but not before their undertaking stood assured. The Adelphi was begun in 1768, and not many years afterwards—in 1773—they are found applying to Parliament once more for leave to dispose of the property by lottery—a common expedient in those days with speculative architects. Still, they had made their reputation, and on Robert Adam, in particular, prosperity smiled thenceforth without a break. Fine examples of his abilities are to be seen in many parts of London—for example, in Fitzroy Square, where he resorted to his favourite device of combining several houses into the semblance of an impressive whole. In his screen to the Admiralty, again, he succeeded with consummate skill in giving relief to the eye from Ripley's unworthy portico.

Horace Walpole sneered at Adelphi Terrace; it was to him a collection of "warehouses, laced down the seams like a soldier's frill on a regimental old coat." Its primness would, no doubt, affront the florid taste which found satisfaction in Strawberry Hill. The Adam brothers effected, nevertheless, a notable advance in domestic architecture, especially in their interiors. Many of the houses on the terrace—that occupied, for instance, by the Savage Club—bear witness to their sense of space and of apt decoration kept in strict subordination to

the general idea. To help them in the latter respect, they brought over Antonio Zucchi to England. It was a happy combination, since the Italian, without being an original genius, fully appreciated the possibilities of Classical treatment. The Adamsons, not content with building, were also designers of furniture. Their chairs and sideboards fetch high prices when they come into the market. The literary and artistic associations that would be destroyed by the disappearance of Adelphi Terrace are many and precious. Among its first tenants were Garrick, then at the height of his renown, and another associate of Dr. Johnson's, that great gentleman, Topham Beauclerk. The actor lived at what is now No. 5, and Boswell records how the doctor, returning one day from a dinner with his widow, stopped for a while by the rails of the Adelphi, looking on the Thames. The pair called to memory the loss of the two friends who had once dwelt in the buildings behind them. "Aye, sir," said Johnson tenderly, "and such friends as cannot be supplied." The Adelphi seems, in fact, to have been the home of more or less affluent Bohemianism during the greater part of its history. Rowlandson, the caricaturist, drew his last breath at his lodgings in No. 2 James Street. Lord Beaconsfield, as befitted the son of a literary father, believed himself to have been born in the Adelphi. He was wrong, since industrious research has bestowed that honour, with a clearer title, on a house in King's Road, or, as it now is, Theobald's Road. The mistake, however, was natural enough, for Isaac D'Israeli lived at No. 2 James Street as a bachelor, and stayed at Osborne's Hotel, in John Street, after his marriage with Miss Basevi. Later on the same house was much frequented by Charles Dickens. If their records were accessible, the hotels in this neighbourhood could produce, no doubt, a most varied list of literary visitors. But it is only from such casual allusions as occur in a letter from Gibbon to Lord Sheffield that the Adelphi Hotel is distinguished as having received the historian when he arrived from Lausanne with the manuscript of the last part of the "Decline and Fall." The humbler tap-rooms used, within present memories, to shelter a much more indigent class of hack-writers who starved in garrets off the Strand, and met at night to drown the bitterness of their adversity. Thus it was with the Adelphi, until with the growth of suburban London the whole character of the place underwent a change. It ceased to be residential, and became full of learned bodies and philanthropic causes, influenced, perhaps, by the example of the Society of Arts, which has inhabited John Street since 1774, after the Adam brothers had taken two years to build the house. In the theatre Dr. Goldsmith attempted to make a speech and failed, as might have been expected, whereas Dr. Johnson discoursed sonorously, and to the admiration of his audience, upon mechanics, of all subjects. But it would be inexpedient to attempt here a record of the Society of Arts, or, for that matter, of the less known corporations which have established themselves in the vicinity.

A house-to-house visitation reminds one how naturally institutions for the succour of the more indigent members of the dramatic profession have established themselves near the home of Garrick. In Adam Street are to be found the offices of the Actors' Benevolent Fund and of the Dramatic and Musical Sick and Benevolent Fund. Religion, largely evangelical, has also recognised the quiet corner by the Terrace as a suitable place for taking stock of its numerous efforts. In addition to the Evangelical Alliance, the Biblewomen and Nurses' Association and the Zenana Bible and Medical Mission have rooms there in close proximity to the Railway Mission. More secular interests begin to prevail as the Terrace is traversed westwards. The Institution of Naval Architects was founded in 1860, and thus its transactions follow the growth of the ironclad from the earlier types to such intricate monsters of the deep as will be seen at the great Naval Review on Saturday. Hard by, the Royal Literary Fund, started in 1790, does its best to remove the natural reproach of indifference to the calamities of authorship. The Royal Statistical Society is old enough to have celebrated its jubilee in 1885, though the kindred body at Manchester is a year its senior. It can boast a distinguished list of presidents, and its figures have materially helped legislation in attacking "condition of the people" problems. Lord Goschen's name is connected with its neighbour, the British Economic Association. The Incorporated Society of Medical Officers of Health dates from 1856—a date almost as significant as that of the foundation of the Statistical Society, because sanitary questions began to press themselves on Parliament with increasing vigour, until Mr. Disraeli summed them up with "Sanitas sanitatum, omnia sanitas."

In Robert Street philanthropy comes to the front again with the offices of the Soldiers' Daughters' Home, established during the Crimean war. In James Street is the Royal National Lifeboat Institution, of nearly eighty years' standing, and the Amateur Athletic Association, which has done so much to purge running and jumping of professional "pot-hunters." Thus the Adelphi will be seen, from a list which makes no



pretence of exhaustiveness, to contain a number of excellent bodies—some of quite long standing—which ought not to be made homeless by compulsory purchase except in the last necessity. Still the predominant tradition of this restful retreat from the roar of the Strand is that of letters and the arts—a tradition worthily carried on by the Savage Club. Great men have ceased to live out their private lives in its lofty apartments, but great memories remain, and they should not be lightly disturbed by the pickaxe of the house-wrecker.

### "KILLING" CEMENT.

A LETTER was published last week from Sir E. Durning-Lawrence, in which after recommending the use of Portland cement for dangerous structures like the Campanile, he said it should be "killed." The chairman of the Associated Portland Cement Manufacturers writes to the *Times* as follows:—

In saying that Portland cement should be "killed," he advocates what he would be the first to condemn. This term is used to express the action of over-watering cement in gauging it. The effect of mixing with the cement powder more water than it can assimilate for the purpose of crystallisation is to interrupt and even to counteract the setting process, and thus to prevent the attainment of eventual hardness.

Manufacturers look upon this as a danger to be guarded against in the testing of cement. Material of the finest quality may be made to appear worthless if the making of briquettes or pats is in the hands of an ignorant, inexperienced or careless tester. The precaution your correspondent rightly urges, and correctly describes, is called "aeration," and this is doubtless the word he intended to use.

### TESSERÆ.

#### Paintings and Sketches.

THE great purpose of art consists in the painter imparting to his copy the character of the original scene, and to the full attainment of that object extreme finish of details, so far from being essential, is in every respect most pernicious, inasmuch as such a practice diverts the mind of the observer from its natural inquiries to merely wonder at the patience of the artist. Beyond a certain point, the more the hand labours the more the thought of the mind is weakened, and the highest power the painter can attain, and which will ever be in proportion to his experience, is the knowledge when to leave off, and in this quality Velasquez is unrivalled. It has often been remarked that the first sketch of a picture gives more pleasure than the finished work. One reason, however, why a sketch often pleases more than the finished picture is that in the former much is left to the imagination of the spectators, and as each can fill up the seeming void according to his own fancy, all are likely to be more satisfied with this incompleteness than when the artist has fully carried out his own conception. Another reason is the sketch appeals to our feeling, which is more easily satisfied than our judgment, on which the picture depends for its appreciation. But there is a more powerful reason yet, which is, that in the first sketch the hand follows the mind, whereas in all subsequent work, more or less, it follows the eye; and this is shown in the fact that the highest finish is a source of pleasure to the sight, without producing any lasting impression on the mind. The first painting is a record of the will, whilst the mere finish is but the record of skill.

#### Lighting of Portraiture.

The reason why the human face appears to advantage only when light is thrown upon it more or less from above, and why its likeness can be correct only under such a light, is one very deeply rooted. The nature of man, his erect bearing, the direction of his look, everything that in his appearance distinguishes him from the animal bent to the earth, necessitates that conformation of the forehead, the nose, the mouth, &c., which is characteristic of the human face, and which was required by reason of the sunlight coming to him chiefly from above. And therefore, also, it is only the light coming more or less from above that shows the forms of his features in a characteristic way. Thus it is no exorbitant demand that sculpture ought to be seen in the same light in which the original appears to the best advantage, and which every painter is free to choose for himself and fix in his picture. In the plastic reproduction of the body the coarser and more general forms may be seen with tolerable distinctness even when a false light falls upon them, as the stereoscopic view aids the spectator. In the case of the more subtle features of the face, however, the stereoscopic impression plays but a subordinate part, on account of the slight difference of depth of the characteristic features. The true impression of the face in a bust therefore depends almost exclusively upon the play of light and shade which gives to the one-coloured material the

intended aspect. And this light and shade will be judiciously disposed only if the portrait is looked at as nearly as possible from the direction and in the light in which the artist intended it to be seen.

#### Roman Basilicas.

The basilica proper is an oblong building divided into three or more naves, the central being the most important, by colonnades, with a raised tribune, a sort of semicircular alcove called the absis or apse. This apse is separated from the nave by a wide transept running across the whole building, and generally extending beyond its limits of width, and spanning the central nave by a vast arch called "triumphal." The apse exactly corresponds to this great arch, and sometimes chapel have grown in the back wall of the transept, corresponding in like manner to the arches opening into the side naves, so as to end the vista of all the colonnades with these recesses and altars. In the earliest churches, however, altars were less abundant than now, and the central apse was the only one existing. Sometimes the side naves were double on each side (as in San Pietro), forming five with the central nave. Still the basilican oblong form remains in them all. The galleries, however, are not found in the earliest basilican churches. Coin remain which afford a rude representation of the great Ulpia basilica of Trajan, and from this one would gather that the galleries extended all along above the colonnades from end to end in that building. If so, the earlier churches built after these models omitted that feature, and raised the walls of the central nave on arches or colonnades with flat architraves under which access was given to the side naves. These naves, with the transept, apse and raised tribune, under which was subterranean chapel or "confession," in which the tombs of the saints were deposited, tombs which fixed the site of the church formed the leading structural features of the basilica proper.

### GENERAL.

**The King** and members of the Royal Family proposed to place in Whippingham Church a permanent memorial to Her late Majesty. This will probably take the form of an altar and rearedos.

**Taco Mesdag**, the landscape painter, and brother to Hendrik Willem Mesdag, died last week. He was born in 1829 at Groningen, and was the son of a banker. For many years he was engaged in his father's business, but during that time he already devoted himself to painting. In later life he confined himself to painting.

**The Excavations** at the Hill of Tara, in order to discover the Ark of the Covenant, have been suspended, and it is very doubtful whether they will be resumed.

**Mr. Ryde**, of Westminster, has been appointed by the Horsham Board of Guardians as valuer to survey and value for poor rate assessment purposes the several buildings and other hereditaments comprising Christ's Hospital school and premises in the parishes of Horsham Rural and Itchingfield.

**Mr. A. Y. Nutt**, the designer of the temporary annex to Westminster Abbey, was decorated on Monday with the insignia of a member of the Royal Victorian Order. Mr. Nutt is the clerk of works at Windsor Castle, being in the capacity the representative of Mr. Akers-Douglas, and he is also the architect to the Dean and Chapter of St. George's Chapel.

**The Prix de Rome** in architecture has been awarded to M. Prost. The subject was a national printing-office. The premier second grand prix was obtained by M. Chiffot, and the third by M. Coutan.

**The Athens Correspondent** of the *Times* writes:—Excavations carried out by the Greek Archaeological Society in the neighbourhood of Andritzæna have resulted in the discovery of a small temple of Pan, the columns of which are stated to be in good preservation.

**The Emperor Menelik II.** has sent a letter to the trustees of the British Museum acknowledging the receipt of the address and publications transmitted to His Majesty, and giving assurance of help and protection to all English people who may go to Abyssinia in the interest of science.

**M. Charles Girault**, the French architect, having completed his plans, is to undertake the enlargement of the palace of Laeken, originally designed by Montoyer and Payen, for the King of the Belgians.

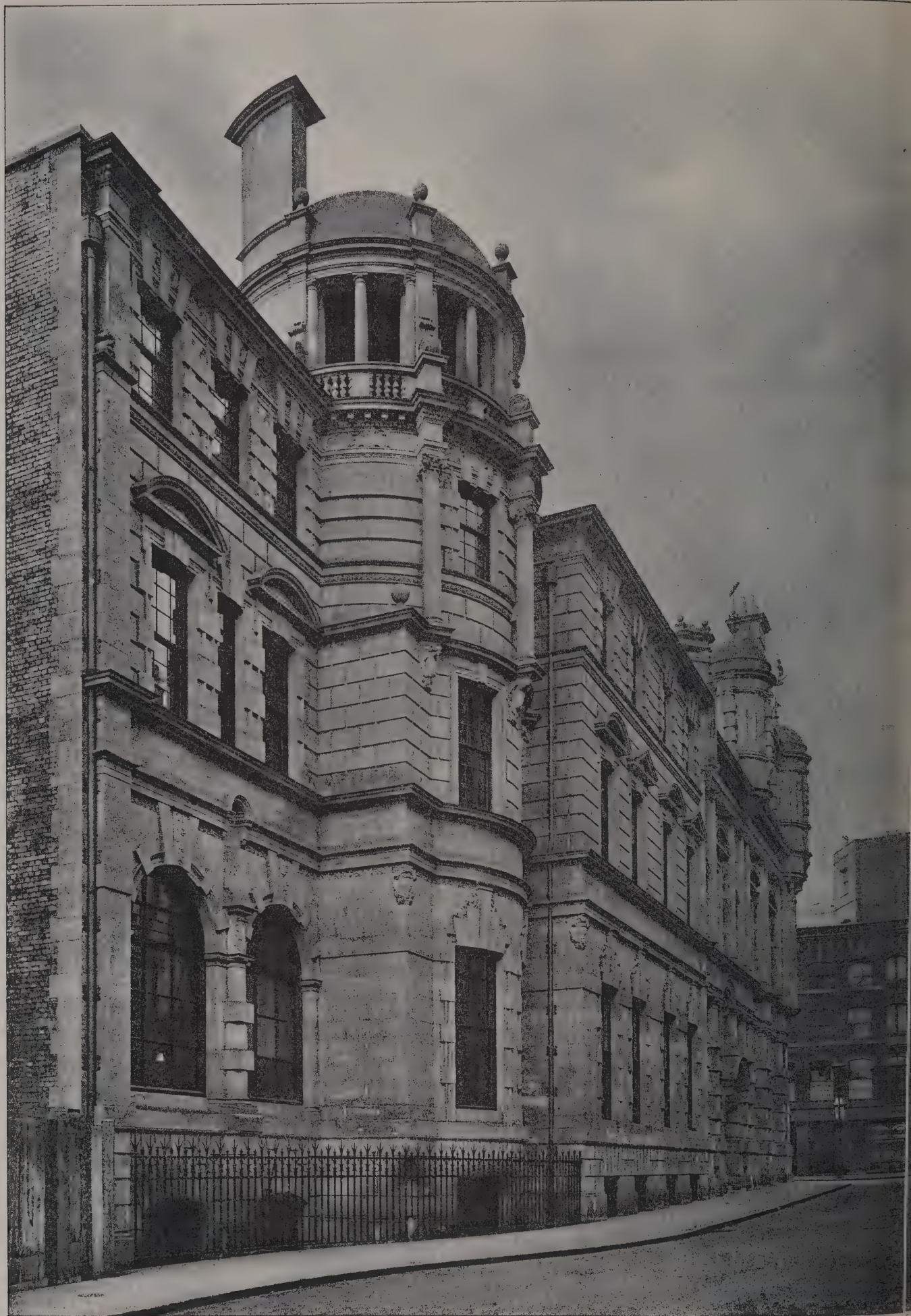
**The Board of Management** of the Manchester Royal Infirmary have agreed to ask the trustees for power to sell the infirmary buildings and site to the Manchester Corporation for 400,000*l.*

**A Special Commission** has been appointed in Paris in order to investigate the best means of dealing with the smoke nuisance which of late years is troubling the Parisians. A commission relating to the subject will be examined and tested on application to the Prefect of the Seine.









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FULL LENGTH SIDE VIEW: LLOYD'S BUILDING, FENCHURCH STREET, E.C.

T. E. COLLCUTT, F.R.I.B.A., Architect.















*The Architect*, Aug 15<sup>th</sup> 1902.



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CATHEDRAL SERIES, No. 403.—HEREFORD: NORTH PORCH.







The Architect, Aug 15<sup>th</sup> 1902.







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**PREMISES: 74 CHEAPSIDE, E.C.**

WALTER GRAVES, F.R.I.B.A., Architect.







The Architect, Aug 15<sup>th</sup> 1902.



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CATHEDRAL SERIES, No. 404.—HEREFORD: SOUTH TRANSEPT AND CLOISTERS.









PHOTO-LITHO. SPRAGUE & CO. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

PROPOSED HOUSE ON THE MEDWAY.

SIDNEY V. NORTH, A.R.I.B.A., Architect.









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HALF LENGTH SIDE VIEW: LLOYD'S BUILDING, FENCHURCH STREET, E.C.

T. E. COLLCUTT, F.R.I.B.A., Architect.







THE

## Architect and Contract Reporter.

## EDITORIAL NOTICES.

*In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

## TENDERS, ETC.

*\* As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

## COMPETITIONS OPEN.

**BERMONDSEY.**—Sept. 16.—Designs are invited for artisans' dwellings to be erected on land at Rotherhithe, within the borough of Bermondsey, and known as the Fulford Street area. Premiums of 100*l.*, 60*l.* and 40*l.* will be awarded. Mr. Fredk. Yall, town clerk, Town Hall, Spa Road, S.E.

**BIDEFORD.**—Sept. 25.—The Town Council of Bideford are about to erect municipal offices and a public library upon a site opposite the west end of the Long Bridge, Bideford, and they invite designs for the proposed buildings. Premiums of 100*l.*, 15*l.* and 10*l.* respectively are offered for the designs which shall be placed by the Council first, second and third in order of merit. Designs and descriptions, &c., are to be delivered to Mr. Wm. B. Seldon, town clerk, 18 The Quay, Bideford.

**DEPTFORD.**—Aug. 30.—Competitive designs are invited for a town hall and municipal offices. Premiums of 100*l.*, 75*l.* and 50*l.* are offered for the three selected designs. Mr. Vivian Chard, town clerk, Municipal Offices, 20 Tanner's Hill, Deptford S.E.

**INDIA.**—Nov. 1.—Competitive designs are invited for the erection of a memorial to Her Majesty the late Queen Victoria at Allahabad. A premium of 2,000 rupees will be awarded to the design selected by the committee. Mr. H. Nelson Wright, Indian Civil Service, honorary secretary, Queen Victoria Memorial Fund Committee, Allahabad, India.

**LIVERPOOL.**—Sept. 15.—Designs are invited for new labourers' dwellings to accommodate about 2,500 persons, to be erected on the Hornby Street area. Premiums of 250*l.*, 150*l.* and 100*l.* respectively are offered for the first three selected designs. Particulars will be supplied by the Town Clerk.

**MAIDENHEAD.**—Oct. 1.—Designs for free library. Premiums offered of 50*l.*, 20*l.* and 10*l.* respectively. Mr. John Kirk, town clerk, Guildhall, Maidenhead.

**SOUTHEND.**—Sept. 7.—Designs are invited for a church to accommodate 500 persons, a clergy-house, and a parochial hall or parish-room about 50 feet by 30 feet. Mr. C. H. J. Talmage, Kathleen Villa, Southchurch Road, Southend-on-Sea.

**SUNDERLAND.**—Aug. 30.—Designs are invited for proposed police and fire-brigade buildings to be erected in Gill Bridge Avenue and Dun Cow Street. Premiums of 100*l.*, 50*l.* and 25*l.* are offered for first, second and third designs respectively. Mr. Fras. M. Bowey, town clerk, Town Hall, Sunderland.

## CONTRACTS OPEN.

**BEXHILL.**—Aug. 20.—For erection of a shelter hall, lavatories, and conveniences in Egerton Park Road, Bexhill, Sussex. Mr. E. Sholto Douglas, clerk, Town Hall, Bexhill.

**BIRKENHEAD.**—Aug. 26.—For erection of offices at the tramways depot, Laird Street. Mr. Chas. Brownridge, borough surveyor, Town Hall, Birkenhead.

**BLACKPOOL.**—For erection of two houses in Palatine Road. Mr. R. Holdens, 211 Palatine Road, Blackpool.

**BOSFRANKAN.**—Aug. 19.—For erection of a stable and wainhouse, &c., at Bosfrankan, Cornwall. Mr. George Gow, Tregothnan Office, Truro.

**BRANDESTON.**—For repairs to Brandeston Vicarage, Suffolk. Mr. Henry C. D. Roberts, Brandeston Vicarage, Wickham Market.

**BRISTOL.**—Aug. 21.—For construction of foundations, culverts, subways, &c., at the Avonbank electricity works. Mr. H. Faraday Proctor, city electrical engineer, Temple Back, Bristol.

**BRISTOL.**—Aug. 25.—For erection of school premises at Mina Road, Bristol. Mr. H. Dare Bryan, architect, 38 College Green, Bristol.

**BURNHAM-ON-CROUCH.**—Aug. 25.—For erection of an engine-house at the waterworks, Burnham-on-Crouch. Mr. E. Dillway, High Street, Burnham-on-Crouch.

**CARLISLE.**—For pulling-down and clearing the site and erection of hotel and assembly rooms, Carlisle. Messrs. Oliver & Dodgshun, architects, Carlisle.

**CLAY CROSS.**—For erection of six dwelling-houses, Holmgate. Mr. Ernest Oxley, architect, Clay Cross.

**COLCHESTER.**—Aug. 23.—For altering pumps at the waterworks, Balkeine Hill. Mr. C. E. Bland, waterworks superintendent, Town Hall.

**DARTFORD.**—Aug. 20.—For about 100 cubic yards of excavation and concreting, and a small quantity of brickwork for pipe trenches at the electricity works. Mr. J. C. Hayward, clerk, U. D. C. Sessions House, Dartford.

**DEVONPORT.**—Aug. 18.—For erection of boundary walls, &c., at the new cemetery, North Prospect. Mr. John F. Burns, borough surveyor, Municipal Offices, Ker Street, Devonport.

FREE TO ARCHITECTS.

A PRACTICAL TREATISE ON

WARMING AND VENTILATING

APPLICATION TO THE

STURTEVANT ENGINEERING CO. LD.

47 QUEEN VICTORIA STREET, LONDON.



ENFIELD.—Sept. 6.—For erection of a deaf centre and additions to the junior mixed and infant departments at the Bush Hill Park school, Enfield, Middlesex. Mr. G. E. T. Laurence, architect, 22 Buckingham Street, Adelphi, W.C.

GAINSBOROUGH.—For erection of new stable buildings at Gate Burton, near Gainsborough. Mr. E. F. Green, architect, Gainsborough.

GLASGOW.—Aug. 20.—For supply of two Lancashire boilers with accessories, laundry machinery and hot and cold water service, heating apparatus, &c., at the Eastern District Hospital, Duke Street. Mr. Jas. R. Motion, Parish Council Chambers, 38 Cochrane Street, Glasgow.

GLOUCESTER.—Aug. 28.—For erection of a nurses' home at the Gloucester infirmary. Messrs. Waller & Son, architects, 17 College Green, Gloucester.

GRAVESEND.—Aug. 19.—For erection of a water-tower and the supply of a pump and fire appliances at the sanitary hospital, Denton, near Gravesend. The City Surveyor, Guildhall, E.C.

GRAYS.—Aug. 27.—For raising the top-floor ceilings and cleaning and painting and other works at the *Exmouth* training ship infirmary, Therfield House, Grays, Essex. Mr. T. Duncombe Mann, clerk, Metropolitan Asylums Board, Embankment, E.C.

GRIMSBY.—Aug. 26.—For piling, timbering and concreting at the Alderman Dobson school. Mr. H. C. Scaping, architect, Court Chambers, Grimsby.

GWITHIAN.—Sept. 6.—For rebuilding the Pendarves Arms hotel, Gwithian, Cornwall. Mr. Horace W. Collins, architect, Walredden, Redruth.

HACKNEY.—Sept. 11.—For erection of coal stores. Mr. George Grocott, town clerk, Town Hall, Hackney.

HALIFAX.—Aug. 19.—For altering shop at the south-west corner of the market. Mr. James Lord, borough engineer, Town Hall, Halifax.

HAMPSTEAD.—Aug. 27.—For erecting a bathroom at the North-Western Fever Hospital, Lawn Road. Metropolitan Asylums Board, Embankment, E.C.

HARPENDEN.—For erection of a house in Station Road, Harpenden, Herts. Mr. J. J. Buck, Station Road, Harpenden.

HARROGATE.—Aug. 25.—For the excavation and refilling of about 725 lineal yards of trench for an intended line of 7 in.

cast-iron pipes, commencing on the south side of the High Bridge, Knaresborough, thence along Waterside, and terminating at a point near the pumping station of the Knaresborough Urban District Council. Mr. Edwd. Wilson Dixon, engineer, 14 Albert Street, Harrogate.

HONITON.—Aug. 27.—For the construction of an open concrete storage reservoir, having a capacity of 1,500,000 gallons, filter-beds and covered service reservoir, together with the supply, laying and jointing of about 2,100 yards of 4 in. and 3 in. cast-iron socket pipes, with sluice and air valves, hydrants, &c. Messrs. Beesley, Son & Nichols, engineers, 11 Victoria Street, Westminster, S.W.

HULL.—Aug. 19.—For erection of a junior department and deaf centre in connection with the Osborne Street Board school, Kingston-upon-Hull. Messrs. Brodrick, Lowther & Walker, architects, Lowgate, Hull.

ILKESTON AND HEANOR.—Aug. 21.—For construction of a covered service reservoir, holding 800,000 gallons, at Ilkeston, a covered service reservoir, holding 440,000 gallons, at Codnor, and for the provision and laying of a gravitation main from Chadwick Nick reservoir through Heanor to Ilkeston. Mr. Wright Lissett, town clerk, Ilkeston.

ILFRACOMBE.—Aug. 20.—For the construction of masonry intakes in the parish of Challacombe, laying cast-iron pipes, &c., in connection with the new gravitation main from Challacombe to Ilfracombe. Mr. O. M. Prouse, engineer, Town Hall, Ilfracombe.

IPSWICH.—Aug. 27.—For erection of generating station, offices, car-shed, chimney-shaft and destructor buildings in Constantine Road, Ipswich. Mr. Will Bantoft, town clerk, Town Hall, Ipswich.

IRELAND.—Aug. 20.—For erection of semi-detached villa residence at Rostrevor, co. Down. Mr. W. James Watson, architect, Rostrevor.

IRELAND.—Aug. 23.—For erecting an iron shed on the workhouse premises, New Ross. Mr. P. A. Pope, clerk to the Guardians, New Ross.

KENDAL.—For additions to the boys' classroom and cloakroom at the Kendal National schools. Mr. John Stalker, architect, 57 Highgate, Kendal.

KING'S LYNN.—Aug. 26.—For erection of a screw pile light beacon on the west bank of the Vinegar Middle Cut, King's Lynn Channel. Mr. W. D. Ward, clerk, King's Lynn.

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LEEDS.—Aug. 19.—For erection of small shed and carpenter's and smith's shops, &c., at Antwerp Mills, Armley. Mr. C. S. Nelson, architect, 15 Park Row, Leeds.

LEEDS.—Sept. 8.—For preparing the foundation of the Killingbeck hospital for smallpox, including formation of a new road. Mr. Edwin T. Hall, architect, 54 Bedford Square, W.C.

LEES.—Aug. 19.—For erection of house and outbuildings in Nelson Street, Lees, Yorks. Mr. Thos. W. Bottomley, architect, 16 Prince Street, Haworth.

LONG EATON.—For erection of an engine-house and rope race. Mr. John Sheldon, architect, Darley House, Long Eaton.

MALVERN.—Aug. 23.—For supply of two Lancashire boilers (with feed-water heater and pipework), engines, alternators, exciters and switchboard, high and low-tension concentric cables and transformers. Mr. H. P. Maybury, surveyor, Council House, Malvern.

MANCHESTER.—Aug. 20.—For pointing walls at the workhouse at Crumpsall. Mr. A. J. Murgatroyd, architect, 23 Strutt Street, Manchester.

MANCHESTER.—Aug. 29.—For painting walls at schools at Swinton, near Manchester. Mr. A. J. Murgatroyd, architect, 23 Strutt Street, Manchester.

MANCHESTER.—Aug. 20.—For doors to enclose the shelves in the ward storerooms at the workhouse at Crumpsall. Mr. A. J. Murgatroyd, architect, 23 Strutt Street, Manchester.

MANCHESTER.—Aug. 20.—For construction of a retaining wall at Whitworth Street open space, City. Mr. Wm. Henry Talbot, town clerk, Town Hall, Manchester.

MANNINGHAM.—Aug. 18.—For altering and extending soapworks at Sedgwick Street, Manningham. Mr. J. W. C. Atkinson, architect, 1 Ivegate, Bradford.

MARKET WEIGHTON.—Aug. 20.—For erection of a police-station and court-house at Market Weighton, Yorks. Mr. Alfred Beaumont, county surveyor, County Hall, Beverley.

MEXBOROUGH.—For additions, &c., to the Working Men's Club and Institute. Mr. Wilfred Gothwaite, architect, 78 High Street, Mexborough.

MEXBOROUGH.—Aug. 20.—For erection of an infants' and mixed school. Mr. H. L. Tacon, architect, 11 Westgate, Rotherham.

MORLEY.—For erection of stabling, &c., Maxwell Street, Morley, Yorks. Messrs. R. Castle & Son, architects, London, City and Midland Bank Chambers, Cleckheaton.

NEWCASTLE-ON-TYNE.—Aug. 30.—For erection of fifteen workmen's cottages at High Coxlodge. Particulars and plans to be seen at Coxlodge Colliery Office, Gosforth.

NEWCASTLE-ON-TYNE.—Aug. 30.—For erection of offices, &c., in Pilgrim Street, Newcastle-on-Tyne. Mr. Henry Holliday, Consett Iron Co., Consett.

PARKESTON.—Sept. 3.—For erection of schools for 510 children and alterations at Parkeston, Essex. Messrs. Start & Rowell, architects, Colchester.

PLYMOUTH.—Aug. 23.—For overhead line construction in connection with the tramways. Mr. E. G. Okell, borough electrical engineer, Prince Rock, Plymouth.

RAYLEIGH.—For erection of a pair of semi-detached houses in the Crown Lane, Rayleigh, Essex. Messrs. Burles & Harris, architects, Clarence Chambers, Southend-on-Sea.

RUGBY.—Aug. 20.—For supply and erection of one 150-kw. and one 60-kw. high-speed steam alternators (three-phase), switchboard, underground mains, arc lamps, public incandescent lamps, meters, &c. Mr. T. M. Wratishaw, clerk, Urban District Council, Rugby.

ST. ANNES-ON-SEA.—Aug. 18.—For erection of public abattoirs at St. Annes-on-Sea, Lancs. Mr. J. Whitaker, architect, Clifton Chambers, Orchard Road, St. Annes-on-Sea.

SCOTLAND.—Aug. 18.—For erection of destructor furnaces, &c., at the Crawford Street despatch works, Glasgow. Mr. D. McColl, superintendent of cleansing, City Chambers, Glasgow.

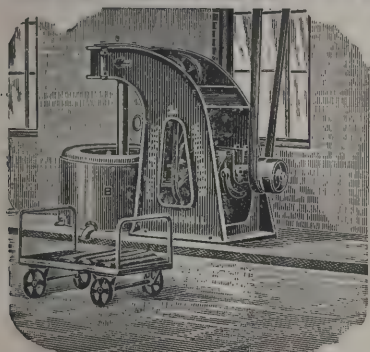
SCOTLAND.—Aug. 21.—For erection of a nurses' home and pathological laboratory and mortuary at Woodilee asylum, Lenzie, Glasgow. Messrs. James Salmon & Son, architects, 53 Bothwell Street, Glasgow.

SCOTLAND.—Aug. 22.—For alterations and repairs on barn and stable at the farm of Blair of Fintray. Mr. Stewart, architect, Blair.

SCOTLAND.—Aug. 22.—For erection of large elementary school at the west end of Linlithgow. Mr. W. I. Scott, architect, Linlithgow.

SCOTLAND.—Aug. 26.—For erection of an infants' school at Grangemouth. Mr. James Strang, architect, Vicar Street, Falkirk.

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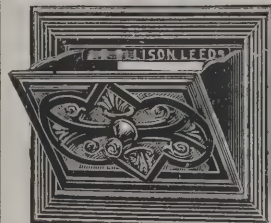
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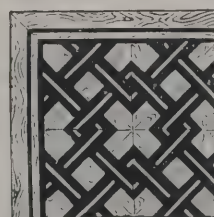
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**STALYBRIDGE.**—For construction of concrete foundations, &c., at the Stalybridge generating station. Mr. Huon A. Matear, architect, The Temple, Dale Street, Liverpool.

**SWINDON.**—Aug. 22.—For erection of higher elementary school, Euclid Street, Swindon. Mr. W. Seaton, town clerk, Town Hall, Swindon.

**SWINDON.**—Aug. 25.—For extensions to the technical school, Victoria Road. Messrs. Bishop & Pritchett, architects, Regent Circus, Swindon.

**THORNTON.**—Aug. 25.—For erection of a police station and cells, &c., at Thornton, Lancs. Mr. Henry Littler, architect, County Offices, Preston.

**WALES.**—For renovating the Rhymney parish church. Particulars may be obtained on application at the General Offices, Rhymney.

**WALES.**—Aug. 18.—For erection of a large hotel, with stables, &c., Jubilee Road, Aberaman. Messrs. Llewellyn Smith & Davies, architects, &c., Aberdare.

**WALES.**—Aug. 18.—For erection of a stone arched bridge, or, in the alternative, of an iron girder bridge, at the Pitt, Llanarth; and for erection of a stone retaining wall to the bridge at Hendre Glyn, Llanover, Abergavenny. Mr. John Gill, surveyor, 4 Brecon Road, Abergavenny.

**WALES.**—Aug. 18.—For construction of basements and foundations and other works for the proposed new lunatic asylum at Whitchurch, near Cardiff. Messrs. Oatley & Skinner, architects, Edinburgh Chambers, Baldwin Street, Bristol.

**WALES.**—Aug. 19.—For erection of a presbytery, Mountain Ash. Mr. T. R. Bates, architect, 26 Westgate Chambers, Newport.

**WALES.**—Aug. 20.—For alterations and additions to Minera police-station, Denbigh. Mr. R. Lloyd Williams, county surveyor, Denbigh.

**WALES.**—Aug. 22.—For erection of an electric-power station and car-sheds, Pontypridd. The Chairman of the Electric Lighting and Tramways Committee, Council Offices, Town Hall, Pontypridd.

**WALES.**—Aug. 25.—For erection of a cottage hospital, &c., at Rhymney, Mon. Messrs. Llewellyn, Smith & Davies, architects, Aberdare.

**WALES.**—Aug. 27.—For erection of a lunatic asylum at Caerleon, Mon. Mr. A. J. Wood, architect, 22 Surrey Street, Victoria Embankment, W.C.

**WALES.**—Sept. 8.—For erection of a cattle and sheep market at Llandovery. Mr. John Thomas, town clerk, Llandovery.

**WALSALL.**—Sept. 8.—For erection of a school to accommodate 1,000 children and a caretaker's house at North Walsall. Mr. H. E. Lavender, architect, Bridge Street, Walsall.

**WESHAM.**—Sept. 30.—For erection of workhouse and offices at Wesham, Lancs. Messrs. Haywood & Harrison, architects, Accrington.

**WITHINGTON.**—For erection of a nurses' home, two pavilions and surgical wards at the infirmary at Withington, Lancs. Mr. James B. Broadbent, architect, 15 Cooper Street, Manchester.

**WOOD GREEN.**—Aug. 19.—For erection of four, eight, fourteen or twenty-two private dwelling-houses on the Westbury estate. Plans and specifications can be seen at 9 Waldegrave Road, Turnpike Lane, Hornsey.

AT a meeting of the Louth Corporation, the electric lighting committee recommended the erection of an electric light and power works, at a cost of 10,000*l.*, on land in the centre of the town belonging to the Corporation.

AT the half-yearly meeting of the Central Board of the National Association of Master Plumbers of Great Britain and Ireland at Huddersfield on the 13th inst., presided over by Mr. W. L. Harrison, of Hull, a report was read of the work of the educational committee in reference to a form of indenture for apprentices, which had been drawn up in conjunction with the Worshipful Company of Plumbers of London. Hitherto there has been great laxity in the trade throughout the country respecting apprentices, and it became necessary in many cases for operative plumbers to be recruited from the country. The form of indenture, providing for a seven years' apprenticeship, unless the lad has been previously pursuing his education to fit him for his trade at a technical school, on terms varying according to localities, was adopted. Luncheon was partaken of at the Liberal Club, and was attended by the mayor (Alderman Ernest Woodhead). At a subsequent stage it was resolved not to recognise the new by-law of the Operative Plumbers' Association providing for extra allowances for out-of-town work. A resolution passed at Leeds on July 10 by representatives of the Confederation of Master Slaters, Painters, Plumbers and Plasterers, not to join the National Builders' Federation, was adopted.

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G. Kemp . . . . . 570 0 0  
W. Norris . . . . . 491 0 0
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J. Hughes . . . . . £3,560 0 0  
M. Bateman . . . . . 3,525 0 0  
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W. GARLAND, Aldershot (*accepted*) . . . 3,089 0 0

## BIRKENSHAW.

- For erection of Wesleyan Sunday schools at Westgate Hill, Birkenshaw, Yorks. Messrs. WALKER & COLLINSON, architects, Swan Arcade, Bradford.

*Accepted tenders.*

- J. Brown & Sons, Bingley, mason.  
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J. Booth & Son, Bradford, plumber.  
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## CANNOCK.

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## DEWSBURY.

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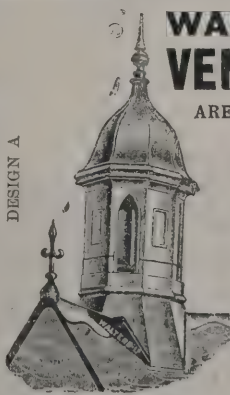
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**DARTFORD.**

For construction of about 700-feet run of 9-inch stoneware surface-water drain, together with 6-inch branches, man-holes, &c., Fulwich Lane. Mr. W. HARSTON, surveyor.

J. Coker	£356	0	0
Wilson, Border & Co.	215	0	0
G. Bell	196	0	0
G. G. Page	195	15	0
GIBBS & CO., Ilford (accepted)	180	0	0

**EASTBOURNE.**

For erection of proposed park-keeper's lodge and refreshment buildings at Hampden Park. Mr. W. CHAPMAN FIELD, borough architect

*Refreshment building.*

W. Backhurst	£1,060	0	0
A. J. White	1,125	0	0
R. H. Stanbridge	1,100	0	0
M. Hookham	958	0	0
W. & E. NOAKES, Eastbourne (accepted)	816	10	0

*Park-keeper's lodge.*

W. Buckhurst	820	0	0
W. & E. Noakes	559	0	0
A. J. White	520	0	0
M. Hookham	496	8	0
R. H. STANBRIDGE, Eastbourne (accepted)	475	0	0

**GRIMSBY.**

For facing gables and building walls in connection with the Pasture Street continuation, Convamore Road. Mr. H. GILBERT WHYATT, surveyor.

W. H. SMITH, Welhome Avenue (accepted) . £91 4 10

For reconstruction of drainage, 19 to 39 Victor Street, Grimsby.

T. R. WATERMAN, Wellington Street (accepted) . £50 5 2

**HASTINGS.**

For painting (inside and out) the various greenhouses and pit lights, &c., in the Alexandra Park, Gensing Gardens and St. Leonards Gardens, for the Corporation. Mr. P. H. PALMER, borough engineer.

*Accepted tenders.*

Woodcock & Co., 2 Myrtle Villas, Canute Road, Clive Valley, Alexandra Park (two)	£67	0	0
Collins, South Road, St. Leonards, Gensing and St. Leonards Gardens	58	0	0

**HAMPSTEAD.**

For erection of boundary wall, &c., at the new stoneyard and dépôt, Lymington Road, Finchley Road, N.W. Mr. O. E. WINTER, borough engineer.

Spiers & Son	£4,470	0	0
J. Gibb	3,440	0	0
H. B. Oldrey & Son	3,350	0	0
W. H. Drake	3,000	0	0
H. Kent	3,000	0	0
E. Rogers & Co.	2,700	0	0
C. W. KILLINGBACK & Co., James Street, Camden Town, N.W. (accepted)	2,695	0	0

**HUDDERSFIELD.**

For erection of a dwelling-house and stable in Barton Road, Crosland Moor. Mr. J. BERRY, architect, 3 Market Place, Huddersfield.

*Accepted tenders.*

W. Gledhill, Lockwood, mason.  
J. Sunderland & Sons, Lockwood, joiner.  
Sanderson Bros., Lockwood, plumber.  
G. H. Day, Milnsbridge, plasterer.  
T. Cartwright, Crosland Moor, painter.  
A. Bower, Crosland Moor, slater.  
J. Cooke, Littleroyd, concreter.

**IPSWICH.**

For erection of a chimney-shaft and reconstruction, with additions, of the present boiler-house, &c., at the borough asylum. Mr. E. BUCKHAM, borough surveyor

London Boiler Setting Co.	£2,477	11	0
C. Roper	1,752	0	0
Wykes & Warner	1,707	0	0
C. Barrett	1,695	0	0
S. A. Kenney	1,518	0	0
D. Lee	1,509	0	0
H. J. Linzell	1,495	0	0
G. Grimwood & Sons	1,438	0	0
A. J. Watson	1,340	0	0
S. SKERRITT, Lacy Street, Ipswich (accepted)	1,350	0	0

**IRELAND.**

For carrying-out sanitary improvements in the workhouse infirmary.

T. W. LITTLE, Dublin (accepted) . £282 15 5

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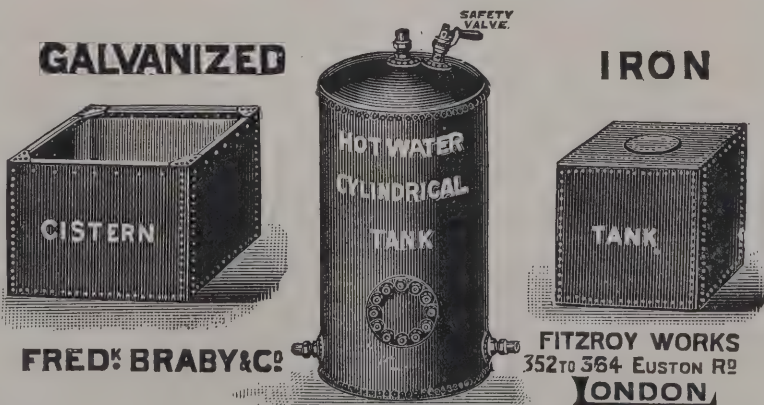
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IRELAND—continued.

For additions to engine-house at the asylum, Armagh, for the committee. Mr. R. H. DORMAN, county surveyor, Armagh.  
Martin & Co, Armagh . . . . . £226 0 0  
For painting all the external wood and ironwork of the workhouse hospitals, Glenties.  
J. O'DONNELL & SON, Glenties, co. Donegal (accepted) . . . . . £14 10 0  
For erection of two urinals in Larne.  
D DOWDS, Main Street (accepted) . . . . . £46 5 0  
For painting the internal and external wood and ironwork of the workhouse, Tobercurry.  
J. GORDON, Ballaghaderreen, co. Mayo (accepted) £55 0 0

KENSINGTON.

For alterations and additions to superintendent's house at Warwick Road depôt.  
G F. Kent . . . . . £248 0 0  
Spencer, Santo & Co. . . . . 246 10 0  
B COLLEY & SONS (accepted) . . . . . 239 0 0  
For alterations and additions to the receiving wards of the workhouse in the Marloes Road.  
W. Webber . . . . . £1,315 0 0  
F. G. Minter . . . . . 1,260 0 0  
J. Jarvis & Sons . . . . . 1,245 0 0  
L. F. Lamplough . . . . . 1,219 0 0  
F. W. Harris . . . . . 1,169 0 0  
L. Whitehead & Co., Ltd. . . . . 1,150 0 0  
J. O. RICHARDSON, Peckham (accepted) . . . . . 1,075 0 0  
For construction of underground conveniences in Westbourne Grove.  
Doulton & Co., Ltd. . . . . £2,146 0 0  
G. Jennings, Ltd. . . . . 2,080 0 0  
Davis & Bennett . . . . . 2,049 0 0  
B. FINCH & CO, LTD. (accepted) . . . . . 1,958 0 0

LEWISHAM.

For street works in Overcliff Road (Part I).  
W. PEARCE, David's Road, Forest Hill (accepted) . . . . . £250 0 0

LICHFIELD.

For supplying and laying 3 feet 6 inches deep 310 yards of 4-inch turned and bored cast-iron pipes (coated) in St. John Street. Mr. W. L. CATLIN, engineer.  
J Wood . . . . . £124 0 0  
W. Goodman . . . . . 110 0 0  
A. PITSBURY, Lichfield (accepted) . . . . . 92 10 0

LITTLE SUTTON.

For construction of Walker's Lane, Little Sutton, Cheshire, for the Wirral Rural District Council.  
R. HUGHES, Brimstange (accepted) . . . . . £445 0 0

LOCKWOOD.

For erection of machine-cut gearing works, offices, men's dining and reading rooms on the Park Cottage estate, Lockwood, Huddersfield Mr. J. BERRY, architect, 3 Market Place, Huddersfield.

Accepted tenders.

W. Mallinson & Son, Lockwood, mason.  
H. Holland, Huddersfield, joiner  
D. Taylor & Sons, Lockwood, plumber.  
G. H. Day, Milnsbridge, plasterer.  
J. Preston, Huddersfield, painter.  
T. Allison, Ltd., Milnsbridge, slater.  
J. Cook, Littleroyd, concreter and wood block.  
W. H. Heywood & Co., Huddersfield, patent glazing.  
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W. R. & A. Hide . . . . . 108 0 0  
W. Hornett . . . . . 102 0 0  
F. Chidley . . . . . 99 16 0  
W. Brown & Sons . . . . . 99 0 0  
Bristow & Eatwell . . . . . 95 0 0  
F. T. CHINCHEN & CO. (accepted) . . . . . 94 10 0

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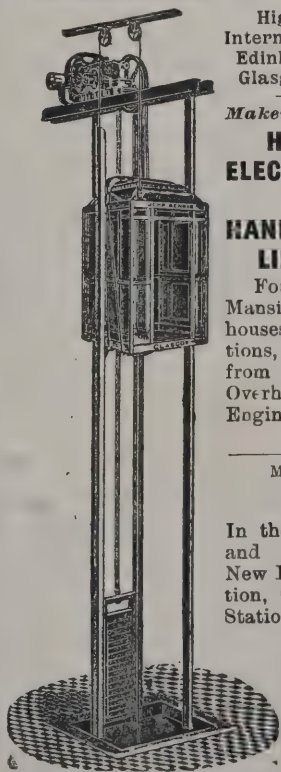
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G. H. Sealy . . . . .	£343	0	0
J. & M. Patrick . . . . .	276	0	0
General Builders, Ltd. . . . .	249	0	0
F. Chidley . . . . .	161	0	0
S. Polden . . . . .	154	0	0
W. Brown & Sons . . . . .	130	0	0
F. T. Chinchin & Co. . . . .	119	15	0
Bristow & Eatwell . . . . .	117	0	0
W. R. & A. HIDE (accepted) . . . . .	102	15	0

## Lillie Road.

J. & M. Patrick . . . . .	£260	0	0
E. Flood . . . . .	184	0	0
C. Girling . . . . .	168	0	0
F. Chidley . . . . .	147	18	0
W. Brown & Sons . . . . .	138	10	0
W. Chappell . . . . .	126	10	0
W. HAMMOND (accepted) . . . . .	115	10	0

## Munster Road.

J. & M. Patrick . . . . .	£248	0	0
Lathey Bros. . . . .	169	10	0
C. Girling . . . . .	163	0	0
W. Hornett . . . . .	159	10	0
W. Brown & Sons . . . . .	153	0	0
E. B. Tucker . . . . .	136	17	0
W. Chappell . . . . .	128	10	0
W. HAMMOND (accepted) . . . . .	122	5	6

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Silk & Son . . . . .	£750	0	0
Marchant & Hirst . . . . .	595	0	0
W. Hornett . . . . .	570	0	0
G. Kirby . . . . .	508	0	0
F. W. Harris . . . . .	492	0	0
Stevens Bros. . . . .	487	0	0
C. DEARING & SON (accepted) . . . . .	458	0	0

## Montem Street.

C. Dearing & Son . . . . .	£269	0	0
McCormick & Son . . . . .	213	0	0
C. & W. Hunnings . . . . .	150	0	0
Bate Bros. . . . .	147	0	0
G. Kirby . . . . .	146	0	0
STEVENS BROS. (accepted) . . . . .	134	0	0

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## Childeric Road.

J. & M. Patrick . . . . .	£275	0	0
W. Hooper . . . . .	207	0	0
A. Black & Son . . . . .	194	0	0
Sayer & Son . . . . .	159	0	0
W. J. Howie . . . . .	152	0	0
H. Groves . . . . .	148	10	0
W. Banks . . . . .	144	17	6
G. Kemp . . . . .	138	0	0
E. PROCTOR (accepted) . . . . .	130	0	0

## Grove Street.

J. Harries & Co. . . . .	£169	0	0
H. Groves . . . . .	156	0	0
W. J. Howie . . . . .	155	15	0
Sayer & Son . . . . .	147	0	0
W. Banks . . . . .	138	10	0
E. Proctor . . . . .	130	0	0
G. KEMP (accepted) . . . . .	125	0	0

## High Street, Plumstead.

Hayter & Son . . . . .	£230	0	0
Sayer & Son . . . . .	205	0	0
W. Jolly . . . . .	154	10	0
E. Proctor . . . . .	150	0	0
G. KEMP (accepted) . . . . .	140	0	0

## Plumstead Road.

Hayter & Son . . . . .	£260	0	0
Black & Son . . . . .	203	0	0
J. Chessum & Sons . . . . .	203	0	0
J. & C. Bowyer . . . . .	189	0	0
T. D. Leng . . . . .	184	0	0
G. Kemp . . . . .	160	0	0
Sayer & Son . . . . .	151	0	0
E. PROCTOR (accepted) . . . . .	135	0	0

## Trundley's Road.

J. Harries & Co. . . . .	£163	0	0
A. Black & Son . . . . .	137	0	0
W. Banks . . . . .	129	15	6
H. Groves . . . . .	129	0	0
E. Proctor . . . . .	120	0	0
Holliday & Greenwood, Ltd. . . . .	114	0	0
G. Kemp . . . . .	110	0	0
W. J. HOWIE (accepted) . . . . .	108	10	0

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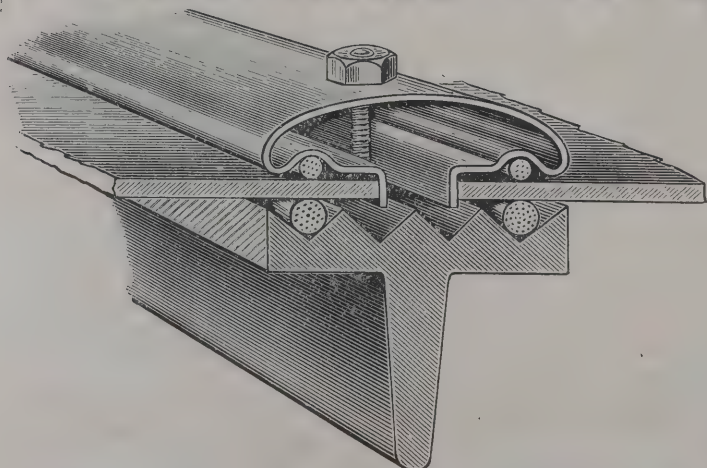
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Chisenhall Road.

W. Shurmur	£183	0	0
Silk & Son	173	0	0
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Corfield & Co.	128	0	0
G. Barker	126	10	0
A. W. DERBY (accepted)	113	10	0

Hague Street.

J. F. Holliday	£260	0	0
C. Willmott & Son	210	0	0
Corfield & Co.	180	0	0
Vigor & Co.	169	0	0
W. Shurmur	160	0	0
G. BARKER (accepted)	149	15	0

Wilton Road.

J. F. Holliday	£300	0	0
J. Chessum & Sons	280	0	0
McCormick & Sons	258	0	0
Silk & Son	245	0	0
W. Martin	236	0	0
Barrett & Power	219	0	0
C. Willmott & Son	219	0	0
M. PEARSON (accepted)	173	0	0

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H. & G. Mallett	£264	0	0
W. H. Lorden & Son	166	15	0
Lathey Bros.	159	0	0
Rice & Son	153	0	0
E. Flood	145	10	0
E. Triggs	140	0	0
J. Garrett & Son	121	0	0
E. B. TUCKER (accepted)	120	0	0

Salter's Hill.

H. Line	£260	0	0
Rice & Son	249	0	0
J. Garrett & Son	237	0	0
W. H. Lorden & Son	222	15	0
H. Leney & Son	208	0	0
A. Acworth	207	0	0
J. & C. Bowyer	197	0	0
G KEMP (accepted)	178	0	0

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W. Hooper	£246	10	0
Sayer & Son	178	0	0
Rice & Son	163	0	0
Maxwell Bros., Ltd.	159	0	0
E. TRIGGS (accepted)	139	0	0

Shillington Street.

J. & M. Patrick	£385	0	0
W. Hammond	370	0	0
Rice & Son	355	0	0
C. Gurling	337	0	0
E. Flood	292	0	0
Lathey Bros.	290	0	0
J. Garrett & Son	288	0	0
E. TRIGGS (accepted)	225	0	0

Broomsleigh Street.

W. Hornett	£170	0	0
T. Cruwys	157	10	0
Bristow & Eatwell	155	0	0
F. Chidley	151	12	0
Marchant & Hirst	148	0	0
F. T. Chinchin & Co.	134	0	0
W. CHAPPELL (accepted)	129	10	0

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A. J. Sheffield	£437	0	0
Unsigned	324	0	0
A. W. Derby	305	0	0
Corfield & Co.	287	0	0
Gibb & Co.	274	0	0
Vigor & Co.	249	0	0
HAYDON & SONS (accepted)	247	0	0
T. H. Jackson	238	0	0

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A. W. Derby	622	0	0
Corfield & Co.	594	0	0
J. F. Holliday	540	0	0
Haydon & Sons	468	18	0
Vigor & Co.	410	0	0
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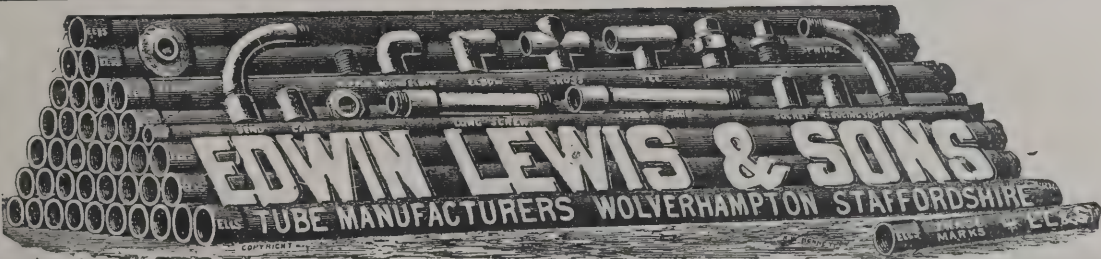
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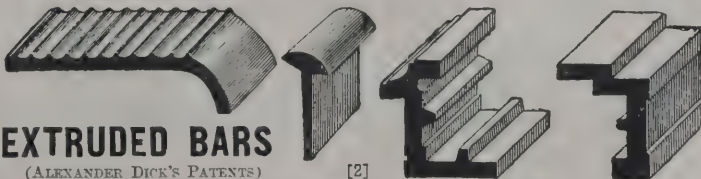
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Bristow & Eatwell . . . . .	135	0	0
F. Chidley . . . . .	125	0	0
F. T. Chinchin & Co. . . . .	124	0	0
W. Chappell . . . . .	120	0	0
MARCHANT & HIRST (accepted) . . . . .	106	0	0

## Faunce Street.

Sayer & Son . . . . .	£138	0	0
J. F. Ford . . . . .	129	0	0
J. Appleby . . . . .	110	0	0
MAXWELL BROS., LTD. (accepted) . . . . .	81	0	0

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H. Line . . . . .	£220	0	0
A. Black & Son . . . . .	186	0	0
Sayer & Son . . . . .	173	0	0
J. Appleby . . . . .	172	0	0
J. Harries & Co. . . . .	165	0	0
Rice & Son . . . . .	163	0	0
LATHEY BROS. (accepted) . . . . .	163	0	0

## New Road.

Hudson Bros. . . . .	£187	10	0
Rice & Son . . . . .	143	0	0
Lathey Bros. . . . .	137	0	0
E. Flood . . . . .	127	0	0
E. B. Tucker . . . . .	122	11	0
E. Triggs . . . . .	122	10	0
MAXWELL BROS., LTD. (accepted) . . . . .	106	0	0

## MANSFIELD.

For erection of plant for the distribution of electricity for lighting the villages around Elmlton-with-Creswell.

J. DAVIS & SON, LTD, All Saints Works, Derby (accepted) . . . . . £590 10 0

## MARLBOROUGH.

For laying about 1,720 lineal yards of 3-inch water-mains, with valves, hydrants, &c Messrs. FAIREBANK & SON, engineers, 13 Lendal, York.

J. JACKSON, Plaistow, E (accepted) . . . . . £489 8 10

## MATLOCK.

For driving an adit (about 150 lineal yards) at the boring on Matlock Moor, Derbyshire, for the Matlock Urban District Council. Mr. JAMES DIGGLE, engineer.

T. B. HALLSWORTH, Crich, Derbyshire (accepted).

## MERTON.

For erection of parish offices. Mr. H. G. QUARTERMAIN, architect. Quantities prepared by Mr. W. W. DEARLE, Broad Street House, E.C.

Burnand . . . . .	£1,984	0	0
Nightingale . . . . .	1,975	0	0
Parsons & Townsend . . . . .	1,943	0	0
Holliday & Greenwood . . . . .	1,888	0	0
Richardson . . . . .	1,872	0	0
Bulld . . . . .	1,793	0	0
Lorden . . . . .	1,766	0	0
Burges . . . . .	1,550	0	0

## MORTLAKE.

For constructing sewers and making-up road, Leinster Avenue. Mr. WILLIAM H. BURT, surveyor, 10 Bush Lane, E.C.

Killingback & Co. . . . .	£2,057	0	0
J. A. Stayner . . . . .	2,049	0	0
Kavanagh & Co. . . . .	1,779	0	0
Neave & Son . . . . .	1,731	0	0
WIMPEY & CO. (accepted) . . . . .	1,585	0	0

## NEW BARNET.

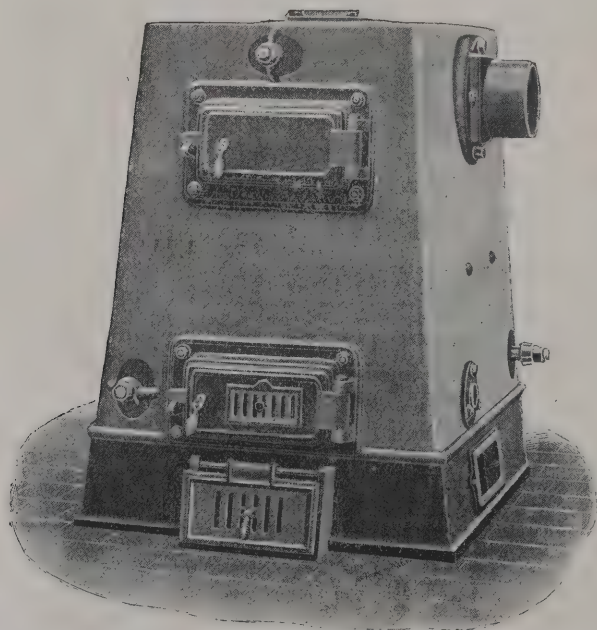
For street works in Woodville Road, New Barnet. Mr. HENRY YORK, surveyor.

## Making-up road.

Wallace & Inns . . . . .	£746	0	0
J. A. Dunmore . . . . .	645	8	0
E. Rogers & Co. . . . .	598	0	0
M. S. Kitteringham . . . . .	547	0	0
T. Adams . . . . .	520	0	0
G. BELL, Tottenham (accepted) . . . . .	479	0	0

## Tar-paving footpaths.

J. A. Dunmore . . . . .	112	0	0
M. S. Kitteringham . . . . .	95	10	0
T. Adams . . . . .	80	0	0
Wallace & Inns . . . . .	66	0	0
Grounds & Newton . . . . .	63	16	0
J. Wainwright . . . . .	63	0	0
GODDARD & CO., Caledonian Road, (accepted) . . . . .	62	0	0



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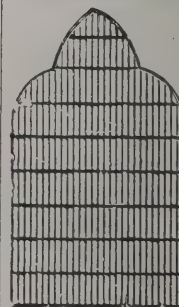
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**NEWCASTLE-ON-TYNE.**

For supply of tramrails and fishplates for the tramway extension to Walker. Mr. JOHN EDGE, city engineer.  
M. A. POTTS & Co., Manchester (*accepted*).

**NEWHAVEN.**

For general repairs and internal painting and decorating at the workhouse.

E. Hammond . . . . .	£3,799	0	0
W. Wells . . . . .	3,060	0	0
PEERLESS, DENNIS & Co., Eastbourne ( <i>accepted</i> ) . . . . .	2,968	0	0
Noakes & Son . . . . .	2,893	0	0

**NORWICH.**

For enlargement of the dust destructor.

HORSFALL DESTRUCTOR CO ( <i>accepted</i> ) . . . . .	£1,600	0	0
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**OSWESTRY.**

For erection of extensions to the market buildings in Bailey Street. Mr. G. WILLIAM LACEY, borough surveyor.

H. Price . . . . .	£1,305	0	0
W. Felton . . . . .	1,296	0	0
J. Higgins . . . . .	1,249	10	0
W. H. THOMAS, Oswestry ( <i>accepted</i> ) . . . . .	1,099	0	0

**RAMSGATE.**

For construction of sea-defence works and groyne on the East Cliff, Ramsgate. Mr. T. C. TAYLOR, borough surveyor.

W. Manders . . . . .	£13,024	0	0
J. & T. Binns . . . . .	11,903	6	6
A. E. Nunn . . . . .	11,726	4	0
Castle & Co. . . . .	10,745	16	0
J. J. Wise . . . . .	10,668	0	0
Paramor & Sons . . . . .	10,087	14	3
A. Fasey & Son . . . . .	9,996	17	6
A. Woodhouse . . . . .	9,670	0	0
W. Wilson . . . . .	9,438	10	0
J. Trueman . . . . .	8,950	0	0
T. T. Denne . . . . .	8,287	0	0
G. Bell . . . . .	8,063	5	6
B. Cooke & Co. . . . .	6,333	0	0
CASE SEA-DEFENCE SYNDICATE LTD, London ( <i>accepted</i> ) . . . . .	6,079	10	3

**RAMSBOTTOM.**

For street works in Shilton Street. Mr. T. H. BELL, surveyor.			
Platt & Castle . . . . .	£146	0	0
F. Hayes . . . . .	140	18	0
Ratcliffe & Woodhead . . . . .	128	15	6
J. NUTTALL, 113 Victoria Street, Ramsbottom ( <i>accepted</i> ) . . . . .	93	0	2

**SCOTLAND.**

For erection of a dwelling house and shops at Aboyne, Aberdeen. Mr. WILLIAM E. GAULD, architect, 258 Union Street, Aberdeen.

*Accepted tenders.*

J. Gerrie, Cambus-o'-May, mason . . . . .	£191	10	10
A. Innes & Sons, 59 Broad Street, Aberdeen, carpenter . . . . .	174	7	0
R. Wright & Son, Aboyne, slater . . . . .	37	1	8
C. Abel, Westfield, Ballater, painter . . . . .	30	12	10
Munro & Wright, Aboyne, plasterer . . . . .	32	0	0
W. Simpson, 446 Union Street, Aberdeen, plumber . . . . .	27	10	0

**SEFTON.**

For erection of a wrought-iron fence at the sewage works, Kirby, Liverpool.

J. R. & T. ASHMORE, Westmoreland Place, Scotland Road, Liverpool ( <i>accepted</i> ) . . . . .	£24	4	0
--	-----	---	---

**STANLEY.**

For construction of a main pipe sewer for the drainage of Bottomboat, with manholes, lampholes, &c. Mr. FRANK MASSIE, engineer, Tetley House, Wakefield.

W. Jowett . . . . .	£2,863	0	0
Ward & Tetley . . . . .	2,364	13	9
Binks Bros. . . . .	2,250	0	0
A. C. Harris . . . . .	2,065	12	10
S. Hall . . . . .	1,983	9	4
T. Egan & Sons . . . . .	1,878	8	10
M. Arundel . . . . .	1,818	14	0
W. Doleman . . . . .	1,790	15	10
T. & G. WILSEN, Wakefield ( <i>accepted</i> ) . . . . .	1,715	0	0

**STRENSALL.**

For erection of six houses at Strensall, Yorks. Mr. THOMAS STOKES, architect, Thirsk.

J. SIMPSON, East Parade, Heworth, York ( <i>accepted</i> ) . . . . .			
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## WALES.

For erection of four cottages at Pyle, Glamorgan. Messrs. THOMAS & JAMES, architects, Aberavon.

Anderson & Vaughan . . . . . £1,320 0 0  
W. J. Jackson . . . . . 928 0 0  
HOWELL & COCKWELL, Aberavon (*accepted*) . . . . . 856 0 0

For renovation of the Bethel church, Upper Cwmbran.

E. Jones . . . . . £45 7 6  
L. WILLIAMS, Pontnewydd (*accepted*) . . . . . 37 0 0  
W. T. Watkins . . . . . 35 3 3  
C. Cawley . . . . . 31 7 0  
J. Boyt . . . . . 25 5 0

For erection of a minister's manse at Pentrefelin, N.W. Mr. G. DICKENS-LEWIS, architect, Talbot Chambers, Shrewsbury.

R. A. JONES, Llanfyllin (*accepted*) . . . . . £363 0 0

For cleaning, painting and colouring the inside, and for cleaning and painting the outside wood and ironwork of the Board schools at Mold and Buckley.

*Accepted tenders.*

E. Manley, Mold, Mold school . . . . . £64 10 0  
R. Peters, Buckley, Chester, Buckley school . . . . . 48 15 0

## WEST BROMWICH.

For supply of a 10-ton compound steam road-roller, fitted with a Morrison's scarifier. Mr. ALBERT D. GREATORREX, borough surveyor.

T. C. AVELING & Co, Meriden Street, Birmingham (*accepted*).

*Received too late for Classification.*

## EALING.

For road and sewers on Ealing Park estate, South Ealing.

Messrs THOS. DINWIDDY & SONS, surveyors.  
NEAVE (*accepted*) . . . . . £999 0 0

## HENDON.

For road and sewers on Hale Grove estate, Mill Hill, Hendon.  
Messrs. THOS. DINWIDDY & SONS, surveyors.

Dickson . . . . . £1,102 0 0  
Halsey . . . . . 1,077 0 0  
Killingback . . . . . 1,030 0 0  
Ballard . . . . . 957 0 0  
Adams . . . . . 939 0 0  
NEAVE (*accepted*) . . . . . 934 0 0

## HULL.

For taking-down part of the existing premises and rebuilding the Empress inn, Alfred Gelder Street. Mr. JOSEPH H. HIRST, architect.

F Southern . . . . . £2,328 0 0  
M. Harper . . . . . 2,287 0 0  
T. Goates . . . . . 2,156 0 0  
Hockney & Liggins . . . . . 1,994 0 0  
HULL JOINERS, LTD., Charlotte Street . . . . . 1,916 0 0

## TRADE NOTES.

THESE entrance gates were executed by Mr. Dixon Pownner, Leeds, and erected for the Corporation at Roundhay Park.



They were afterwards duplicated for East End Park, another suburb of Leeds.

MESSRS. E. A. BROWN & Co, of Collyhurst Wireworks, Manchester, announce that owing to the expansion of their business they have had to erect spacious new works in Eggington Street, Rochdale Road.

MESSRS. GOODWIN, BARSBY & Co., engineers and iron-founders, St. Margaret's Ironworks, Watling Street, Leicester, have received the order from the Derwent Valley Water Board for one of their 21-inch by 10-inch patent Acme stone breakers, with screen.

THE inhabitants of Cloughton, near Scarborough, have decided to commemorate the Coronation of King Edward VII. by placing an illuminated clock and bell in their new village schools, and have placed the order with Messrs. W. Potts &



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ADDITIONS, SOLSGIRTH. DOLLAR, N.B.

PROPOSED HOUSE ON THE MEDWAY.

PREMISES, 74 CHEAPSIDE, E.C.

Sons, clock manufacturers, Guildford Street, Leeds, and Town Hall Buildings, Newcastle-on-Tyne.

MESSRS GEORGE MILLS & Co, hydraulic engineers and ironfounders, of Globe Iron Works, Radcliffe, Manchester, ask us to mention, apropos of the illustration which we published last week of the new premises at Dalston erected by The Shannon Company, Ltd, that this building is protected throughout from fire by Titan automatic sprinklers, of which they are the sole proprietors and manufacturers.

## BUILDING AND BUILDERS.

THE memorial-stone of the new United Free church at Culter, Aberdeenshire, was laid on the 6th inst.

THE quarterly meeting of the executive of the Scottish Building Trades' Federation was held on the 7th inst. at the Station hotel, Stirling, Mr. Robert Lamb, builder, Edinburgh, president, in the chair. Members were present from various parts of the country. The report, which was submitted by the secretary, Mr. James L. Selkirk, C.A., Glasgow, referred to the principal matters which had been engaging the attention of the executive and the progress that was being made. In particular the question of still more complete organisation in the several districts was fully considered, and an earnest appeal made for hearty co-operation. Progress was reported in regard to various questions which had been under consideration at previous meetings. The visitation of sundry districts was strongly recommended so as to keep the members in touch with the work of the Federation and to deepen their interest in it. The state of the finances called for special attention, and a scheme was submitted for placing these on a more satisfactory

footing. Much importance was attached to the cultivation of closer relations with kindred associations, and specially with the National Federation of Building Trade Employers, which was doing valuable work in organising the various trades, chiefly throughout England. Interesting discussions took place on the various subjects treated in the report, and resolutions adopted bearing on future work. The annual meeting of the Federation was appointed to be held in Edinburgh in October next. A vote of thanks was awarded to the chairman for presiding.

## VARIETIES.

AT a special meeting of the York City Council Mr. R. Percy Dale, an alderman of the city, was elected town clerk and clerk of the peace at a salary of 700l a year, in the place of Mr. W. H. Andrew, who has been appointed to St. Helens.

THE funeral of the late general secretary of the United Operative Plumbers' Association of Great Britain and Ireland (Mr. G. B. Cherry, R.P.) took place on the 11th inst. at the Southern Cemetery, Manchester. There was a large attendance of plumbers from the centres of the United Kingdom as well as from Manchester and the district. Among those present were Mr. J. Beal, R.P., secretary of the National Association of Master Plumbers, Mr. Jaffrey, Mr. Lightfoot, and a number of past presidents and members of the Association, also Mr. W. R. E. Coles, clerk of the Worshipful Company of Plumbers.

THE Bishop of St. Asaph officiated at Shotton-in-Hawarden on the 7th inst. at the consecration of the new St. Ethelwold's Church, the erection of which has cost about 7,000l. The new church is of a spacious character, built of Staffordshire sandstone, with a clerestory, western gallery and an apse capable of holding 600 persons. There are three sets of windows in the east end, one erected to commemorate the independence of Crete, given by the Byron Society, and the other two are memorials to the late Miss Davison, given by her nephews and nieces. The south aisle is to the memory of the late Mr. Gladstone, chiefly given by Mrs. Wickham. In the gallery are three stained windows, given to the memory of the late Mr. Gladstone by his grandchildren from Lincoln. The gallery is approached by a flight of steps from the porch. The floors of nave, aisles and choir are laid with floor blocks, the chancel with small black and dove-coloured tiles. The step and floor in the sacrum under the altar table is in marble. The

# The "ONE" Range.

PATENT 1331/01.

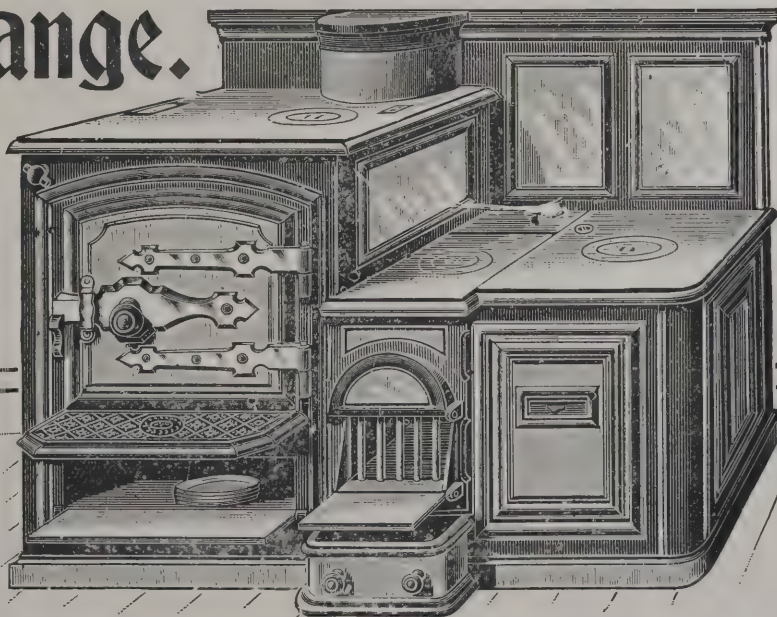
M. F. Co. LD. R.

These Ranges are Exhibited by the following London Firms:—

R. ADAMS, Newington Causeway;  
CLARK, HUNT & CO., Shoreditch;  
O'BRIEN, THOMAS & CO., Upper Thames Street;  
R. H. & J. PEARSON & CO., Ltd., Notting Hill Gate;  
TOWNSON, DREW & CO., Queen Victoria Street.

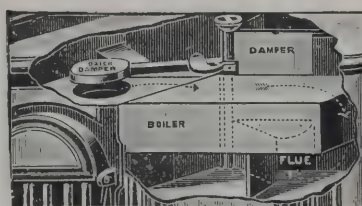
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THE WELL FIRE CO., Ltd.

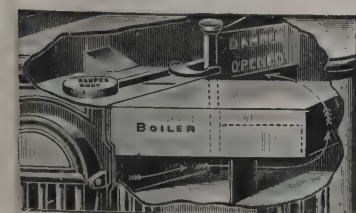


This Independent Range is fitted with hot water circulating boiler as shown in the sections, and the heat of the fire passes direct under the bottom of the oven.

A Fire Brick Dome and damper is fitted over the fire, which enables the heat to be concentrated at pleasure on the hot plate or boiler, the waste heat of either passing under the other, thereby utilising what is usually lost.



The above shows the heat of the fire concentrated on the hot plate and the waste heat passing under the boiler.



The above shows the heat concentrated under the boiler and the waste heat passing under the hot plate.

The casing and oven door are lined with slag wool and a third oven can be arranged if required.



pulpit and font are carried out in stone, the former having open arcing and carved paterae, the latter being in Helsby stone, with carved emblem and appropriate inscriptions, and is the gift of local subscribers, the result of the efforts of the children of the parish. The nave and aisles are seated throughout with chairs, the chancel having oak choir fronts and prayer desks. The altar table is of oak. The reredos above is of wood, carved, painted and decorated, and contains subject panels of Our Lord in Majesty and adoring angels. The church is lighted throughout by suspended oil lamps. Although the main edifice has been completed, it still wants a steeple, a boundary wall and an organ before the original plan can be said to be carried out in full detail, and these will be supplied as the funds allow. The work has been carried out by Messrs. J. Ward & Son, of Uttroter, from the design of Messrs. Douglas & Minshall, of Chester.

#### "SOLOMON'S AQUEDUCT."

IN a report to the Foreign Office on the trade of Palestine during 1901 Mr. Consul Dickson has an interesting passage on the water-supply of Jerusalem:—"In the way of public works the most noteworthy undertaking during the year was that for supplying Jerusalem with water, which was brought in iron pipes from a spring situated about seven miles distant south of the city, and known as the "Sealed Fountain" of Solomon's times. "The threatened water famine," says Mr. Dickson, "which was only prevented through the timely assistance of the railway company, caused the municipal authorities to realise the necessity of providing in future for any emergency of this nature, and accordingly a petition was forwarded to Constantinople asking permission to utilise a portion of the revenues of the "Evkaf" (religious endowments) for the purpose of providing Jerusalem with a water-supply. The request was granted, and £6,000 were set aside for carrying out the enterprise. A commission of local officials was formed to supervise the undertaking, and an engineer from the Public Works Department at Constantinople was employed for doing the work. A portion of the old stone aqueduct known as "Solomon's Aqueduct" was to be used where it could easily be repaired, but for the greater part of the distance nearly seven miles of 4-inch iron pipes were required. No notice calling for tenders was issued by the authorities; nevertheless, a British firm was communicated with on the subject, who offered to supply the

pipes in question at 4 f 25 c. (3s. 5d.) the metre, c.i.f. Jaffa. But the offer arrived too late, a local German merchant having already obtained the order, and signed the contract with the municipal authorities for furnishing the requisite number of pipes from Antwerp in Belgium at 4 f. 90 c (3s. 11d.) the metre, c.i.f. Jaffa. The work was carried out with energy and expedition, although the pipes were hastily laid, and was completed by November 27, the anniversary of the Sultan's birthday, when the inauguration ceremony took place. Two public fountains have been erected, one within the city, in the enclosure of the Great Mosque, and another outside the walls for the use of the inhabitants. The supply of water is, however, far from adequate for the requirements of a city of the size of Jerusalem, but is a boon to the poorer classes, and in times of scarcity of rain will help to avert a water famine, such as Jerusalem was threatened with last year.

#### BRIDGING SYDNEY HARBOUR.

PREVIOUS to 1857 communication between the two Sydney shores was conducted by means of ferry and row boats, but in that year a wooden bridge, constructed by private enterprise, at a cost of 75,000£, was opened, a toll being levied on each passenger, vehicle or animal crossing. In 1884 the bridge was purchased for the sum of 40,000£ by the State Government, and the tolls abolished. This was followed by such a rapid expansion of passenger and vehicular traffic that a new bridge became indispensable, and after various preliminaries, competitive designs were invited from various parts of the world, that obtaining the first premium being estimated to involve a cost of 295,700£. Ultimately it was arranged that the new bridge should be constructed from designs prepared by Mr. Percy Allan, M Inst C.E., one of the engineers in the State Department of Public Works, and an Australian by birth, a commencement being made with the actual work in September 1899, and the structure formally opened on June 28, 1902, by Sir Harry Rawson, the State Governor, assisted by the Hon. E. W. O'Sullivan, State Minister for Public Works.

The new bridge is one of the largest and most substantial yet constructed in the Commonwealth, and the experience gained during the progress of the work will naturally be utilised in connection with the proposed construction of the

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immense bridge across Sydney Harbour. The total length of the Pyrmont Bridge and its approaches is 1,758 feet, the bridging occupying 1,200 feet, of which 223 feet represent the length of the swing span. The area of the latter, 12,000 superficial feet, compares favourably with the 10,600 feet of the Newcastle-on-Tyne bridge swing, the 9,400 feet of the swing bridge in connection with the Manchester Ship Canal, and the 8,700 feet of the bridge swing at Hawarden. There may be larger bridge swings in the United States, but none constructed in a manner more up to date than at Pyrmont.

The heaviest work was in connection with the sinking of the caisson forming the main support of the bridge swing. This huge chamber, having a diameter of 42 feet, was commenced on August 2, 1900, and a few weeks later was completed sufficiently to permit of its being grounded, by means of girders and wedges, in the position it was intended to permanently occupy. Then it was gradually worked down a depth of 46 feet below low-water mark, at which point the cutting edge touched rock on one side. The necessary damming having been completed, the water was pumped out and excavations carried on in the "dry" until a "blow" occurred, when the work had to be continued with the surface of the rock under water. The caisson, when the work of sinking had been completed, was filled with a solid mass of stone and concrete, representing a dead weight of over 6,800 tons.

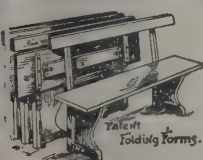
Electricity supplies the motive power for working the bridge swing: its slewing, the lifting of the ends, the operating of the gates closing the traffic, and the lighting of the roadway being controlled by a man stationed in the conning tower on the centre of the bridge. So perfect are the arrangements that by simply pressing a button the bridge—weighing 800 tons—can be opened or closed in forty-four seconds. Both the slewing and lift motors are carried on a platform inside the drum, the former working through a train of gears a vertical shaft, on the lower end of which is a cast-steel rack secured to the top of a pivot pier, while the end lift is effected by means of cones on horizontal shafts worked by a 35 horse-power motor gearing on to a longitudinal shaft running the whole length of the bridge span. The materials used in the latter were iron and stone, Australian hardwood being largely employed in the construction of the other spans, twelve in number, each having a length of 82 feet; while the roadway, which is 4 feet wider than that of the Tower Bridge, London, is asphalted.

## FORESTRY IN SAND-HILLS.

To make a desert productive by growing forests where probably no trees ever grew before, to modify climate and protect field crops by checking the hot winds which wither and destroy, to place within convenient reach of a rich agricultural country a cheap and permanent source of timber supply—these, says a writer in the *New York Times*, are the results which the Bureau of Forestry confidently expects to secure by the work it has just begun in the sand-hill country of Nebraska. The President recently put his approval on the scheme by declaring 211,000 acres of the public lands of Nebraska forest reserves. Two reserves were created—one, called the Dismal River reserve, between the Dismal and Middle Loup Rivers, with 86,000 acres; the other, the Niobrara reserve, with 125,000 acres, between the Niobrara and Snake Rivers. The division of tree-planting of the Bureau of Forestry has now its experts in the field selecting suitable places for forest nurseries and plantations. In a few years thousands of acres of trees will have been set out, and forests created by artificial methods will have begun their struggle for life in one of the great deserts of the Middle West.

The Nebraska work marks an advance in forest policy in America, and a very important one. Hitherto the Government has been content to acquire and administer lands which were already wooded. But in undertaking the Nebraska work the bureau has declared its policy of growing forests as well as administering those which already exist; it has undertaken the task of creating sources of timber supply on land that cannot profitably grow field crops. If the undertaking succeeds, or even if it shows in the next few years the proof of its ultimate success, its result is sure to be manifested in the creation of more reserves in the prairie lands of the Middle West and the planting of forests on a far larger scale. The sand-hill country occupies about a third of Nebraska, and lies in the centre of the State. Geologists believe the country was once the bed of an inland sea whose sandstone deposits, under the wearing influence of the prevailing north-west winds, have crumbled into sand and been heaped up in drifts and mounds. The sand-hills have been piled at right angles to the wind, that is from south-west to north-east, and this is the course taken by the rivers which flow through the country. It is the general belief that a great underground flow of water passes through the sand-hills and drains the

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entire area. It has often been observed that no matter how dry the season may have been or how long the hot winds may have been blowing, the sand only a few inches beneath the surface is always moist.

Trees with roots long enough to penetrate into the damp rich soil find abundant nourishment, and thrive accordingly. The bull pine has a long tap root, which goes down straight as a plumb to the wet sand beneath. However scanty the rainfall, this tree is secure from drought by reason of its store of moisture under ground. The Bureau of Forestry has planned to plant up the sand-hill reserves gradually with trees by making small plantations of 4 or 5 acres in the most favourable parts of the country, and gradually extending them until they ultimately merge together in a continuous forest. Thus widespread mistakes will be avoided, and the conduct of one plantation will affect the treatment of the rest. The forest planting in the sand-hill country is watched with friendly interest by the people of Nebraska, who feel confident of its success, now that the Government is behind it. The work means much to them, for if it succeeds on the limited area included in the forest reserves, it should succeed anywhere in the fifteen millions of acres of unproductive land in the entire sand-hill country and thus increase tremendously the value of a third of the State's area.

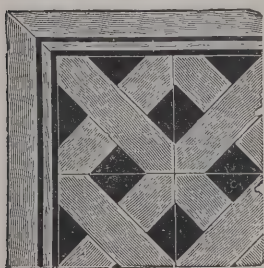
### THE PASSING OF NEWGATE.

PREPARATIONS for the demolition of the female wing at Newgate Prison have been completed and the work is about to be commenced. The statements (says the *City Press*) which have appeared to the effect that workmen are engaged in pulling down the historic prison itself are without foundation, as nothing can possibly be done in that direction until the new temporary cells have been built. In the meantime, however, changes have taken place in the old prison, as the gallows have been taken down and removed to Pentonville, where, it is anticipated, future executions will take place. It may not be generally known that in the building of Newgate Prison some magnificent Portland stone was used. It is the intention of the Corporation to utilise these great blocks of stone in the building of the new Sessions House, which will be on the site of the present prison-fortress. Strange to say, nearly every block of Portland bears upon it what is known as a quarry mark, that is to say, each gang of prisoners

at the quarries had their own particular mark, and the fact is apparent to an expert observer of the stone. The female wing, which lies at the back of the prison, was completed about the year 1852, and the outer walls are of great strength. The place is built in galleries, and was evidently intended to resist the attacks of time. It has not been used as a prison for a great many years, and has consequently fallen into a somewhat bad state of repair. The doors of the old-fashioned and darksome cells have been taken away, and will be used in connection with the new cells, which are being constructed on a very up-to-date principle. Scarcely any wood is being used in their erection, the framework being composed of steel sections, which are covered with concrete, and finally receive a coating of cement. Nearly 5,000*l.* is being expended on the construction of these new cells, which will be in use for some five or six years. The work is expected to be finished in October.

### ROWTON HOUSE No. 5.

A PARTY of guests was invited to a private view on Wednesday (the 6th inst.) of the latest addition to London's Rowton Houses which, as our readers are aware, are the splendid outcome of Lord Rowton's beneficent scheme for the amelioration of the conditions under which the working classes pass their lives. This new building, which has arisen in Fieldgate Street, Whitechapel, is the fifth which has been erected by Lord Rowton's company, Rowton Houses, Ltd. It is the largest which has so far been built, and provides accommodation for no fewer than 816 lodgers, each of whom has a separate room containing a bedstead with spring mattress, overlay and full complement of bedding, and other necessary furniture, the charge for which is only 6*d.* per night. The elevations of the new building are in pressed Leicester facing brick, relieved with Fletton brick and dressings of pinky buff terra-cotta. The frontage is flanked by towers which, with the accessories of the main entrance, constitute the chief architectural attractions, in so far as external appearances are concerned. For administrative purposes the interior, whose walling is built of Fletton and glazed brick, divides itself into five sections, under the heads of the superintendent's and office clerks' apartments, those of the bed-makers, the catering department (including accommodation for females employed in kitchen, scullery and store shop), the lodgers' day-rooms and their cubicles. The day-rooms are on the ground floor, where



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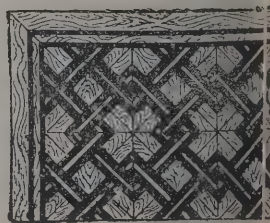
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one of the most prominent features off the main corridor leading from the main entrance is the dining-room—a spacious and handsome place, with large windows and ventilating top lights. Seating is here provided at tables for 456 men, besides extra seats and easy chairs, which are also for the benefit of the diners. The floor is laid with wood in the herring-bone fashion, whilst the walls are adorned with a high dado of glazed brickwork, in tints of cream and chocolate. Pictures are hung in frames around, and the general effect is one of sprightly airiness and comfort, which may be said to characterise the day-rooms throughout. This is particularly so in the reading and smoking-rooms, both of which are large and long. In the former are two bookcases in polished oak, containing together between 400 and 500 volumes by standard authors and various modern writers of note on sundry themes. The leading daily newspapers and magazines are likewise to be supplied in the reading-room. A considerable portion of the wall space is devoted to a series of panels emblematic of the seasons, these having been specially painted by Mr. H. F. Strachey, and generously presented to the House by the artist. Each season is represented by the figure of a workman engaged in seasonable avocations, and by larger compositions bearing on the same subject; and in a central position over a fireplace there appears an allegorical sketch, in which sits enthroned a symbolical figure of England, to whom the fruits of the land are being brought by the cultivators. The reading-room is provided with teak seats and tables for 168 lodgers, and the smoking-room, equally well furnished for its purpose, affords accommodation for 140. In addition to a long corridor elsewhere, provided with garden chairs, there is on the flat, extensive roof of the dining-room an open-air lounge with similar furniture, and with big pots of plants and flowers. Amongst other requisites, not to say luxuries, in this workmen's hotel are dressing-rooms where the men may change their garments during hours when the cubicles or bedrooms are not accessible; bathrooms with ivory-glazed fire-clay baths; feet-washing troughs supplied, like the baths, with hot and cold water; wash-houses, with troughs where the lodgers may wash their own clothes; a room where they may dry their clothes on a wet day and one where they may clean their clothes and boots; two rooms for tailoring and shoe-making, a barber's shop, with hot and cold water and the usual fittings. One of the most important essentials is the catering department. The kitchen is fitted up with ranges, gas and steam-cooking apparatus, dressers, cup-

boards and cook's store; the scullery, with large teak sinks and draining boards, plate-racks and other requirements, and the larder is also equipped in the most approved style of the period. The arrangements as to food have been very carefully devised for the benefit of the guests, who may bring their own meat or get it at the lowest possible price from the stores, and may cook it themselves or get it cooked for them at a very trifling cost. The catering department, as the secretary (Mr. Dulake) points out, is not in itself a paying concern, and an idea of the prices generally may be gathered from the fact that the charge for a cubicle, with the use of day-rooms, lavatories and other conveniences is only 6d. per night. The lodgers' cubicles, which occupy a big building of five floors at the back or eastern side of the establishment, are arranged along corridors with dividing spaces, planned with the objects of affording the best possible ventilation, reducing the risks of fire to a minimum and obtaining isolation in case of any appearance of infectious disease. There is an extensive system of lockers where the lodgers may keep clothes, even umbrellas and other articles, each of the 816 having a key differing from all the rest. The floors of the house generally are fireproof. The sanitary arrangements appear to be especially satisfactory. The lighting throughout is electric.

### CONTRACTOR OR WORKMAN?

At the Cardiff County Court last week Judge Owen heard an application for arbitration under the Workmen's Compensation Act by John Chapman against John Williams & Son, of the Globe Foundry, the Moors, Cardiff. The facts, which were admitted, were that the applicant, who had formerly been in business on his own account, and was subsequently manager of the Globe Foundry, was engaged in April last to make some brackets for the Minehead Pier. Whilst engaged on the work one of the brackets fell upon him, crushing some of his toes, and one toe was amputated. The point in dispute was whether the applicant was engaged by the day or as a contractor. On some occasions it appeared that he took work on contract for the respondents, but on other occasions he was paid by the day at the rate of 10s. per day. Applicant had two sons working with him, and one account was presented, in the instance under consideration, and was paid by the respondents to the applicant, the account showing that the applicant was paid at the rate of 10s. per day and the sons at 8s. each per day. His

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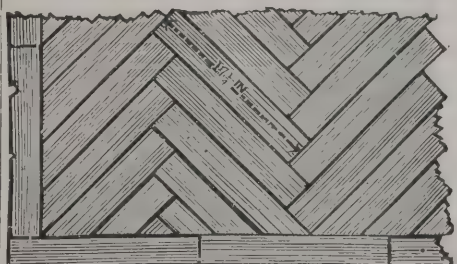
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Honour found as a fact that the applicant was a workman within the meaning of the Act, and awarded compensation at the rate of 20s. per week with costs, and to date from two weeks after the accident.

### SANITATION IN MIDDLESBROUGH.

A PAPER describing the sanitary progress of Middlesbrough during the last quarter of a century was read by Mr G. H. Anderson, the chief sanitary inspector of the borough, at the Sanitary Inspectors' Congress. He said that when it was remembered that the first house built in the town was erected in April 1830, and that now, only seventy-two years after, their population numbered about 95,000, it would readily be understood that the difficulties encountered by the municipal authority in keeping pace with its extraordinary growth had been as numerous as they had been intricate. The subsoil of Middlesbrough was principally clay, but a portion in the Marsh district was of a peaty nature. Thousands of workmen's cottages had been erected in this district, and the weight of the buildings had been so great that the ground had settled down to a depth of about 18 inches below high-water mark. Hence, in times of high tides and heavy rainfall, the streets and houses in a portion of the district were liable to floods. The main sewers were constructed in 1871, at a cost of 88,000*l.*, but owing to the low level of the surface on which the town was built, the sewers were tide-locked twice in every twenty-four hours. A pumping station near the outfall was being constructed, and when it was completed they would be able to pump about 2,000,000 gallons per hour, and provision was made for duplicating the plant. When the waterworks extensions were complete the boroughs of Middlesbrough, Stockton and Thornaby would have an unlimited pure supply for at least the next twenty years. Describing the household sanitary arrangements, he stated that there were 4,000 midden privies—relics of the bad bygone years—but there had been no new ones added during the past twenty years. After describing the measures taken to stamp out the great small-pox outbreak of 1897-98, Mr. Anderson spoke of the slaughter-houses of the town, and lamented that butchers preferred to use small, inconvenient, private slaughter-houses rather than kill in the public abattoir.

Sir James Crichton Browne thought the death-rate of the town, although it was falling, and although considering the high birth-rate it should not unfavourably compare with other

large towns, was yet higher than it ought to be. Middlesbrough still had too much enteric fever, diphtheria, measles, far too much infantile diarrhoea and far too much pneumonia. In spite of all this, however, immense improvement was going on.

### CRYSTAL PALACE SCHOOL OF ENGINEERING.

DR. T. KIRK ROSE, assistant surveyor to the Royal Mint, presided over the annual presentation of certificates to successful students of the Crystal Palace Company's school of practical engineering.

Mr. Maurice Wilson, the vice-principal, having read the examiners' reports, which were very satisfactory, the Chairman briefly addressed the students. He said it had given him great pleasure to come down to that famous school, of which he had heard so much, and he had been very much impressed on going round the workshops by the supreme excellence of all the arrangements of the whole Institution. The great feature of the school was the close combination between theory and practice which was so necessary in engineering. It was, of course, absolutely indispensable that any theoretical knowledge should be able to be applied in practice. He reminded them that just at present students of all professions in England ought to be working very hard, as so much depended on what they did in these times of competition. If we had to get all our engineers recruited from the ranks of foreign schools we should be in a very bad way indeed. He thought that Englishmen were quite equal to any foreign competitors in the matter of civil and mechanical engineering. He then distributed the certificates, and in accordance with the recommendation of the examiners presented a medal of the School of Art, Science and Literature to Mr. L. Roberts who, in his course through the school of practical engineering, had obtained the necessary eight certificates, none of which were below third in order of merit.

Mr. Henry Gillman, manager of the Crystal Palace, proposed a vote of thanks to the examiners on behalf of the directors of the company, who, he said, would be extremely gratified to know that the work had been so good and so practical during the term.

In the course of a few remarks, Mr. J. W. Wilson, the principal, said he was sure that the school was beginning to leave its mark on the engineering profession.

A vote of thanks to the chairman concluded the proceedings.

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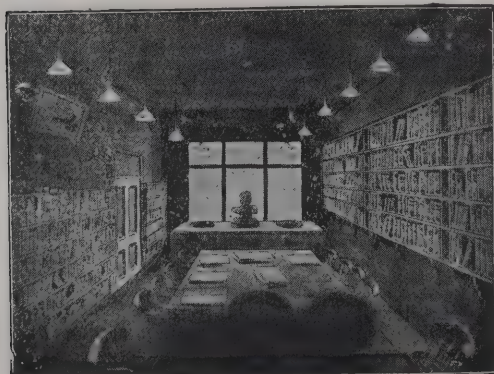
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# INSTITUTION OF MECHANICAL ENGINEERS.

A MEETING of the Institution of Mechanical Engineers has been held at Newcastle-on-Tyne, under the presidency of Mr. W. H. Maw.

One of the papers read was by Mr. W. D. Hunter, on the "Power Stations of the Newcastle and District Lighting Company." He said that the company was formed in January 1889 for the purpose of supplying the city of Newcastle-upon-Tyne and the adjoining districts with electrical energy. The nominal capital was 50,000, and the first issue of shares was limited to 15,000. Considerable delay was experienced in obtaining the necessary powers from the Board of Trade. The interval was, however, utilised for acquiring a station, and purchasing and erecting the requisite plant and machinery. A convenient and centrally-situated station near to the river Tyne was acquired, by purchasing a portion of the Forth Banks Works belonging to Messrs. R. & W. Hawthorn Leslie & Co., which originally formed their marine-engine department, previous to the establishment of the large works at St. Peter's. The station was equipped with three Lancashire boilers, 30 feet by 7 feet 6 inches, and four Parsons's single-phase turbo-electric alternating generators of 75 kilowatts capacity each. The total capacity of the Forth Banks Works at present is 3,000 kilowatts. This includes two 400 kilowatts continuous-current turbo-electric generators which were erected about two years ago, to meet the immediate demand for electrical energy for power purposes. This demand continues to grow, and in order to keep pace with it the Newcastle and District Electric Lighting Co. are now erecting at their new works in the Close two continuous-current turbo-electric generators of 1,000 kilowatts capacity each. The Forth Banks Works are peculiarly situated on the side of a hill, the engine and boiler-rooms forming terraces one above the other. Advantage of such a site could not have been taken without great expense had it been necessary to provide substantial engine foundations, but with the Parsons's turbine these can practically be dispensed with. The total area of the engine-room is only 400 square yards, and in that space, as stated above, there are fixed turbo generators representing a total capacity of 3,000 kilowatts. Water is drawn for condensers from the river Tyne. The site of the new works, at present being constructed and equipped, is immediately on the side of the river Tyne, situated about midway between the High Level and Redheugh bridges. The works when completed

will have a capacity of 12,000 kilowatts, or about 20,000 indicated horse-power. The engine and boiler-rooms, with coal-store overhead, run parallel with the river from which the circulating water for condensers will be drawn. Coal will be brought to the works in barges and conveyed to the coal-bunkers and furnaces by special plant. The workshops, stores, &c., will be situated at the east end of engine-room, where provision is left for building these on. The two turbo-electric generators are each of 1,000 kilowatts capacity, the electromotive force being 500 volts and the speed about 1,800 revolutions per minute. The steam-turbine portion of the generator is of the makers' latest improved construction, and is arranged for the full expansion of steam from the boiler pressure to that corresponding to within 1 inch of the barometer. The expansion is carried out in three barrels or cylinders of definite length and diameter to suit. The dynamos are of the latest type, and embody all the improvements which experience alone can show to be desirable. The five boilers at present erected were made by the Stirling Boiler Company. Each of these boilers is capable of evaporating 18,000 lbs of water per hour at 250 lbs. pressure per square inch. The boilers are fired with chain gate stokers, which work with absolute smokelessness in this type of boiler.

Mr. W. B. Woodhouse, of Wallsend, described the electric-supply power station at Wallsend of the Newcastle-upon-Tyne Electric Supply Company. He said:—The Newcastle-upon-Tyne Electric Supply Company has the distinction of being the first to supply electric power in bulk in this country. The Walker and Wallsend Union Gas Company obtained an Act of Parliament in 1899, authorising supply in Wallsend and Willington, a district of great manufacturing importance, extending along the riverside. The Supply Company having in view the construction of a new power-station, entered into an agreement with the Gas Company, whereby the latter took power in bulk from the Supply Company and distributed to its own customers. That portion of Newcastle originally supplied from the Pandon Dene station, the Walker urban district and Gosforth, are included in the area in which the Supply Company is authorised to distribute power. The whole scheme has been developed and carried out by Mr. Charles H. Merz, consulting engineer to both companies. The station started to supply power to local works in November 1900. Three-phase currents, at a pressure of 5,500 volts and a frequency of 40 cycles per second, are transmitted to the various sub-stations, in which, by

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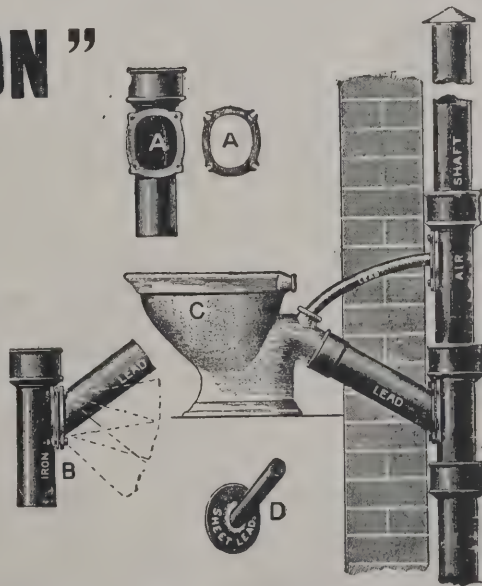
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means of synchronous motor generators and stationary transformers, conversion is made to 480 volts direct current for power and lighting on the three-wire system, and to 440 volts alternating three-phase currents for power alone. The boiler-house contains eight Babcock & Wilcox boilers, supplying steam at 200 lbs. per square inch pressure with a superheat of 120 deg. F. The engines for the three-phase generators are all of local make. A brief description follows:—One 1,400-i.h.p. engine by Messrs. the Wallsend Slipway and Engineering Co. This is a three-crank triple-expansion engine with cylinders whose diameters are 17½ inches, 28½ inches and 48 inches, the stroke of each being 36 inches, running at 100 revolutions per minute. There are three 1,400-i.h.p. triple-expansion four-crank engines, made by Messrs. Wigham, Richardson & Co. All these engines are direct coupled to three-phase generators with stationary armatures and rotating magnets, made by the British Thomson-Houston Co. There is one 1,500 kilowatt turbo alternator by Messrs. C. A. Parsons & Co., running at 1,200 revolutions per minute. The alternator is direct coupled to the turbine, and is mounted on its own bearings; a forced circulation of oil and cooling water passes round each bearing. As a prime mover of electrical machinery the steam turbine approaches the ideal; it runs steadily, is free from vibration and needs little attention; the question of steam consumption has been the difficulty. In a communication made to this Institution last year the steam consumption per kilowatt-hour was given for a number of turbines; the figure steadily improved with the size of the machine. The Neptune Bank turbine bears comparison best with that supplied by Messrs. Parsons to Elberfeld, a machine of 1,000 kilowatts output. The figures of a test made at Neptune Bank are given, from which it will be seen that the Elberfeld results are beaten. With units of 3,000 to 6,000 kilowatts output, such as will be demanded in the near future, the turbine promises to outstrip all competitors.

The members visited the new pier works at the mouth of the river. The Tyne piers were commenced no less than forty-seven years ago, with the dual object of shielding the entrance to the Tyne from the rough sea and of scouring away the bar. They were constructed from designs originally prepared by Messrs. Walker, Burges & Cooper. With regard to the north pier, the straight portion—that is, the shoreward half—was constructed under a contract, the contractor being Mr. Benjamin Lawton. The outer half was carried out by the Tyne Commissioners' own staff, under the late Mr. P. J.

Messent, who had acted as resident engineer in connection with the first contract. The general design of the structure comprehends a mound of rubble stone carrying a superstructure of masonry. The latter consists of two longitudinal walls connected at frequent intervals by cross walls, the cavities or "pockets" thus formed being filled near the shoreward end with quarry débris, and further seaward with mass concrete. The depth of the foundations of the superstructure varies from low-water level at the shoreward end to 27 feet lower at the pier head. This depth of foundations at the pier head is much greater than was originally contemplated, it having been discovered while the work was in progress that wave action took place at much greater depth than had previously been supposed. The whole work stood well until the winter of 1893-94, after which it was found that some of the foreshore blocks had been moved and the foundations of a short length of pier exposed. In spite of every effort being made to effect repairs, in the year 1897 a breach was formed completely through the pier. This has extended until it was now 100 yards in width. Sir John Wolfe Barry K.C.B., and Messrs. Coode, Son & Matthews were asked to advise the Tyne Commissioners as to the wisest course to adopt, and, after careful deliberation, they decided that the remedy was to construct a length of new work under the protection of the breached structure. The new work is to be 1,500 feet in length, and is to join the outer end of the straight portion of the old work, forming with it a breakwater, straight from end to end, and of a length of over half a mile. In the new work the rubble mound is being dispensed with, and the foundations are being taken down to a hard shale, the depth averaging about 20 feet more than that of the original structure. Above the lower water level the section of the new work is identical with that of the old. The new length of pier is being made of Portland cement-concrete blocks banded from side to side of the pier, no mass work being used except above high-water level. The heaviest blocks weigh from 30 to 40 tons, and those exposed to the sea are faced with Aberdeen granite. The material overlying the new foundation is excavated by means of grabs, and as soon as the grab has worked down to the shale a diving bell is used to level the bed for the blocks. The diving bell now in use is 12 feet long by 9 feet wide by 6 feet high, and four men work in it at a time. The pressure which, of course, varies with the depth of water is about 20 lbs. on the square inch above that of the atmosphere, and up to the present there has been no case of sick-

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ness due to working under air-pressure. When the bed is prepared, the blocks are set by helmet divers, and great care is taken to get them level and true, as if they formed part of an architectural structure above water. The reason for commencing the work at some distance seaward of the junction was to admit of work being carried on at two faces, and thus extending seaward and shoreward simultaneously. As regarded temporary plant—the property of the contractors—attention was directed to the staging, the large Goliath cranes, the air-compressors for the diving bells, and to the plant designed for driving the staging piles. In the workyard the method of concrete mixing and of conveying the concrete when mixed to the block moulds was also noticed. The works are being carried out by the Tyne Commissioners themselves. The engineers are Sir J. Wolfe Barry, K.C.B., and Messrs. Coode, Son & Matthews, and the resident engineer is Mr. Ivan C. Barling. The contractors are Messrs. Sir John Jackson & Co. It is expected that the works will be completed about three years hence.

### LIGHTING OF PUBLIC STREETS.

THE following notes by Councillor Bruce Murray on the lighting of public streets have been entered on the Corporation minutes:—The darkness of Glasgow, especially in side streets, was the subject of much unfavourable comment by visitors to the city during the Exhibition. As mentioned by Mr. Wilson, manager of the Dawsholm gasworks, in a recent lecture, one of the engineers at the Gas Congress at Glasgow stated that the lighting of Glasgow streets was deplorable, and described the means employed as a "lot of rushlights and flickering bluebottles." In fact, notwithstanding the great advances that have been made in cities in England, and especially those abroad, Glasgow has hitherto been content with a few experiments in some main streets, using, as far as gas is concerned, old and out-of-date lanterns, quite unsuitable for the modern systems of lighting. Lately some improvement has been made in the latter respect, and new and, I believe, efficient lanterns are being manufactured and introduced, but although this is a move in the right direction, the rate of progress is very slow. The watching and lighting committee have always dealt with complaints promptly, so far as their restricted conditions, financially and otherwise, admitted, but have been hampered by the want of a definite policy as regards a system of lighting. This want

of a definite policy is also a cause of embarrassment to both the gas and electricity committee, and has led, I believe, to a certain amount of comparatively useless expenditure of capital. The Electricity Department has laid down mains for street lighting which are not yet utilised, and which, in view of the experience of other towns in incandescent and other systems of lighting, may never be utilised for this purpose, and the Electricity Department have made, or are making, provision for further extension. Money has also been spent in the introduction of incandescent lighting under conditions that, to say the least of it, do not insure the best results. The globe lamps employed generally are quite unsuitable; this form of lamp does not diffuse the light properly, and the method by which each lamp is fitted to the column is injurious to the life of the mantle, owing to the vibration of the pillars caused by wind and heavy traffic. The thickness of the glass in the globular lanterns also lessens the light, while the hole at the bottom exposes the mantle to injury by wind. The reports from other cities which I submit show that any attempt to use incandescent gas otherwise than in the most approved form of specially constructed lantern is doomed to failure. The quality of gas in Glasgow compares favourably with that in other cities, and when properly utilised the pressure is sufficient to produce the best results with incandescent mantles. But at present the natural pressure of the gas is not utilised, but, with a view to economy, is reduced by governors fitted to each lamp, and the quantity of gas used in side streets in ordinary lamps in Glasgow is less, in some cases to the extent of one-half, than the amount of gas that is allowed in other cities. The burners require at least 3 feet of gas per hour for the proper use of the mantles, but are restricted by false economy to, say, 2 feet to 2½ feet. In addition to having lanterns and mantles of the very best quality and design, special care and skilled attention are requisite to obtain the best results, and this important fact has not yet been sufficiently recognised in Glasgow. From private information there appears to be little doubt that Berlin is the best lighted city in Europe, and although there is a certain amount of electric light in use, that city is mainly illuminated by incandescent gas lamps. Paris is also a splendidly lit city, and the Rue de la Paix is admitted to be the best-lighted street in Europe. The illumination of this street is effected by incandescent gas, which, notwithstanding the high price of gas—6s. 9d. per 1,000 cubic feet—I understand works out at much less than the cost of electric light, and I am informed on good authority that the municipi-

<p><b>COUNTRY HOUSES</b></p> <p>LIGHTED BY</p> <p><b>ELECTRICITY</b></p> <p>GENERATED BY</p> <p><b>STEAM</b></p> <p><b>GAS</b></p> <p><b>OIL</b></p> <p><b>OR</b></p> <p><b>WATER POWER</b></p>	<p>— WORKS: —</p> <p><b>48, Osnaburgh Street,</b></p> <p>REGENT'S PARK,</p> <p><b>LONDON, N.W.</b></p> <p>Telegrams: "STRODES LONDON."</p> <p><b>STRODE &amp; Co.</b></p>   <p><b>WEST END SHOW ROOMS:</b></p> <p><b>188, PICCADILLY.</b></p> <p><b>CITY SHOW ROOMS:</b></p> <p><b>67, ST. PAUL'S CHURCHYARD.</b></p>	<p><b>DESIGNERS</b></p> <p>AND</p> <p><b>MANUFACTURERS</b></p> <p>OF</p> <p><b>Artistic</b></p> <p><b>Fittings</b></p> <p>IN THE</p> <p><b>ELIZABETHAN,</b></p> <p><b>GOTHIC,</b></p> <p><b>ITALIAN,</b></p> <p>AND</p> <p><b>LOUIS XVI.</b></p> <p><b>STYLES.</b></p> <p><b>Special Designs</b></p> <p><b>Free on Application.</b></p> <p><b>LIBERAL TERMS</b></p> <p><b>TO THE TRADE.</b></p>
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pality of Paris has decided not to extend further its system of electric lighting. The lighting of Vienna and most other continental towns is greatly in advance of anything we can pretend to in this country. But for the purpose of comparison we need not go so far afield. Directing our attention, in the first instance, to one of the nearest neighbouring cities of similar size to our own—viz. Liverpool—which I know from personal observation is much better lit than our own city, I find that about five or six years ago the whole question of the lighting of that city was taken in hand by a committee like our own, and after careful inquiry and numerous experiments it was finally decided in 1898 to rearrange the whole system of lighting, and apply incandescent gas to all the streets, the change to be carried out in four years. The conversion, however, was practically effected in three years, with the result that the illuminating power of lamps throughout the city was increased before midnight from 466 million candles to 1,576 million candles, or nearly four times, while after midnight the illuminating power was increased from 324 to 685 million candles, or more than double. It is important to note that, notwithstanding this great increase in illuminating power, the total cost for lighting, which was 40,889*l.* in 1893, amounted in 1901 to 39,587*l.* or a reduction of 1,302*l.* There were special circumstances connected with Liverpool, such as the reduction of 10 per cent. in the charge for gas for street lighting, which the gas company were compelled to give under arbitration, and some other minor matters, but the result clearly shows that the lighting of a city can be greatly increased by means of incandescent gas with practically little or no additional cost. Mr. Murray refers to incandescent lighting in Newcastle, Cardiff, &c., and goes on to say:—I think one of the first duties of the committee should be to inquire most particularly into the relative cost of electricity and incandescent gas. The adoption of electric lighting, from such information as I can obtain, has already added considerably to the cost of lighting the city, and in this connection I would refer to the recent resolution, approved by the Corporation, to fit 228 additional electric lamps. The annual charge for electricity, at 14*l.* for each lamp, amounts to 3,192*l.*, with, I understand, a capital expenditure of 7,200*l.* Taking 6 per cent. to cover interest and depreciation, this adds 430*l.* per annum to the cost, making 3,622*l.* The number of ordinary gas lamps that will be displaced is 589, and the cost of lighting at present only amounts to between 1,200*l.* and 1,300*l.*, so that the watching and lighting committee have recommended an

increased expenditure of about 2,400*l.* on the area covered by these 228 electric lamps. Our inspector of lighting estimates that the value of incandescent against flat flame may be taken as four times greater in favour of incandescent, from which it would appear that, with the same consumption of gas, greatly increased illumination could be obtained, with only the additional cost entailed by the capital expenditure on fitting, upkeep, mantles, &c. What I think is a very liberal estimate for supplying incandescent gas on the most improved system to the same district, including labour, &c., has been given to me by our inspector of lighting, viz. 2,000*l.* This appears a good deal higher than the other figures in statistics before us; but, accepting it as correct, it would show that, allowing for interest on a capital expenditure of 2,000*l.* for new lanterns, &c., the annual charge for incandescent gas would be 2,120*l.*, as against cost of electric light, 3,622*l.*—a difference of 1,500*l.* on this one district alone. At a meeting of the sub-committee on public lighting, held on May 7, it was agreed to recommend that "before recommending any definite system, it be remitted to the inspector of lighting, the gas engineer and the electrical engineer to have two streets in the city fitted up with the most approved systems of incandescent gas and the Nernst electric incandescent light system respectively, and that the Corporation recommend the gas and electricity committees to authorise the officials of those departments to carry out the necessary experiments, and, with a view to this sub-committee making a comparison of the respective systems, they be authorised to visit, if necessary, other towns, for the purpose of inspecting and reporting on the lighting of the public streets thereof."

#### UNIFORMITY IN SPECIFICATIONS FOR CEMENT AND METHODS OF TESTING.\*

THE attainment of a standard specification is greatly desired by all those called upon to use cement in works of construction; indeed, this matter is of such importance to the manufacturer and consumer that both are concentrating their efforts in endeavouring to accomplish this result.

Mr. Lesley has given us much interesting information in regard to the great variations at the present time in specifica-

\* A paper read before the American Section of the International Association for Testing Materials by Mr. George S. Webster, and published in the *Engineering Record*.

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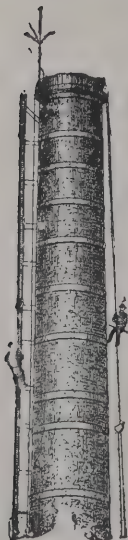
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ions for cement, these variations not only arising from differences of opinion between experts as to what constitutes good material, and from different methods of testing, but also arising in many instances from lack of knowledge or from inexperience. Some of the specifications call for high strength, others for low; some require quick and others slow setting; many require a finely ground product to be slow setting and to be low in sulphuric acid, which is difficult and often impossible to produce; others introduce chemical qualifications which, if not submitted to an expert for approval, often impose very unnecessary restrictions on the manufacturer.

The difficulties under which the manufacturer labours are therefore evident. His material must satisfy all of the specifications of his different contracts, and a single product can scarcely be controlled by subsequent treatment to meet these different requirements; also he is sometimes asked to meet impracticable conditions. The advantages of a uniform specification to a manufacturer would therefore be great. Instead of being obliged to meet irrational and sometimes impossible specifications requiring a great variety of grades of material, he would be required to produce only one, or possibly two, grades, one quick and one slow setting. His work would be greatly simplified, which would not only reduce the probability of producing inferior material, but also tend to reduce the cost of production.

The advantages of uniformity in specifications, moreover, are by no means entirely in favour of the manufacturer. The material supplied under a uniform specification would necessarily result in a production having more uniform properties and qualities. This material would be ground to a certain fineness, have a definite specific gravity, and develop a strength with less range of variation when treated under definite conditions. Thus the consumer could depend upon the quality of his material better than he does now, and would consequently be able to use it more understandingly, by adopting more efficient methods of manipulation and more economical designs. He would also be able to establish the fact when failures in mortar and concrete occur from poor workmanship and improper manipulation of the materials rather than from the inferior quality of the cement, and he would apply such remedies as would secure more durable and permanent structures. The investigation of cement in any one branch of construction would have a definite bearing on all cement construction and could be utilised in every line, whereas now they excite interest only in a general way.

Again, the consumer would not only save money through economies in manipulation and design, but his material would actually cost less, due to the reduction in cost to the manufacturer, resulting from the production of a standard article. The small consumer, also, not having sufficient appliances for accurate testing, would be more sure of the character of his material. Under the present system he is liable to get all the inferior products of the mill and the shipments which have been condemned on more important work, whereas if only a standard grade of material were produced he would be more likely to secure a normal product.

Every one connected with a laboratory for testing cement knows the great influence which details of seemingly minor importance exert upon the results. In the preceding part of this paper it has been assumed that uniformity in specifications is equivalent to uniformity in the material itself, but this evidently would not be the case unless the specifications were based upon a standard method of testing. For instance, one laboratory might obtain a certain value on a seven-day sand test, and another might obtain a much greater value on exactly the same material. Therefore if the uniform specification called for a value intermediate between the two, the first laboratory would require a higher testing cement than the second, even should their requirements be identical. In order for a uniform specification, therefore, to have any practical value, it must be based on a standard method of testing.

The principal reason that tests of cement show such variations in the results obtained by different operators, is that it is one of the few materials that is not tested entirely in the form in which it is manufactured and sold. Bars of iron and steel, bricks and wood, are tested not only in the form in which they are to be used, but also in the form in which they are produced and sold. Cement, on the contrary, is made in one form, tested in a second and used in a third form.

The tests of cement may be divided into two classes:— First, those which can be made with comparative accuracy, and second, those which are only relative owing to the great influence which the personal equation has upon the results.

The first class of tests are those made on the material as it is manufactured and sold, i.e. specific gravity, fineness and chemical analysis. The second class includes those tests which are made on the material after it has been subjected to certain processes and combined with other elements, and hence exists in a different form from that in which it was pro-

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duced, *i.e.* time of setting, tensile and compressive strength and soundness.

The first class of tests are capable of standardisation, providing the apparatus and materials used are made and handled with precision. The second class, on the other hand, are subject not only to variations in the material itself, but also to variations in the other elements used with this material and to variations in the processes employed in combining them.

On account of the difficulty of procuring suitable apparatus for making tests and of manipulating it with exactness, variations will be found to some extent to affect all tests.

The determination of specific gravity is probably least subject to variations due to differences in method, where reasonable care is exercised in its manipulation.

The test of fineness, on the other hand, is subject to variations on account of the difficulty of procuring standard sieves and of manipulating them with precision.

Chemical analyses are also subject to similar irregularities. In the tests made on pastes of cement, the inaccuracies of manipulation enter with double force, on account of the introduction of other elements and of the greater influence of the personal equation.

On account of these many possible sources of error, therefore, it is evident that every detail of manipulation and every piece of apparatus used must be prescribed exactly, thus standardising the methods of testing if it is desired to adopt a uniform specification.

This, however, would not be the only advantage gained by the introduction of uniformity in methods. Even if there were no thought of adopting a standard specification, a standard method of testing would still be decidedly beneficial, in that it would place all results obtained on any material, in any place, on exactly the same basis. Under the present system the results of tests in one laboratory are of little practical value to another. If, however, these results all had the same basis they would have a direct bearing on, and be strictly comparable with, the results obtained elsewhere, which would vastly increase our knowledge of the behaviour of the material, and also render unnecessary a great amount of duplication of investigations.

For instance, a laboratory might make an apparently exhaustive series of tests investigating some property of cement. These tests might be repeated by a second laboratory, using different methods and probably obtaining results seemingly contradictory, thus leaving every one confused as

to the indications of the tests, whereas if standard methods had been used the results would be much more likely to have been corroborative.

Standardisation of methods, therefore, would have the great advantage of placing on a common basis all results either of routine work or of experimental investigations.

Another benefit also would be the doing away with the constant source of friction between manufacturer and consumer in regard to the results of tests. The manufacturer's laboratory may use a method giving high results, and the consumer's laboratory may yield lower values; both, however, being accurate as regards their respective method. The manufacturer, not always realising that the consumer's specifications are based on the results of his own laboratory, and not of the manufacturer's, is constantly endeavouring to show that the failure to meet the requirements is due to the consumer's methods. This is a comparatively unimportant matter, but it helps to show the many annoyances that could be obviated by standardisation.

The American Society of Civil Engineers, through the report of its committee in 1885, was among the first to inaugurate a set of rules for the uniform testing of cement. While these rules served their purpose in an excellent manner for a number of years, they fail to entirely meet the requirements of to-day. This has resulted from several causes, among which may be mentioned, first, improved methods of manufacture; second, increase in knowledge of testing and better acquaintance with the properties of cement; third, the demand for greater accuracy and the more rigorous requirements in specifications; fourth, the increasing importance and magnitude of the works of construction in which cement is used as the principal material.

In recognition of these facts, the Society has recently appointed a committee to report methods for the uniform tests of cement. In carrying out these instructions the committee is confronted with the difficulties attending the selection of standard methods by which uniform and comparable results may be obtained. Anyone engaged in the testing of cements must necessarily encounter the same difficulties and must realise that the basis of a standard specification is a system of testing which will give uniformity in results. This fact cannot be too strongly emphasised. It would therefore appear logical that the first efforts should be directed towards securing uniformity in methods of testing, then the formulation of a uniform specification would naturally follow.

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# The Architect.

## THE WEEK.

THE Portsmouth Town Council on Tuesday decided by a large majority that an eminent engineer should be requested to advise them as to the most economical method of remedying the flooding of Southsea. This sudden resolve is owing to the action of the Local Government Board. The Council applied for authority to borrow £8,200 for the construction of a new high-level relief sewer. But the Board declined to sanction this loan until the Council gave an undertaking that it would submit a proper scheme for dealing with the sewage and storm water from the low lying area at Southsea, and would expeditiously proceed with the work. The inconvenience caused by flooding is said to occur not more than a few times every year; it will be necessary to expend from £80,000 to £100,000 in order to put a stop to the flooding. The Government have a great interest in the various towns which constitute Portsmouth, and although the action of refusing permission to borrow may be judged despotic, it is sensible that in no other way could the Town Council be compelled to deal with the problem. The borough engineer prepared a scheme which could be carried out at a cost of about £25,000, but it has not been approved by the officials who are connected with the town.

THE Joint Select Committee of the Houses of Lords and Commons have recommended clauses in measures for housing of the working classes which will impose additional responsibility on the Home Secretary. The Council or company desiring to acquire land will have to submit a description and plan with other particulars to the Secretary of State. He will determine the number of persons for whom a housing obligation has arisen, and a certificate to that effect will be issued. The buildings will be subject to the provisions of the London Building Act. Inspectors are to be appointed for the purposes of making inquiries that will be necessary, and the expenses incurred, including those of witnesses summoned, and a reasonable sum for the services of the inspector, will have to be borne by the Council or company. In places outside London similar inquiries will be held. There is often doubt about the persons called the labouring class for whom the dwellings are to be erected. It is to include mechanics, artisans, labourers and others working for wages, day-labourers, costermongers, persons not working for wages but engaged at some trade or handicraft without employing others except members of their own family, and persons other than domestic servants whose income does not exceed an average of 30s. a week, and the families of any persons who may be residing with them.

IN 1895 M. CHALLEMEL-LACOUR, the president of the Senate, expressed the desire that a series of eight tapestries might be produced at the Gobelins for the decoration of the Luxembourg Palace. It was stipulated that political subjects were to be avoided. After consideration it was decided that the pieces should be derived from the "Metamorphoses" of OVID. The poet is much admired by French students of literature. But artists have not drawn inspiration from him, for in presenting mythological subjects Greek authors have been preferred. There is on that account some novelty in the selection of the poet to afford subjects for decorative tapestries. The first commission was given to M. ALBERT BESNARD. The legend he chose was DAPHNE pursued by APOLLO and changed into a laurel tree. The work has been satisfactorily executed at the Gobelins. M. MAIGNAN will continue the series, which it is expected will occupy him about four years. He is at present engaged on two tapestries, viz. *Jupiter and Semele* and *Venus and*

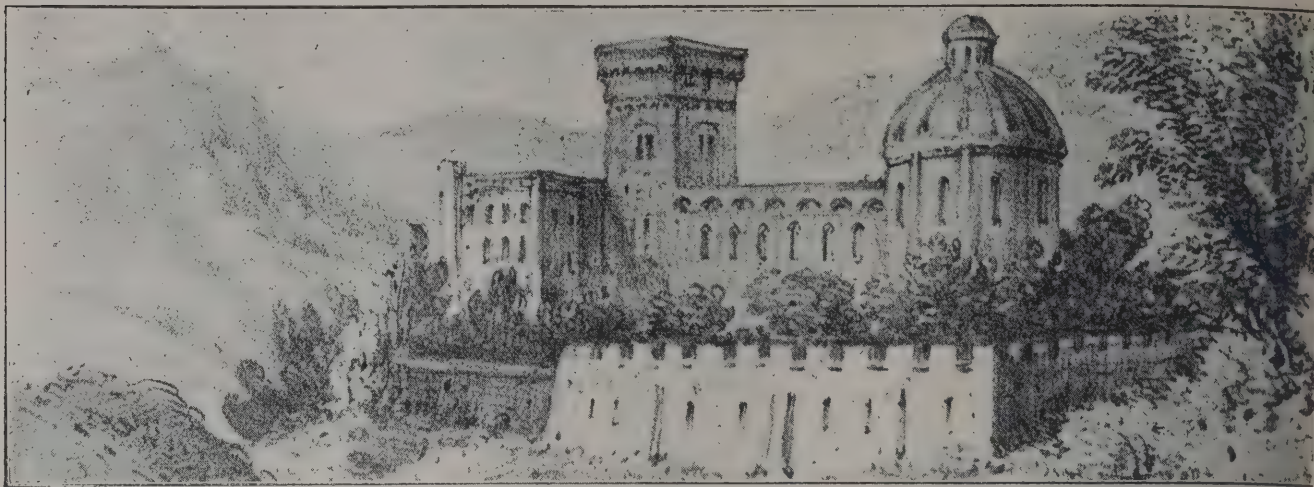
City Council of Philadelphia displayed an amount of sacrifice which is unusual among American municipal corporations when they confided the preparation of the con-

ditions of the competition for the monument to the soldiers, sailors and marines who fought in the war for the suppression of the rebellion to the T-Square Club and Philadelphia Chapter of the American Institute of Architects. Although about 700 applications were made for a copy of the conditions, there were no more than sixty-two plans received. The two societies elected Mr. HOWARD WALKER, of Boston, and Mr. J. M. CARRERE, of New York, as representatives, and they in turn appointed Mr. CHARLES GRAFELY, of Philadelphia. The jury testified to the excellence of the designs, and considered that any of the five selected could be executed within the nominated amount of 500,000 dols. The prizes were awarded as follows:—(1) 1,000 dols., Messrs. LORD & HEWLETT; (2) 600 dols., Mr. C. F. ROSBORG; (3) 400 dols., Mr. W. L. COTTRELL; (4) 300 dols., Messrs. ACKERMAN & ROSS; (5) 200 dols., Messrs. CARY & LYLE. The winners of the fifth prize belong to Buffalo, and all the others to New York City.

ENGLISH visitors are so much fascinated by the legend of ROMEO and JULIET when they visit Verona, they do not bestow sufficient attention on the most interesting churches and other remains of antiquity. There are parts of San Zeno which date from the ninth century, for the church is one of the few in Italy which escaped renovation by the masons from Como. The bronze doors are remarkable. The "wheel of Fortune," which was executed by BRISLOTTO in the eleventh century, although converted into a window, still is suggestive of its original condition. Embodied in the walls are fragments of ancient work. But neither age nor beauty can preserve San Zeno from defacement by the youth of Verona. A recent visitor says that the beautiful façade is being perforated as if it had sustained an attack by cannon-balls. The holes are due to youngsters who enjoy the odour which is emitted when the marble is struck by hard stone. One of the sacristans remonstrated with the juvenile vandals, and received in return a stab with a knife. As for the civic authorities, they seem to be afraid to interfere. Liberty of the same kind is exercised in other places besides Verona. The city has, unfortunately, a provision for attacks on marble. In the environs a stone is found which is called bronzine, because under the hands of the masons it sounds like a piece of metal. It is extremely hard, and as San Zeno exemplifies, marble cannot resist blows from it.

IN the last number of *L'Art* M. SIMON GUY offers some comments on the Museum of Decorative Art, to which the Pavillon Marsan of the Louvre is now appropriated. When the Union Centrale des Arts Décoratifs proposed the establishment of a museum in Paris we suggested that its position should not be on the Quai d'Orsay or in the neighbourhood of the Champs-Élysées, but somewhere in the east of Paris, where the furniture-makers, the metalworkers, &c., could easily have access to the collections. The Union seemed to think more of its own social position than of aiding the manufacturers of Paris, and after a long course of diplomacy was able to secure a part of the Louvre. That, no doubt, is a victory for the Union, and we expect the Pavillon Marsan will contain the objects for many a year. M. GUY recognises the state of the case. It is too late to have the change to a site which should have been selected in the first instance. What he advocates is the organising of "musées roulante," resembling the loan collections of the Board of Education, and which are known throughout England and Scotland. The Pavillon Marsan would be the treasury from which the collections would be derived in order to be sent to parts of Paris or provincial cities where they would be most useful. The cultivation of provincial workmen is essential. The authorities are enamoured of centralisation, and it somehow is in unison with the French mind. As soon as a student shows a little proficiency in drawing or modelling, sacrifices are made by himself and his family to enable him to reach the capital, where it is anticipated his abilities can be developed. M. GUY says his suggestions relate to an ideal organisation; but they are ideal not through any inapplicability to business, but solely because circumstances combine to give Paris a monopolising power, which, on many occasions has been found dangerous to France.





PAINTERS' ARCHITECTURE: DOMENICHINO.

### THE FUTURE OF ARCHITECTURE.

THERE are two ways of treating the history of architecture. It can be considered either comprehensively or in detail. Thus we may have the buildings of Western Asia or of Eastern Asia in one group, or under the former treat of the buildings of Assyria, Babylon, Phoenicia, the Israelites, the Medes and Persians, Phrygia, Lycia, &c. Eastern architecture can be taken as Indian, with outlying works having more or less relation to the general style, such as those in Cabul, Ceylon, Nepal, Java and China. A similar course may be followed in other regions. We have an example of the method by FRANZ KUGLER, who, however, treated all varieties of art simply as "Denkmäler" or memorials. Comprehensive views have, however, their drawbacks. They resemble the maps of the hemispheres, or those of Europe, Asia, Africa and America, which have to form part of an atlas, but which are less often referred to than maps of particular countries. KUGLER'S descriptions of Indian buildings seem very vague if they are compared with those of FERGUSSON in his volume on Indian architecture. The latter, moreover, cannot be considered as doing justice to remains when contrasted with the descriptions which are met with in the volumes of the "Archæological Survey of India."

It was perceived that in architecture there are so many varieties of work, the qualities were not demonstrated by classifying the examples in a few groups. Norman, Early English, Decorated and Perpendicular were quickly discovered to be inadequate as designations, and it was necessary to introduce intermediate or transition periods. It was even proposed that as the differences of Gothic were sufficiently marked they should be distinguished by the names of the sovereigns who then reigned. It was also realised that place was as important as time. Both in France and England evidence of the existence of schools having local peculiarities was forthcoming. Indeed, of late years classification by schools has apparently in France superseded the divisions of Romanesque, Transition, Primordial Gothic, Secondary Gothic and Tertiary Gothic.

With Greek architecture the ancient divisions of Doric and Ionic are too general, for there are modifications of the orders which have their importance. The Greeks acted on tradition in architecture as in sculpture. But some liberty was allowed and it was gladly utilised. The laws which were accepted in Athens were not thought to be binding in the colonies. Roman architecture was less formal or faithful to precedent than the Greek. Temporary conditions were permitted to exercise their influence. But the Romans were subjected to a temptation which was not favourable to varieties of treatment. Their power was felt in many lands, and policy dictated that the forms which were familiar in the capital should be imitated in provincial towns. There was, in fact, an official style which demanded respect. Instead therefore of objecting to the monotony of the buildings throughout Europe when it was under Roman sway, we should be gratified at the amount of diversity which was tolerated. The adoption of the

basilican plan in the Early Christian churches might also be presumed to favour repetitions in architecture wherever the religion was observed. But Byzantine and other influences came into operation, and we find that in Gaul, to take one country, Roman models were discarded in favour of the vaulted buildings which are usually known as Romanesque.

As regards Gothic it seemed to be probable the uniformity would be again manifested in all quarters of Europe. The monks, who for a long period were the sole architects, constituted a body of men who by their position were citizens of the world rather than inhabitants of particular countries. But somehow variety gained the upper hand, and in consequence we have French, German, English, Italian and Spanish Gothic, each with recognised peculiarities.

From these examples it would not be unreasonable to conclude that, in spite of all obstacles, individuality is sure to continue to assert itself in architecture, and that in future times it may in consequence be expected that a much difference among buildings will be shown as was seen in the past. That, however, is not the impression which was made on the mind of M. PASCAL, the French architect by the designs which he had to examine in the International Exhibition of 1900. In the exhibition buildings which each country constructed for the display of its own products he saw an endeavour to indicate forms which would be typical and national in every case, but the designs contributed for modern work did not in style correspond with the temporary structures. He could not resist the inference that in 1900 there was a tendency to a cosmopolitan architecture, and that even in what is called L'Art Nouveau marvellous resemblance existed between the experiments made in Belgium, Austria, France and England.

It is needless to remark the phenomenon was gratifying to M. PASCAL. As a member of the Institut de France he is better acquainted with the extent of the study which every French architect must go through. Is not too much time misspent when the outcome of it is only the production of a building with all the characteristics of a period that is separated from us by no more than a century? The most important of all the buildings of the exhibition was a work of that class. France, therefore, initiated the architecture of the century with copying instead of endeavouring to invent. The same spirit was observable in the works of other countries. It was complimentary to Frenchmen to see so much which was inspired by them, and it suggested that, although the Roman Empire had vanished, there was still an Imperial power which dictated the character of the architecture in parts of the globe which were unknown to all the CÆSARS.

M. PASCAL ascribes the similarity to such causes as the spread of democracy, the facilities for travelling, the distribution of wealth, the freedom of exchange, and the large scale on which enterprises are carried out. It was once said that the Pyrenees no longer existed, and as far as it is concerned, the boundaries of States cannot be said to



have a material existence, for whatever is found pleasing in one country is soon imitated or copied elsewhere. It would perhaps be more concise to state that the system of trusts has found its way into the arts, and especially into building. Countless businesses are consolidated and come under the control of one or a few directors. Wholesale production has become a necessity. Nothing more fatal to variety can be discovered. Look, for instance, at the tall buildings which may be counted as an American invention. In appearance they are colossal examples of monotony. The differences between them in an architectural sense are insignificant. It is no wonder that efforts have been made to combine them as one property, and it would no doubt be more economical if a single set of plans were followed for the structures which are to be erected.

In England we notice the operation of the same spirit, though on a less developed scale. In London, as well as in provincial towns, we see innumerable ranges of offices without occupants, and yet there is a desire for the erection of immense buildings like those in America. English enterprise has not yet acquired the courage which is necessary for the undertaking, but we have examples enough of long stretches of buildings which are repetitions of one design. Building companies and speculative firms find that profit is promoted by the arrangement, and art is bound to succumb to the greed for gain. The advantages of machinery are most evident in the production of work which can be measured by the mile, and which in proportion to the quantity can be turned out at a cheaper rate.

M. PASCAL has hopes that under the new conditions art may obtain a larger field for its display. The similarity of products may have effects on men which we cannot anticipate. In the creation of dress, food, literature, arms and other things mechanical repetition has long been supreme. By the aid of machinery the kinship between men has been established. It may be a blessing when the buses in long leagues of streets are indistinguishable except by their numbers. But a new theory of art will have to be evolved to deal with the novel conditions.

It is always possible to realise the inevitableness of a law of reaction in all things which concern men. There are people who, for a time at least, experience some repose in sameness. It is even considered philosophic when one in disregard the variety which nature presents, and like Mr. JOHNSON, believe that all green fields are alike. Few are now found to agree with the Fleet Street sage, and his saying seems to have led to more appreciation of the diversity which nature presents in our island. A like experience may be anticipated in architecture. As HEINE wrote, men must be always either Greeks or barbarians, and it may be assumed that the former will not find enjoyment in monotony for long, and the spirit to which we owe architecture that is worthy of the name will not always be content with the adoption of packing-case models for the buildings in which they live and work.

### OLD ENGLISH FURNITURE.\*

IN examining old English manufactures, whether in a museum, exhibition, or private collection, we are compelled to recognise the substantial character of the work and the carefulness of the owners. In furniture especially, which usually consists of several parts, the existence of ancient examples depends on the quality of the materials and the skill with which the parts have been combined. If that skill would often be insufficient to resist the power of time and the tendency of all things to decay if it were not for the reverence which people have for what is venerable. The importance of the latter factor is sometimes remarkable. In houses which have been occupied by the same family during many generations it is easy to understand why old furniture should always be carefully preserved. There are associations connected with examples which are sufficient to impart interest to them in the eyes of successive members of the family. They are also, as it were, title-deeds which afford evidence of former and con-

tinuous respectability. The large sums which are given for a variety of old curios at the present time, in the hope that they may be accepted by visitors as survivals of the possessions of the owner's family, are enough to suggest the value which must belong to examples which are genuine heirlooms.

If, however, we judge pieces of furniture by their intrinsic merit as beautiful objects, they cannot be considered so praiseworthy as they appear when regarded simply as relics of the past. For a long time there were restrictions on the exercise of imagination by furniture-makers. Indeed, it would not be difficult to uphold the theory that the English craftsmen were deprived of imaginative powers. They contented themselves with the repetition or adaptation of very few models, and their ornament is as wanting in variety as if the manifold forms of nature dare not be followed without incurring a penalty. The fancy which was found in all classes of contemporary literature is rarely met with in any branch of craftsmen's work. This is the more remarkable when we know that foreign artists were welcome in England, and that native artists might reasonably be incited to equal, if not to surpass their productions.

The shortcomings of old work ought never to be passed over. In the case of furniture there is always the risk that age alone will be looked on as sufficient to condone defects in design. We should never forget that many of the English woodworkers were mechanical in their operations, and that, like workmen of the present day, they were not proud of their business, and performed it in whatever way brought least trouble to them. We must admit that the work was throughout executed by hand, and that the only machine employed was the turner's lathe.

In our time, when so much can be effected by the aid of machinery, it is no doubt allowable to prize what was done by the hand with the assistance of a few tools. But we need not, in order to do justice to unknown workmen, exalt their productions into things of beauty which it is the duty of the world to preserve. "For ingenuity and quaintness of design," says Mr. HURRELL in the preface to his book on old English furniture, "richness of moulding or profusion of ornament, the old oak furniture of England and the internal woodwork and plasterwork of our old English mansions of the seventeenth and eighteenth centuries are probably unsurpassed by the contemporaneous work of any other country, while the numerous smaller country houses still left to us are full of most interesting detail of a more simple kind, but possessing the same originality and quaintness of spirit." A comparison between English and foreign work would be a colossal task, and may therefore be set aside. Originality and quaintness of spirit may be granted, but the test of tests is the presence of beauty, and the critic must be exceedingly tolerant who will admit that it is a general characteristic of old oak English furniture. While, therefore, we can understand that a collection of examples of such furniture may be of much interest to the antiquary, we must hesitate in agreeing with Mr. HURRELL that it is adapted "for reference to the architect, designer and craftsman whose business it is to produce similar work in modern times." If designing means the continuous repetition of subjects, regardless of their quality or their applicability, then copies to follow can hardly be too numerous. But if designing means creation and the invention of novelty, aids and suggestions of another kind are desirable.

We willingly acknowledge the care which has been taken by Mr. HURRELL in preparing a series of plates which from the abundance of detail will enable any ordinary cabinet-maker to produce cabinets, wardrobes, dressers, drawers, chests, presses, tables, chairs, &c., which will correspond with the ancient examples delineated. That is a kind of work for which there is at present a continual demand. But in criticising the examples we think it preferable to look on them as curiosities, or as things which should express local and temporary peculiarities rather than as forms which must be gratifying for all time.

As often happens with English work, the weakness of the different pieces of furniture represented is most strongly expressed in the parts that are supposed to be decorative. Oak is by no means easy to carve, especially when the forms introduced have to be curved. There is some excuse therefore when the lines are portions of circles, for

\* Measured Drawings of Old Oak English Furniture; also some remains of architectural woodwork, plasterwork, metalwork, glazing, &c. By John Weymouth Hurrell. (London: B. T. Batsford.)



they could be struck out without much difficulty. But the designers were not satisfied with semicircles and segments. They often attempted curves which are only partially circular, and the more elaborate the ornament the less pleasing it becomes. In instances where the craftsmen were content with using right lines, with or without right angles, the pieces appear to be dignified if compared with their more ambitious companions. The strapwork is also fairly successful although it leads to an excess of repetition. The lathe-work does not present many extravagances, but what is required in our time is quaint ornament, and although that is the least happy part of the furniture reproduced it is likely to be most generally admired. A large number of examples are derived from Little Moreton Hall, Cheshire. A corbel employed under oak ceiling beams is curious for the treatment of an acanthus leaf on the face, the numerous repetitions not having the slightest variation. It is worth comparing all the ornamental work in the interior with the entrance-gates between the moathouse and the courtyard, which are expressive of strength and yet are pleasing from the excellent moulded work which is shown. The wall-panelling in the same mansion is also in good style, and the woodwork of the building, unlike the furniture, gives the impression of the control of an architect. The panelling from Plas Mawr, Conway, is suggestive of heraldry, but the figures are arranged in a way that would astonish a herald. A quaint ceiling is shown from a house in Leek, in which branches are presented in such a manner as to amaze all who believe in the connection between vegetation and curves. In it the branches are all straight lines and the main stem is in each panel surmounted by a ram's head. Chetham's College, Manchester, possesses a very elaborate perforated staircase which the joiners must have rejoiced in. But for style it will not bear comparison with one in Prince's Tavern, John Dalton Street. Some illustrations of metalwork and glazing are also included.

One hundred and ten plates constitute the volume, and they all appear to be faithful records of old work. There is no attempt to extenuate any of the defects of the details. It is strange that nothing can be seen which is to be taken as a local style. The English love of precedent was exhibited as markedly in the joiners' workshops as in assize courts. Evidently certain patterns were in circulation and were followed as exactly as if they embodied established canons of art. It would be better if many of those things could be treated as obsolete, but the world, or at least the English race, will not allow of that course, and we presume for many a year the strange plant forms, wreaths, spirals, crescents, &c., will be favoured. In fact, they have gained a new lease of life from Mr. HURRELL's plates. As a trade auxiliary the volume must be considered as profitable, for it is possible to produce many sorts of old English antique furniture by the aid of the drawings, and they will have that genuine character which the modern amateur is supposed to be able to recognise and to enjoy. Architects and designers will, however, prefer to use the plates as a basis for creations which, although suggestive of an ancient spirit, will avoid the display of any of the weakness which in those days was the result of an imperfect knowledge of ornamental forms.

### COUTURE AND DUTUIT.

FEW modern paintings excited more interest than *The Decadence of the Romans*, by Thomas Couture. He was a morose artist, who lived in seclusion and brooded over his failures. He was out of harmony with his time, and it was really Imperial Paris which he satirised under the figures of ancient Romans. It is remarkable, however, that several able artists found their way to his studio. The despotism of the painter had the effect of making them indignant against his practice and the principles on which it was based. It is also curious that M. Dutuit, who has bequeathed to the Municipal Council of Paris a most valuable collection of paintings, and who was always a wealthy amateur, did not disdain serving the painter as a rapin or pupil-servant. The incident is related by Couture in his "Méthode et Entretien d'Atelier." We give a translation of the passage:—

About 1842 I occupied a modest atelier in the Passage du Bois-de-Boulogne. The year before I exhibited a picture of a young Venetian after an orgy. It was noticed and purchased. Thereupon I abandoned competitions and sought the support of the public. From my début it was benevolent towards me.

One day someone knocked timidly at my door and on bidding him enter I saw a singular person. His clothes were badly made, his shoes were large and heavy, and his trousers being too short allowed his blue stockings to be visible; in fact, he seemed to be clad in blue, and under his arm he carried one of those big umbrellas seen in the country and which was also of blue stuff. He hesitated about entering the atelier, his face was pale and troubled, and he appeared to be a mixture of a sacristan and mendicant. He told me in a trembling voice that he would be happy to receive my instructions, and came to inquire whether I would take him for a disciple. I was ambitious, and in this case thought I would have more embarrassment than profit, so I brutally refused. He appeared very sorry for his intrusion and bent his head as if he were a culprit. I was moved by his extreme modesty and asked him would he care to be my rapin. That, he said, would be his greatest happiness, and I told him to make arrangements accordingly.

He came back with an easel of white wood, a small box, a couple of stools and a mattress. I instructed him about keeping the atelier in order. As a rule the services are only rendered by young boys, and are never sought from a man, but the visitor was so humble he could be requested to do everything. Never was the atelier so well kept, the palettes were always clean and shining. He carefully watched me, and if I dropped a pencil picked it up and presented it to me with an old-fashioned bow. When the day was over he attended me to my lodging, and on leaving renewed his salutation. After some days he told me that I had said nothing about the fee he was to pay, and asked if seventy-five francs a month would be accepted. I explained to him that the best men were only paid twenty-five francs, and as he rendered me such good service I did not need any fees. He replied that in those ateliers there were a crowd of students who might never have the advantage of working with the master. As he insisted, I told him to give me the seventy-five francs, if the payment caused him no inconvenience, and to say no more on the subject. But he contrived to make a little packet of the money at the end of each month which I was sure to find in seeking for something else. Sometimes he wanted me to spend the evening with him and I refused. But once I accepted the invitation. We went to a good restaurant and were well served. I became alarmed about the expense for his sake, but he said he knew the owner, who was grateful for some little services he had done to him. We often went to auction-rooms, and I found he was skilful in the judging of old works. Once he said that a work by Hobbema, which we had admired, was sold for 37,000 francs. I replied they were happy who were able to acquire such masterpieces. This appeared to give him pleasure.

He was not without intelligence and never neglected his service. It was impossible to tell his age—whether he was twenty-eight or sixty. He was bent like an old man, but was interested in him and pitied him. We remained eighteen months together. A new rapin had arrived, and the old one had become my friend. One day he came to me in son excitement and announced that he was compelled to leave the evening, and would perhaps be absent for a couple of months. The next day a woman, who was a model, entered and told me that my student was a millionaire, and that he had gone in pursuit of a debtor who owed him 1,500,000 francs. I was surprised, for I supposed from what he said that he possessed not more than from four to five thousand francs of income. As he did not return, I imagined he had lost everything.

Long afterwards in going to Havre I passed by Rouen, city of which my friend had often spoken. I inquired of him, but was informed the only one of the name was the richest man in the country. However, I went to the hotel indicated as his residence and asked to see the master. I saw an old gentleman who bore some resemblance to my friend. I asked him if he had a son who was occupied with painting. In replying he told me who I was and said my visit was providential, for his son had only arrived the day before from Italy. When my ex-pupil appeared there was little change in his appearance. He conducted me to his room, which, he said, no stranger was allowed to visit. I was amazed at the number of marvellous masterpieces, and among them were several which I had looked at with him in auction-rooms. I questioned him if he was rich. He answered yes, and that he had not informed me of his position in order that he might obtain sincere advice. Then he told me that if I wished to come to Italy and that we should travel like princes.

When he inquired about my affairs I told him that after toiling hard to obtain success in the Salon, the places assigned to my pictures were so bad that my efforts were lost. He asked if I had not influential acquaintances such as a dervish or a valet, and then he said we must change our rôles and that he would become my guide. The next day we travelled to Paris in a carriage. We traversed the dirty and narrow streets which then surrounded the Louvre, and went to a gallery where they were arranging the pictures for the Salon exhibition. He pointed out an assistant to me and bade me



tell the man that my picture was numbered 334, and he would oblige me if it found a good place. I was to give him ten francs. The process was repeated with other assistants, and finally by his direction I gave twenty francs to the chief of the men. All the assistants seemed to be acquainted with my friend. A week afterwards the Salon was opened, my pictures were admirably hung, and I gained my first public success. Then he said to me, "The farce is over, you are recognised by the public, and henceforth your pictures will have to occupy good positions. Take my advice, one never succeeds through great people; they are greedy and make their profit out of the simpletons who come to them. In preference seek the aid of humble people; by paying them you will be well served." We then parted, and I have not seen my old pupil since. Couture died several years before his friend.

The *Times* correspondent writes on Tuesday:—The Paris Municipal Council to-day, at a special sitting, unanimously authorised the Prefect of the Seine to accept the Dutuit bequest, and to set apart the Petit Palais for the housing of this collection. The Council also voted the thanks of the city of Paris to the collector's widow, and voted two resolutions—one opening a credit of 8,000 francs for the erection of two busts of the Dutuit brothers, and another to give the name of Dutuit to one of the Paris streets.

The moment is opportune to explain to English readers the importance of the extraordinary riches of this collection, which, in the words of M. Georges Cain, who had been asked by the Municipal Council to report upon it, is one of the most complete private collections which have ever been made. Not that it is likely to startle the uninitiated who will see it for the first time at the Petit Palais. But, unlike the Thiers collection, which, taken all in all, is still one of the eyesores of the Louvre, and is bound, alas! to remain so, the Dutuit collection is made up of rarities in every form of art—from ceramics to bookbinding, and from Renaissance gems and Chinese lacquer-work to masterpieces in painting. Nothing could be more eclectic and, on the whole, nothing surer than the taste displayed in the innumerable pieces of which this treasure is composed.

There are fifty Italian majolicas and Arabic plates, the equal, says M. Cain, of anything of the sort in the museums of the world; three of the finest specimens known of the exceedingly rare faïence of Piron, and Rhodes plates, Rouen ware, Sèvres and Dresden and Chinese porcelain, all of the finest quality. Among the glasswork there are some fine specimens of enamelled Venetian ware, lamps from Moorish mosques and Eastern vases. Among the enamels thirty at least are incomparable. The gems, Renaissance jewels, precious boxes, watches, Florentine and French medals, and the almost complete collections of Greek, Roman and French coins are, says M. Cain, remarkable.

The collection of paintings is not very large, some sixty canvases in all, but thirty of them, mostly Dutch, are masterpieces. There are, notably, a Rembrandt portrait of himself, two landscapes by Hobbema, five Teniers, a Ruysdael, Ostades, Cuyp, &c., while among the French painters represented are Claude Lorraine, Lancret, Boucher, Watteau, Diaz, Greuze and Fragonard. But more important even than the paintings are the engravings, the value of which is inestimable. No public collection in France, M. Cain says, is so richly varied. Thus there are two proofs of the Rembrandt "Hundred Gelder" print which, as is well known, is worth from 35,000 francs to 50,000 francs, and copies of which are of the utmost rarity. There are two also of the "Ecce Homo," two of the "Christ Healing the Sick," and three of the "Calvary." Albert Dürer, Mantegna, Callot, Silvestre and Nanteuil are all represented.

The collection of rare books M. Cain describes as "really incomparable." There are 800 volumes, among them some very fine illuminated manuscripts and missals and books of hours. The bindings are by the Groliers and the Masolis, and scores of the volumes bear the arms of French kings and queens.

One might go on to catalogue in detail the antiquities and *objets d'art*—Etruscan, Egyptian, Greek and Roman—notably the famous treasure of Annecy and the objects in ivory. Every department of this collection, save perhaps that of the furniture and tapestry, is of the very finest quality and of great rarity. When installed at the Petit Palais it will form a museum worthy of the building and the site.

An Excursion Meeting of the Northern Architectural Association will be held to-morrow, August 23, when the following buildings will be visited:—St Hilda's Church, Burbook Street chapel, All Saints, West Hartlepool; the Grand hotel, the residences of Sir C. Furness (Tunstall Court) and Mr. W. C. Gray.

## THE HOUSING PROBLEM.

A LECTURE was given in Cambridge on Monday by Mr. F. W. Lawrence on "The Housing Problem." It seemed to him that to make them feel the sensational character of the housing problem was quite beside the mark. It was more to the point that they should realise what overcrowding of the ordinary character meant. He then went on to speak of how it affected a clerk in London or the ordinary workman. But the housing problem was something above this—more than tightness of accommodation and high rent. It was a matter of poky houses, poky streets, great distances from fresh air. It was a problem of diet, ugliness, absence of fresh air and absence of healthy life. It was essentially a city problem. By means of diagrams the lecturer illustrated the growth of London during the past century, and described it as being like the successive growths of the onion. The growth of the suburbs had been phenomenal. No one who had lived in London for a long time could fail to recognise the tremendous fascination of the great city. But what they had to consider was whether it was necessary that the growth of the city should have in conjunction with it this terrible evil of overcrowding. He did not think it was. But the maxim they should bear in mind was that prevention was better than cure. It was one thing to talk about bad houses in London and insanitary areas, and it was another to prevent their growing where at present they were not. Every day the problem was changing. Twenty or thirty years ago it lay in Poplar and Bromley. Now it had gone to the extreme edge of Canning Town, Ilford, Willesden and the districts in the south of London. It was a problem that was to be solved at the outskirts of the city rather than in the heart of the evil itself. What they wanted to do in the suburbs was to create broad open thoroughfares. Another thing which he thought they might with advantage insist upon was the creation of open spaces. Fine broad avenues would be of commercial advantage, and it was the same with public parks in the long run. Some more or less definite scheme of broad thoroughfares should be adopted, and there should be a central authority having jurisdiction extending several miles beyond the streets already existing. The most essential thing was to try to save the suburbs which had not yet been overrun by the ugliness of some of our town life.

## AMERICAN PRACTICE.

THE long contest between Mr. Hutton, one of the architects who submitted plans to the Pennsylvania Capitol Commission in its second competition, and the Philadelphia Chapter A.I.A., has been brought to a termination, says the *Architects and Builders' Magazine*, by a peremptory mandamus from the Court of Common Pleas against the Philadelphia Chapter of the American Institute of Architects, commanding that organisation to restore Addison Hutton to membership and to allow him to enjoy the privileges which he formerly had in the chapter.

Mr. Hutton, it will be remembered, was expelled by the chapter for violating a resolution forbidding the submission of bids and plans by members of the chapter for the completion of the State Capitol Building at Harrisburg, Pa.

The case had considerable political significance, it having been stated that the chapter adopted the prohibitory resolution for bids on public work as a result of the favouritism shown to architects of the political party in power. The resolution was adopted on November 8, 1901, and in part read:—

"Resolved, that participation in the competition for the completion of the State Capitol at Harrisburg, under the programme submitted by architects, will be considered on their merits.

"Resolved, That the said programme issued by the Capitol Building Commission is calculated only to encourage favouritism and injustice; that it obligated the Commission in no way to select the best designs or architects, and that, therefore, we advise all architects in Pennsylvania not to enter the competition."

In his petition for a mandamus Mr. Hutton declared that the adoption of this resolution by the chapter was illegal because it exceeded the powers conferred on the organisation by its charter. The chapter made due return to the writ, and contended that the resolution was properly adopted, and that the defendants had a right to establish such a prohibitory order in view of the by-law, which was passed for that very purpose.

Mr. Hutton demurred to this return, contending that all the objects, powers and responsibilities of the Corporation were expressed in its charter, and in that alone. Therefore, he argued, the chapter had exceeded its authority when it passed the by-law looking to the adoption of the complained of resolution. The Court took this view of the case, sustained Mr. Hutton's demurrer, and granted a mandamus against the chapter.





PYRMONT BRIDGE, SYDNEY, SWING SPAN OPEN. PORTIONS OF OLD BRIDGE IN FRONT.

### AUSTRALIAN BRIDGE BUILDING.

IN Australia the art of bridge construction has made rapid progress during the last few years, and the Commonwealth can now boast several structures reflecting credit both on the enterprise of the various States and the skill of the State engineers, there being few works, if any, of this kind carried out by private enterprise. The latest instance has been afforded by the New South Wales metropolis, where the Pyrmont Bridge, Sydney, unites a couple of densely populated shores, separated by a broad arm of Port Jackson. We gave some account of the structure last week, and we now give two views.

For working the bridge swing, two 50 horse-power electric motors are employed, the power being obtained from a power-house forming portion of the Sydney electric tramway system, the motors being carried on a platform inside the drum on which the swing span is supported, and working through a train of out gears two vertical shafts, on the lower ends of which are cast steel pinions meshing with a cast steel rock secured to top of pivot piers. To take up the jar caused by the sudden stoppage of such a large moving mass, buffers, consisting of heavy coil springs, are fixed over each rest pier, being so adjusted that should the span when closing be travelling too quickly it will jump the catch in a similar manner to a swinging gate, thus avoiding damage and necessitating only the reversing of the controller to bring the span back to its correct position. The swing span is, however, so easily controlled by means of the mechanical hand-brake that these buffers have so far shown themselves not to be required.

The ends of the span when free of supports have a deflection of  $3\frac{1}{2}$  inches, but when closed, to prevent chattering due to heavy loads, the ends are raised  $1\frac{1}{4}$  inch by means of a 35 horse-power motor gearing on to a longitudinal shaft running the whole length of the span, and working two horizontal shafts carrying cams under each main girder. This

operation takes 15 seconds, an automatic electric device being provided for stopping the same in their correct position. Each of the four gates on the side spans is operated by a 5 horse-power electric motor, capable of opening or closing the gate in 15 seconds. Automatic gear for locking the gates is provided, and an automatic electric device stops the gate in its correct position, the operating of the gates being controlled by the man in the controlling-house at the centre of the swing span. Mechanical tell-tales are placed in the controlling-house, by which the operator can see on a dial the position of the end lifts, and the position of the ends of the span when opening and closing. To insure duplicate parts being always available in the colony, the motors and controllers are of the standard pattern adopted by the State Railway Commissioners for tramway purposes. The bridge and approaches are lighted with 19 arc lamps, whilst six red arc lamps are placed on the ends of the protecting platform to guide vessels through the swing opening at night, the whole installation being under the control of the man in the operating-house at centre of the swing span. The estimated cost is only 112,000*l*.

### THE "LAMP OF LOTHIAN."

A MEETING of the heritors of Haddington parish was held in Haddington for consideration of a request from the kirk-session to sanction the restoration or reinstating of the ruinous transepts and tower of the parish church, better known as the "Lamp of Lothian." A gentleman, who preferred at present to remain incognito, had made an offer of 7,500*l*. for the purpose provided the heritors were unanimous. A memorandum was submitted from the Board of Works agreeable to the proposal subject to certain conditions, among which it was stipulated that the future maintenance must be by the heritors. The Earl of Wemyss, a heritor, wrote opposing the scheme, in protest not only against the specific proposal, but against the





PYRMONT BRIDGE, SYDNEY. THE OLD BRIDGE WITH SWING SPAN OF THE NEW BRIDGE.

spirit of destructive restoration unfortunately at work at the present time, and which was now threatening to extinguish the "Lamp of Lothian." Lord Wemyss enclosed copy of a letter from Mr. Eustace Balfour, C.E. (brother of the Prime Minister), who has taken a great interest in the matter, saying that people did not realise what an act of vandalism the proposal would be. The Society for the Protection of Ancient Buildings intimated that they would do everything in their power to frustrate the proposal. A deputation from the kirk-session said that body was unanimous in favour of restoration. The question of plans, which were numerous, was not discussed. After some discussion a motion to appoint a committee to collect all information, and if necessary consult an independent practical man, was agreed to unanimously, and a committee of twelve was appointed. There has been a great deal of discussion regarding whether what is known as the present "Lamp of Lothian," or "Abbey Church," or "St. Mary's Church" was the original "Lucerna Laudoniæ." The weight of evidence is probably against the present church and in favour of one which stood a hundred yards or so further north. The nave of the present church was restored in 1812, and again about twelve years ago, when an organ was instituted and great improvements were carried out. This is the only portion where public worship is conducted, all to the east, where Mrs. Carlyle is buried, being in a somewhat ruinous condition.

#### THE PURPOSE OF SCULPTURE.

ON Saturday Mr. Alfred Gilbert, R.A., lectured at Cambridge on the subject of "Sculpture." He observed that the art of sculpture had many and varied sides, and the more he worked the more he tried to find out which was the right and proper road to perfection. Sculpture was not merely a doing, a making, or the mere expression of a man's idea. It was threefold in its purpose. It was mechanical, to begin

with; it was real, to go on with; and it should be—and must be, if it was to carry any message forward—ideal. The work of a sculptor was not merely the work of one who hewed and broke and tried to make. His efforts should be moulded by that something called love, veneration, faith—that love which impelled him to give up everything, to do everything in his power to educate and lead his fellow beings to that extraordinary refinement and delicate perception of the beautiful which alone could be understood by those who love. Pygmalion so loved the image his own brain had created that he longed that the great creation should speak. The sculptor's great object was that his creation should speak—without the aid of an exhibition catalogue. The work of the artist should be the work not only of his art, but of his heart. The function of sculpture was not merely the making of an object. The primary object was to make something beautiful, something that whoever saw it should be elevated by it, something that was not the mere imitation of an everyday person. The more he thought the more was he astonished that the practice and the teaching and the encouragement of the art was so little thought of. The equipment of the sculptor was not sufficiently given in our art schools. The sculptor should be as well equipped as the mathematician, the poet or the architect, by education. He wanted to connect the practice of sculpture with the practice of general education. Until they did that he was convinced that they would never hope to take rank as artists with the great men among the Greeks, whose excellence was the outcome not only of a pure mechanical training and skill, but the influence of great mental culture. The artist must read and think, and the more he thought the better artist he was likely to be. He had been twenty-five years in finding out that he knew nothing about the making of a statue. He was only just beginning to know how to approach the exposition of the art, which was to make everything he touched as beautiful as his own unbeautiful nature would allow him to do.



## NOTES AND COMMENTS.

It is satisfactory to find that an effort has been at last made to enforce the Factory and Workshops Act of 1901 in London, where the provisions have been almost entirely neglected. A week ago the London County Council summoned the Columbus Company, Ltd., for employing more than forty persons on premises in Fetter Lane without being provided with a certificate from the Council that there were such means of escape in case of fire as could reasonably be required. The defence was that the company were only yearly tenants and would vacate the premises at the end of the year. The freeholders would, no doubt, put the premises into proper condition, which would necessitate an outlay of 500*l.* or 600*l.* It was suggested by the Council's representative that meanwhile a fire might break out. The Alderman adopted that view and a fine of 10*l.* was imposed with 5*l.* 5*s.* costs. The decision deserves general approval, and it may have the result of compelling people to accept their responsibilities by providing means to prevent the repetition of such catastrophes as that in Queen Victoria Street.

THE explorations undertaken by the French in Tunis have brought to light several examples of Roman remains. Some of the work is of higher quality than what is seen in many parts of Europe. One of the latest discoveries is a Temple of Mercury at Baugrara, which was an instance of polychrome decoration showing more refinement than is usually credited to Roman builders. In the vicinity of the temple the ruins of a large villa have also been unearthed, in which colourwork was employed not only in mosaics but in frescoes. The soil of Tunis is favourable to the preservation of stonework. It is possible to realise the appearance of Baugrara from the position of the temples and other public buildings. There is no doubt the discoveries will increase French prestige, and they give satisfaction to all the officials who have had the privilege of taking part in the operations.

THE report of Dr. COLLINGRIDGE, the medical officer of health for the City of London, contains interesting statistics. It appears that according to last year's returns, during the day the density of population was 519.6 persons to an acre, but at night it fell to 40.8 persons. It should, however, be noted that in preparing the last census no enumeration was made of the day population in the City. It was, however, found that 1,186,000 persons entered and left the City on one day in May. The assessed rateable value of property, "including temples," was 4,864,543*l.* in 1901, or nearly an eighth of the whole administrative county of London. The mortality in 1901 was 16.6 per 1,000; in the Metropolis it was 17.1, and in thirty-three great towns in England and Wales the average was 18.6. In City institutions such as workhouses, infirmaries and asylums the deaths were 25.2 per cent. of the whole City mortality. This is caused by overcrowding, for 1 in every 25 citizens is an inmate of either a workhouse, workhouse infirmary or a lunatic asylum, in comparison with 1 in every 101 inhabitants of the Metropolis. It is found that of the City deaths 7.45 per cent. were caused by injuries or violence. The large proportion of deaths from violence within the City as compared with the rest of London, though striking, is easily accounted for by the enormous concentration of vehicular traffic in crowded streets and the greatly increased danger resulting therefrom. It is probably only due to the excellent management of the traffic by the City police that this mortality is not much larger. In the artisans' dwellings belonging to the Corporation the death rate is below the average. It has been ascertained that the sanitary fittings are now obsolete, and it has been decided to remove all the existing water-closets and to replace them by others of a modern pattern. This is an example which should be imitated by other owners of dwellings, for although the buildings only date from 1885 many sanitary improvements have been since introduced. It is also proposed to supply a certain number of baths in each building. Over fifty tenement houses were closed or demolished during 1901. In Beech Street and Fann Street

the owners of some insanitary dwellings preferred to pull down the houses rather than comply with the sanitary committee's requirements, which would have involved more expenditure than the property was worth. In flushing streets and alleys of the poorer parts of the City no less than 39,708,690 gallons of water were employed, besides many thousand gallons of disinfectants. In the neighbourhood of Billingsgate deodorants have to be used at least twice in twenty-four hours.

FROM time to time there is a resurrection from obscurity of veteran French artists, and in fact it has grown difficult to determine who is the Nestor among them. The latest revival is M. CHARLES FAMIN. He won the Prix de Rome for architecture as far back as 1835; that is to say, fifteen years prior to M. BOUGEREAU, twenty-three years before M. HENNER, who are both considered as veteran painters, and eleven years before M. NORMAND, the architect. M. INGRES was then director of the school, and among M. FAMIN's contemporaries were PILS, GOUNOD, the composer, BOULANGER, and FAROCHON, the sculptor. M. FAMIN was born in 1809. His father was the architect who had charge of the Château Rambouillet. When a child he encountered NAPOLEON I. in a conservatory, and was embraced by the Emperor. M. FAMIN now lives at Chartres, and his memory still enables him to relate many interesting stories of his early days.

AS the late JAMES TISSOT, who died at his country house, the Abbey of Buillon, on the 9th inst., was born in 1836, it was to be expected that his work was not entirely completed, for he was still competent to present another phase of art. He was a painter of extraordinary versatility. He studied under FLANDRIN and LEMOTHE. The former revived religious painting, for the examples by him in the church of St. Germain de Près and St. Vincent de Paul are unlike the efforts of other painters. TISSOT could hardly escape from the influence of the master, but several years had to elapse before he attempted Scriptural subjects. At first he was thought to aim at becoming the favourite painter of Boulevardiers. Then he came to London and painted English subjects, and it was sometimes difficult to determine whether they were not meant for the amusement of Parisians. In his fiftieth year a change came over him. RENAN had given a new interpretation of the life of CHRIST, which was derived from his observations in the Holy Land. The book was not approved by all Christians, and efforts were made to counteract its influence. TISSOT realised that what RENAN had done with his pen could also be attempted by an artist with his pencil. Both the mystics and the great Renaissance artists had, he said, alike abandoned historical and topographical accuracy, and he therefore resolved to depict with fidelity the local characteristics which must have corresponded with those seen when CHRIST lived. A similar attempt had been made by some English pre-Raphaelite painters for occasional illustrations of New Testament history. But M. TISSOT avoided elaborate oil-paintings, and confined himself to the production of three or four hundred water-colour drawings. They were illustrations of M. RENAN's book rather than of New Testament history as popularly interpreted. The artist reckoned the series to be worth 60,000*l.*, but he accepted 40,000*l.* for them, and they were reproduced. The drawings have their use, but as works of art they fail because they do not express the colours which pervade all things in Palestine.

## ILLUSTRATIONS.

ILCYD'S BUILDING, FENCHURCH STREET, E.C.: ROAST-ROOM

CATHEDRAL SERIES.—HEREFORD: THE NAVE.

GLENROY, FINCHLEY: EXTERIOR, FROM GARDEN FRONT.

DESIGN FOR PUBLIC BATHS, BRAMLEY.



# TECHNICAL EDUCATION IN GERMANY.

THE following information concerning the provision for technical education in Germany was given before the Royal Commission on University Education in Ireland by Colonel G. T. Plunkett, C.B., director of the Science and Art Institution, Dublin:—

Mr. Justice Madden: You have given special attention to the provisions made on the Continent for technical instruction?—I went this year on the Continent, not for the first time, to look, in addition to other things, into the progress which had been made, especially in Germany, within very recent times, in the great technical colleges—in the extension of those colleges and of their work.

You have a general acquaintance with the German system of technical teaching?—Yes, I have, especially with the technical colleges and the higher class of technical teaching.

The colleges—polytechnic institutions or colleges—are quite independent of the universities, are they not?—They are absolutely independent and separate in Germany.

In fact they might be termed "Technical Universities"?—They are institutions complete in themselves?—They are institutions complete in themselves, yes.

And they give technical instruction of the highest kind?—Of the very highest kind—what is not usually spoken of here as technical instruction. Of course, it is a very comprehensive term. "Technical instruction" might include the education of a doctor or a lawyer. But the instruction given in these colleges is the instruction, generally speaking, of what are known as engineers—mechanical, electrical, mining, civil—and of chemists for all kinds of practical work, manufacturing chemists and constructors of chemical works, and leaders of great industries of that sort; to educate them.

We all know that there are two classes of schools in Germany—the *Gymnasien*, which correspond to our grammar schools, and the *Realschulen*, which might be described as modern schools?—Yes, there are.

The students from these schools pass, as a rule, either to the polytechnics or to the universities?—A very large number do; that is the object.

That is the idea—that they should go forward from what we call secondary schools, according to their ideas of life, or their destinations in life, either to the universities or to the polytechnic schools?—Yes, that is the case exactly.

Side by side with these polytechnic schools there are schools which give technical education of a more practical character, which might be described as a sort of apprenticeship?—Yes. In Germany there are what they call "handicraft schools," for educating superior artificers, foremen, designers and so on. Youths who enter the technical colleges are from the same classes as those who enter the universities, and would very seldom have been educated in public elementary schools; or clever boys from those there are the handicraft schools for training superior artisans.

I mention that because our attention has been called to the necessity of carefully distinguishing between the kind of technical education which corresponds to the teaching of an apprentice by his master and the higher technical education with which alone we are concerned. That distinction is clearly maintained in Germany in the way I have indicated?—It is clearly recognised in Germany—absolutely.

Is there any training in the polytechnic schools other than the higher technical education; I mean, is there any arts course, or a course of instruction in pure science?—Undoubtedly, some students take up chemistry or physics, for instance, in one of these institutions. They are not now called polytechnics, but *Technische Hochschulen*. Some students undoubtedly do take these sciences up, and from taste or some other reason do not go so far, perhaps, in the applied science, and become professors or teachers of pure science. But that is not the object of the institutions; it is simply that you cannot prevent a man, when he has been educated, going to what line he likes. The object of the institutions is as you have put it—to turn out what we call, roughly speaking, leaders of industry.

And to train mining and electrical engineers?—Electrical engineers—men who are fit to design and to carry out great electrical works, for carrying power, or for lighting towns and so on—not merely men who go round with a gang and carry out the work.

Is there any work in the direction of research done in these polytechnics?—There is a great deal. At Charlottenburg especially, there is a great deal of research done.

Discoveries in chemistry have resulted in the establishment of new industries; is that not so?—Most certainly. And not only that, but I was thinking while you were speaking of the advances which have been made in mechanical inventions, of the improvement of engines. Engines of different kinds are sent by inventors to be tried in such places as the Physical Institute, which is alongside and practically part of the Charlottenburg *Technische Hochschule*, and advances in mechanical science and electrical science are made by the researches

carried on in these laboratories, as well as in chemistry in the chemical laboratories.

Are the students trained in research, or is the work of research done by the professors?—The students are certainly trained. I did not see all of the institutions, but there is a great deal of training given to students in these great colleges in the methods of research.

At what age, generally speaking, do students enter these schools?—Those who are going to be mechanical and electrical engineers are, generally speaking, looking to employment on the State railways, which are the railways of Germany, or some other such great branch of the Government Technical Service, and these are obliged to spend a year of practical training in a workshop before they can enter on their course; therefore they are generally nineteen or nearly so before they enter. That year in a workshop is generally made into two years, because I found on actual inquiry from firms who make machine tools, ironworks and so on, that they will not take one of these young men for less than two years. They say that one year is useless. Therefore these youths who left school at about seventeen years of age or a little over are nineteen before they go into these colleges. But a considerable number of others who are not going into these mechanical lines enter the colleges at eighteen and seventeen years of age.

How many years does the course of study cover?—Three years is the minimum for what we should call an associate course. A great many take four years. An engineer very often indeed takes a three years' course, takes out his diploma then as a mechanical engineer, and then takes another year in order that he may have two diplomas—one mechanical and one electrical—a great part of the courses being identical for both.

There are apparently diplomas in different branches?—Yes.

Can you tell us what diplomas are given?—They can also give the degree of "doctor of science"; it is only within the last two years that that privilege has been given to these colleges.

Is it given to all of these colleges?—To all of the *Technische Hochschulen*; they are all under the one central authority for education.

That is a matter merely of detail; do not interrupt your evidence.—The information would be in many of the books and returns; I could send it.

The education there eventuates in a diploma, and you say that recently, within the last two years, these institutions have been enabled to confer the degree of doctor of science?—Yes, of doctor of science.

That degree they confer quite independently of the university?—Quite.

Most Rev. Dr. Healy: Do they confer the degree of bachelor of science?—I do not know; I believe there is no such degree in Germany.

Mr. Justice Madden: At all events, you know that they confer a recognised degree in science, that of doctor of science?—I know that.

You mentioned that these German technical colleges are under a central government?—Entirely.

Can you tell us whether it is a department of the State?—Yes; the Department of Education of each State in Germany.

The Department of Education in Germany is charged with primary and ordinary secondary education, as well as with this technical education?—I believe that it is charged with the primary and the secondary or intermediate and the university education of the country, as well as with these technical colleges. But I only believe that; I am not certain.

It is charged with education generally?—Yes, so I believe; with all the education of the country, except that given in the handicraft schools, which are under the municipalities.

I know that you have visited a number of these institutions, and I will ask you some questions about them individually. But I should like to know whether these separate colleges—take Darmstadt, Hanover, Aix-la-Chapelle, Charlottenburg—are self-governing institutions; are they what might be called autonomous colleges, or are they governed from a central authority? I mean in the matter of prescribing courses and in the internal regulation of the colleges?—I did not inquire particularly into that, but so far as I gather from talking with rectors of one or two, and with several professors, I think the course is very much the same in all, and that, speaking generally, though little details might be left to the councils of the colleges, all the general lines are laid down by the Department of Education.

Passing for a moment to the universities, they teach science?—They teach science. But the only university I went to this year was the University of Berlin, to see their new chemical laboratory, which is rather a famous building—I mean, it is a very fine one—and I gathered that, with a few exceptions, the chemistry taught there is entirely for those who are going to take to medical or pharmaceutical work; it is a preparation for that.

In fact, it is a preparation for one of the old professions?—



For one of the old professions, though I found there was an exception myself; there was an American student there who had been working in this country as well as in America, and he was there doing in vacation some research work with a German.

I should conclude that students who intend to become mechanical or electrical engineers, or scientific chemists, do not resort to the old universities?—No, certainly not; as a rule, they undoubtedly go to these new technical colleges.

How are ordinary civil engineers educated in Germany—do they receive a university degree or diploma, or do they receive their education at the technical schools?—They receive their education from these technical colleges.

Therefore they have not the advantage of an arts course in a university?—They have not; but it should be remembered that, according to the German school system, they have had a very excellent education up to the age of seventeen years, at least, before they go into the college.

Before they leave the *Gymnasias* probably?—Or the *Ober Realschulen*.

Is there anything in the nature of a leaving certificate given by the *Gymnasias* or *Realschulen* which carries the student up to the technical college?—Oh, yes.

That, I suppose, is a guarantee of some instruction in arts—of a certain amount of liberal education?—It is a guarantee of a very fair liberal education.

Though not exactly of the university type, but of the type of the higher secondary school?—Yes.

Dr. Starkie: Is it not a fact that even in the case of the universities the leaving certificate would relieve a student from any further study in arts?—I have heard that, but I do not know it of my own knowledge.

Mr. Justice Madden: That is to say, a student who takes up a scientific course in a university can specialise at once?—I believe that is the case, though I did not actually inquire into it as a matter of fact myself.

You mention Berlin. You visited not only the university there, but the technical college?—The Charlottenburg institution is the great technical college of Berlin, though it is referred to as the Charlottenburg College, it being in that suburb.

That is one of the technical colleges?—Yes; it is the finest of those in Germany—the largest.

How many students has it?—It had about 4,800 last session, and the rector, with whom I had a long conversation, said that he confidently expected 5,000 this October, and there were some new buildings in connection with the electrical laboratories and mechanical laboratories just then in progress, which he said would enable him to cater well for 5,000.

Dr. Starkie: Are they all day students?—All day students; there is no evening work.

Mr. Justice Madden: No evening work?—Nothing after seven o'clock at all; nothing after six o'clock generally. I said to the rector that I presumed when they had sufficient buildings and plant to educate 5,000 students, they would have sufficient for the needs of the country for a good many years to come, but he said, "Not at all; I confidently look forward in a few years to having to add 50 per cent. to the whole of our accommodation."

When you say "the needs of the country," you mean that portion of the country, because there are several of these schools in Germany?—Quite so; it does not cater for the Rhine Provinces, Hesse and many other parts. They not only consider they will have to increase their present colleges, but, in addition to the number they have, they have one now in progress of building at Dantzig, and they have decided on commencing another at Breslau.

The necessary funds for the establishment of these great colleges are supplied by the State, are they not?—Partly, and partly by municipalities.

Partly by municipalities and partly by the State?—And partly by the fees of students.

The students' fees, of course, would be a source of income?—Yes.

They are established by funds contributed partly by the State and partly by municipalities?—Yes.

Probably you are not in a position to tell us in what proportions?—I do not know the amount in the case of Charlottenburg, but I did find out exactly in the case of Darmstadt, the proportions they paid towards the annual income. The State of Hesse contributes 5,000*l.*; the city of Darmstadt contributes 10,000*l.* (I am taking one mark as equivalent to 1*s.*), and then the students' fees come to 15,000*l.* per annum. So that their annual expenditure is about 30,000*l.*

Dr. Starkie: What are the students' fees per head?—I can tell you, roughly speaking. Students who take the courses which correspond to our Associate course in the Charlottenburg College pay from 15*l.* to 20*l.* per annum; in the Darmstadt College the fees appear to be lower. Fees are remitted in some cases of promising students who cannot afford to pay.

Mr. Justice Madden: With reference to Charlottenburg, I presume that the technical school is supplied with adequate

apparatus and laboratories?—It is very handsomely equipped indeed; it is equipped on a magnificent scale in all those respects.

Were the colleges equipped by the State, or by the State and the municipalities conjointly?—That I cannot say.

The equipment is of a kind specially adapted for technical teaching, whereas I presume the equipment of the Berlin University is specially adapted for the kind of teaching which you have adverted to—University teaching?—Undoubtedly, though a chemical laboratory will be to some extent very much the same, whatever the object of the teaching is to be.

But very special appliances are necessary now for the training of engineers—mechanical and electrical—over and above the chemical laboratory that you might expect to find in an ordinary university; is not that so?—Very much so, as exemplified in the case of Charlottenburg Institute.

It would be very interesting if you were to give us an account of the nature of the equipment which you found there, because, I suppose, that could be taken as a thoroughly well-equipped technical school?—It is the finest. In the engineering machine-room, which was 164 feet long and 33 feet wide, all new types of engines are examined and tested. There is considerable competition amongst manufacturers of engines and machines to get their inventions sent in there for some weeks or months to be thoroughly tested and indicated by the professor and his assistants with his classes of students. So that not only do the students learn all about a new machine, but at the same time the inventor gets to know thoroughly, and brings before the public its capabilities. There are a professor and six assistants simply for the teaching in that one room. There is, among others, a new engine, called the sulphur-dioxide engine, which is being tried there, and which the professor himself or one of his assistants told me they thought might save 30 per cent.—increase, that is to say, the power derived from the fuel by 30 per cent., but it was still under experiment. In what is called the Engineering Institute there are a number of testing machines, in which manufacturers and contractors and others can have tested steel, iron, cement, stones, building materials of all kinds. There is one machine in it which is capable of testing up to 100 tons' resistance both to tension and compression, and also of registering a metal's elasticity. There is another one for testing up to 50 tons, a third for testing flexure up to 50 tons only, and another which will test any kind of strain—tension, compression, flexure—up to 100 tons. There is one for testing blocks of iron and stone for compression and tension up to 100 tons. I took these notes as an example of the liberal way in which these institutes are supplied with machines of all kinds. That is an institute which is considered insufficient. At present it is used by the public, by which I mean contractors and engineers, who send their materials to be tested. It is also used by professors of the college, who bring their students in to see the operations and to assist in carrying them out, and to learn. But they are going to build a new institute entirely, to which the larger machines will be removed, and no doubt some new ones added for the outside public, if I may say so, while this one will remain with the smaller machines only for the student classes. There is a laboratory attached to that part, quite in addition to the chemical branches of the college, for testing the resistance of materials to fire and to acids, that is to say, cement, building stones and bricks; there are diamond drills and saws for cutting sections of hard stones; there is a refrigerating machine for trying the strength of building stones and other such materials when they are reduced to very low temperature, to try the action of frost upon them. There is another room for the microscopic examination of oils, materials for making paper, and so on. This is all in one annexe, if I may call it so, in addition to the chemical and other laboratories of the college. The chemical department is a large annexe. As regards the students there, speaking generally, though there is a great deal of option as to the length of the course they will take, there are many ways in which they may take it, some taking more general science, some taking more special; but as a rule I found, as the result of a good deal of questioning, they take two years' general instruction in science in the college, then one year of pure chemistry, then one year, and very often two years, of some special branch of applied chemistry. To show the size of the annexe, I may say that there are over fifty lecture-rooms and laboratories in it. As an instance of the liberality with which they equip these colleges, perhaps I may mention that the exhibits which were collected in Germany for the Paris Exhibition in the chemical industry section, which are said to be worth 30,000*l.*, were brought back from Paris and the whole of them handed over to the Charlottenburg Institute. Seventeen professors and assistants in that college were sent to Paris to study the particular exhibits which bore on their teaching. In the department where electrical engineering or electro-technology is taught there is one very large laboratory divided into what they call eighteen stations, with a motor and dynamo to each, at which a group of four or five students is taught, so that the men get very individual and careful instruction. There



s a long gallery with three laboratories off it in which others are taught, so that altogether 300 students are working at electro-technology at one time. They had two accumulator batteries of sixty cells each. I thought it not worth while to inquire as to the exact number and power of the dynamos, as I could not keep the professor too long, but I found that it took one 25 h.-p. and one 100 h.-p. engine to work their electrical dynamos alone. There is an architectural faculty, as we should call it—an architectural division of the college. They have a large gallery and a large number of rooms, with an immense collection of architectural casts and drawings and diagrams, and I had a talk with the professor in charge of that department, as well as with those in charge of the engineering, and they seemed to think that it was very advantageous to an architect that he should learn the art of architecture there, and at the same time he could take courses in the practical part of building construction. With reference to what I said as to the students for the mechanical and the electrical engineering having first to take courses of one or two years—at least one year—in a workshop, the professors said that though the rule was obligatory only upon those who were going in for Government employment—which means a very great deal in Germany, as the railways are in the hands of the State—they would like to see that rule applied to all. They thought it should be, and they hoped it would be a rule made for all who were taking mechanical engineering.

Professor Lorrain Smith: You mean in the sense of getting the degree legalised?—They would like it to be a rule that no man could have a diploma given to him in mechanical or electrical engineering (which go together) unless he had spent at least one year at the bench in a workshop before going into the college. I gave a good deal of attention and inquiry to that point, because I know that their system and the American system are so very different, and the French is different again. I wanted to see what their views were, and that is what the professors said. I think those are the principal points which occur to me.

Mr. Justice Madden: As you are aware, we are inquiring into technical education in its widest sense, but in relation to university education?—Yes, I understand that.

So far the result of your evidence has been to place these side by side; but technical education is in Germany something outside the ordinary university system?—It is in Germany.

Has there been a movement in Germany leading towards any co-ordination or co-operation between the universities and the technical schools?—I heard nothing of that sort whatever. I think that they feel there is ample room for both, that what you alluded to as the older professions will keep the one full, and that the great demand there is for mechanical and electrical engineers and manufacturing chemists, and so on, will keep the others full.

In the universities is there any desire to undertake technical training, or is it considered advisable to leave it to the technical schools?—I am not able to answer that.

You are not aware of any movement of that sort?—I am not aware of any movement of that sort, but my inquiries were entirely among those connected with technical colleges or with manufacturers who made use of them themselves.

## RECENT DISCOVERIES IN CRETE.

THE special correspondent of the *Times*, in an important communication from Candia, writes:—

The principal discoveries of the past season up to the end of last April have been described by Mr. Evans in these columns. His anticipation that the remaining operations would be productive of interesting results has been amply fulfilled. On the northern side of the palace, near the north-east corner, a large portico has been revealed with double rows of six columns. The portico was evidently approached by a road leading up through the neighbouring valley from the sea coast; on the inner side a stepway communicates with the central court, the passage being flanked with bastions of huge square stones marked with tridents. This was evidently the sea gate through which the poetic imagination may picture the Minoan sailors passing with bands of captive pirates or, it may be, a disconsolate train of Athenian youths and maidens on their way to the lair of the Minotaur. One would gladly accept Mr. Evans's attractive idea—that in the intricate passages of the palace we find the original of the legendary Labyrinth, the haunt of the monster, and that the name is derived from the Carian "labrus," the double battle-axe, a sacred symbol which occurs so frequently in every part of the building. But his theory seems almost as applicable to the complicated structure at Phæstos, the other great palace now brought to light, where the double axe, which was also a symbol in the early Cretan script, repeatedly appears as a mason's mark, alternating with other signs. Notwithstanding the local legend, the fresco-paintings and reliefs of bulls at

Knossos can scarcely be taken as imparting a special character to the palace in view of the very frequent representations of the animal in Mycenaean art; nor is it easy to abandon the older view which connects "labyrinthos" with "laura," an a closed passage or alley—the name of more than one Greek monastery—and "Laureion," "the place of the the catacombs"—the mining town in Attica. A little below the north portico is a great sewer passing into the adjoining valley. In general the sanitary arrangements at Knossos seem to rival those of our own times. Shafts from the upper storeys communicate with conduits in the basement; the drain-pipes are almost exactly similar to those recently found by Professor Dörpfeld at Lerkas, and present a wonderfully modern appearance. On the south-eastern side of the palace another portico has been discovered with six columns and a corner pier. In the same quarter of the building—the residential portion of the palace—a number of ivory statuettes have been found in a kind of cupboard; here, too, on the last day of the excavations, I witnessed the clearance of a small chapel or shrine, where an altar-ledge with horns, a votive double axe of steatite, and various sacrificial objects were found.

The remarkable excavations carried out by the Italian archaeological mission at Phæstos under the able direction of Professor Halbherr form a counterpart to Mr. Evans's great undertaking at Knossos. The works, which were begun in June, 1900, occupied three seasons, and, like those at Knossos, have now been practically concluded. The site of the ancient Homeric city, the rival of Knossos, was identified by Admiral Spratt half a century ago, though no trace of the masonry was visible except a few calcined blocks on the summit of the acropolis. Phæstos lies almost due south of Mount Ida, at a distance of some three miles from the southern coast. The situation is one of extraordinary beauty; the acropolis, on which the fortress-palace of the Mycenaean "anaktes" stood, is the most easterly of a series of three eminences commanding a magnificent view over the wide plain of Messará, with its rich olive groves, cornfields and ruined Moslem villages; on the north are the snowy summits of Ida and the strange twin peaks of Kamáres; to the south-west is a charming glimpse of blue sea with the islet of Paximadi on the horizon. The architectural lines of the palace are incomparably more striking than those of Knossos. Here, also, there is a large western area, or agora; the pavement is traversed by some curious slightly-raised diagonal lines, which perhaps had reference to ceremonies or games celebrated in the enclosure. The agora terminates at its northern end in a broad series of stone steps, apparently intended for an auditorium. To the west, protected by a ramp—the Homeric "erkos"—another wide and imposing flight of steps leads up through a portico to the great hall, or "megaron," which measures 27·70 metres by 13·75, thus surpassing in dimensions any Mycenaean apartment yet discovered. The "megaron," like the "Hall of the Double Axes" at Knossos, is divided into two portions—a vestibule and an inner chamber consisting of two compartments separated from each other by three columns. To the right are the storerooms or magazines, ranged on either side of a broad corridor; in the centre a great stone pier, which apparently serves no structural purpose, may conceivably furnish another example of the Mycenaean pillar-cult. From the magazines we pass through another large "megaron" with columns, probably the hall of the men, as distinguished from the women's hall in the gynæconitis, into a vast rectangular space flanked with porticoes—the central court of the palace. In the whole range of Mycenaean discoveries there is nothing more imposing than this magnificent quadrangle; viewed from its southern end, with the snowy crest of Ida towering above, it possesses a strange and wonderful beauty in its present solitude and desolation. A broad doorway to the north, with niches on either side, apparently designed as sentry-boxes for two eunuchs, leads into the gynæconitis, the women's quarter, with thalami or bedrooms, a bath, a columned "megaron" and propylæa opening to the north. The buildings on the eastern side of the great court communicate with the gynæconitis, and are conjectured to have been the residential quarter; on the western side, separated from the magazines by a broad corridor, are a great number of small apartments, which were probably inhabited by servants.

Any adequate comparison of the two great palaces of Knossos and Phæstos would be excluded by present limits. The buildings present many points of similarity in general design, architectural features, mode of construction, and various details. Both sites were inhabited from the remotest times, as may be concluded from the neolithic deposits in the lowest strata. The abundance of "Kamáres" pottery at Phæstos shows that the place had attained considerable importance in pre-Mycenaean times. This type of ware occurs more sparingly at Knossos, where it appears in some of the lower levels. The palaces were both destroyed by fire in the Mycenaean age, but Phæstos, after a certain lapse of time, perhaps two centuries, was occupied by new settlers, of whom traces are found



in courses of post-Mycenæan masonry and in pottery of the "Kurtes" type, which is transitional from the late Mycenæan to the geometric. Thus we have an explanation of the comparative scarcity of Mycenæan domestic objects found at Phæstos. These were to a large extent used up, destroyed or removed by the subsequent inhabitants. Mycenæan Phæstos appears to have flourished somewhat earlier than Knossos and at a period anterior to the highest perfection of Mycenæan decorative art; the paintings, for example, are more primitive and conventional than those at Knossos, which abound in subjects taken from nature and real life. On the other hand, the structural magnificence of Phæstos—largely attributable, of course, to the greater capabilities of the site—the contemporaneous employment of the older cyclopean style with the use of squared blocks, the judicious selection of local and foreign materials, and the combination of solidity with elegance bear witness to the fullest development of Mycenæan architectural science. The excavations have confirmed the classical tradition with regard to the greater wealth and power of the Minoan city; the magazines at Knossos are more numerous and extensive—the curious cists let into their flooring for the concealment of treasure find no parallel at Phæstos—while the greater size and more elaborate painting of the vases and the representations of jewelled ewers and goblets and magnificent gold ornaments speak for themselves. There is little or nothing at Phæstos to show the existence of those Babylonian and Egyptian influences which are so marked at Knossos. Lastly, while evidence of the existence of Mycenæan writing is furnished by the inscribed stones and vases at Phæstos, no counterpart to the Knossian archives has been discovered here, with the exception of a single inscribed tablet with mixed linear and pictographic signs.

Professor Halbherr's brilliant discovery of another Mycenæan palace at Hagia Triáda (more correctly Hagia Trias), a few miles to the west of Phæstos, may be described as the sensational event of the past season. The palace stood on a picturesque hill top overlooking the alluvial plain, through which the Lethæus wanders on its way to the sea; at the nearer end of the plain is the tall smooth rock, "*lisse aipeia te eis hala petre*" (Odys. iii. 293), still confronting the waves of the Libyan sea; but it seems probable that in Mycenæan times a portion of the plain was submerged, the shore being in closer proximity to the palace, which Professor Halbherr conjectures to have been the maritime residence of the kings of Phæstos. The excavations, which were not begun till the closing days of the season, have yielded results which give promise of a rich series of discoveries during next year's campaign. In addition to the objects briefly described by telegraph three more tablets have been brought to light with pre-Hellenic inscriptions, two frescoes and a magnificent vase of black steatite. One of the frescoes displays a wood with plants and rocks, on which a bird, a cat, a hare and other animals disport themselves; the other gives an almost life-size representation of a Mycenæan lady arrayed in a sumptuous robe. The vase, a *chef-d'œuvre* of Mycenæan art, presents twenty-six figures in relief. A band of warriors, armed with tridents, marches along, preceded by shouting heralds and headed by a chief with long Homeric hair and heavy cuirass. The faces and figures supply well-marked and definite types, which will aid in the study of the pre-Hellenic Cretan race.

To the researches carried out by Miss Boyd at Gourniá and by Mr. R. C. Bosanquet at Palæocastro only a few words can be allotted, though both are deserving of a fuller description. At Gourniá, near the northern shore of the isthmus which connects the peninsula of Sitia with the rest of the island, a small but well-preserved Mycenæan settlement has been brought to light. Many interesting objects have been discovered: sacrificial vases, bronze saws and other implements, together with ante-Mycenæan fetishes and idols; what is more important, however, a sensible addition has been made to our knowledge of Mycenæan domestic architecture owing to the excellent preservation of some of the buildings. At Palæocastro, at the extreme east of the island, Mr. Bosanquet has obtained some notable results. Though the site has not been identified as that of any known Cretan city, the place appears to have been an important centre in Mycenæan and pre-Mycenæan times. Hitherto graves of the "Kamâres" epoch were practically unknown, but two cemeteries of this period have now been found here. They consist of small enclosures of masonry, divided by parallel walls into long, narrow compartments tightly packed with skulls and with heaps or bundles of bones. The bodies were apparently first buried elsewhere, and the bones, cleansed by interment, subsequently transported to their final resting-place. Thus a method of sepulture now commonly prevailing in the Levant would seem to have been in vogue before the Mycenæan age. In one of the cemeteries were found 140 vases, one apparently to each skull. Some Mycenæan tombs were also opened, in which the bones, as elsewhere, were found in "larnakes," or earthenware chests. Close by the sea, at a spot called Russolakkos, is a group of Mycenæan man-

sions, of which two have been cleared out. The larger of these presents a type intermediate between the ordinary Mycenæan dwelling and the great palaces of Knossos and Phæstos. It reproduces many features of the palaces, such as a columned "megaron" with adjoining bathroom, an upper storey approached by two staircases—one of them 7 feet wide—and magazines with vases of all sizes. Of all the objects brought to light here the most interesting is a tablet bearing seven lines of a linear script akin to that of the Knossian archives.

The excavations at Palæocastro will be continued next year should the requisite funds be forthcoming. For the work carried out by Mr. Bosanquet this season the modest sum of 150*l.* was all that was available. It must be remembered that while foreign Governments liberally support their several scientific missions in Crete and elsewhere, British archaeological enterprise is entirely dependent on voluntary contributions. For many years to come Crete will offer a field of extraordinary interest for exploration, and it is earnestly to be hoped that those who have already done so much to sustain the reputation of British scholarship and research will not be allowed to abandon their work for the want of the necessary means.

### THE BRITISH MUSEUM.

THE statement of progress in the British Museum for the year ending March 31, 1902, has appeared. The grand total number of visits to the Museum in the year 1901 was 718,614. This is an increase of more than 29,000 on the total of the year 1900, which was 689,249; and that total, again, was an increase of more than 25,000 on that of the previous year. The number of visits of students to the reading-room has risen to 200,035, as against 198,566 in 1900; a daily average of 664. In the several departments other than the reading-room there has been a further increase in the number of visits of students, the total last year being 57,943, as against 56,043 in 1900. The departments of prints and drawings and of coins and medals have been more frequented, but there has been a decline in the number of students drawing in the sculpture galleries.

Improved electric alarm circuits have been installed both within and without the building. The condition of the wooden floors in the public galleries has called for serious attention, the former system of scouring with water and cleansing fluids having caused the surfaces to decay very considerably. Several of the floors have now been refaced and are treated with polish, washing with water being thus superseded. This system will be extended to the wooden flooring throughout the building. Not only will the flooring itself be better preserved, but there will also be less accumulation of dirt and dust, with resulting benefit to the collections.

Important Egyptian antiquities from very early graves at Abydos have been presented to the Department of Egyptian and Assyrian Antiquities by the Egypt Exploration Fund, and the Department has also acquired by purchase numerous other antiquities of the same character. It has also secured a further considerable collection of tablets from Babylonia of a very early period, including documents in the Sumerian as well as in the old Babylonian language.

Among the acquisitions are a false door from the tomb of Ka-nefer, son of King Seneferu. The deceased was a priest who was attached to the service of the tomb of the king, his father; fourth dynasty, about B.C. 3766; a limestone door from the tomb of Qar, a high official who flourished in the fourth dynasty, about B.C. 3600; a limestone false door from the outside of the tomb; a small false door from the interior of the tomb; a false door in limestone from the tomb of Behenu, the wife of the official Qar; a large limestone stele made for Puherua, a scribe who flourished under King Sekhem-ka-Ra. This stele is the largest and most important of the known monuments of the thirteenth dynasty, the period to which it is probably to be assigned, about B.C. 2100.

The Assyrian antiquities have been enriched by a collection of 2,800 tablets from Lower Babylonia. They were inscribed during the period of the rule of the kings of the second dynasty of Ur, about B.C. 2500 to 2300, and of the kings of the first dynasty of Babylon about B.C. 2300 to 2050. They include a number of interesting commercial documents and contract tablets, which are written in the Sumerian and the Old Babylonian languages. There is also a clay cylinder of Nebuchadnezzar II, king of Babylon from B.C. 604 to 561; it is inscribed with an account of his building operations.

Among the additions to the Greek and Roman antiquities are a silver vase with chased design of lotus-leaves round the body. The character of the work is Græco-Egyptian, probably of the age of the Ptolemies. A bronze statuette of Athena Parthenos; a provincial copy of the statue by Phidias; the right hand is extended, the left hangs by the side; she wears helmet, peplos and ægis.



Mr. Henry Vaughan has bequeathed a fresco painting representing Bacchus standing to the front among vine branches; he wears a lion's skin and holds a wine-cup in his right hand. At his feet is a panther. The uppermost layer of the fresco consists of fine plaster, which has been polished into a very hard surface, like stone. On this surface the design has first been grounded in fine plaster; then upon this plaster ground the inner drawings and all details have been put on in colours mixed with a medium which would burn the colours into the plaster, as in ordinary fresco. This painting was exhibited in Paris in 1866, and was engraved in the "Gazette des Beaux-Arts" for that year. It then belonged to M. Delange, and was supposed to come from Pompeii. The exact provenance is unknown.

The acquisitions of British and Mediæval antiquities include a dug-out canoe, made from a tree trunk, found 6 feet deep on a former bank of the river Lea, during excavations for Lockwood Reservoir, Higham Hill, Walthamstow, given by Messrs. S. Pearson & Co., Ltd., and the East London Waterworks Company. A bronze lamp in the form of Silenus seated on a wineskin, resembling one already in the Museum from the Continent, found in Fenchurch Street, City of London, and was given by "the Friends of the British Museum." An important addition has been made to the continental series illustrating the late Celtic or early British period in these islands, by the purchase of the Gaulish collection of M. Léon Morel, hon. F.S.A., of Rheims and formerly of Châlons-sur-Marne. Hitherto the Museum has been unable to acquire more than a few isolated specimens of this period from abroad, but is now in possession of a fairly complete representation of the civilisation of north-east France from the palæolithic age to the Carolingian period. A large collection of stone implements, including some striking specimens from the drift and relics from neolithic graves and factory sites, illustrates the early phases of human life in north-west Europe, and by inference in Britain, both before and after our country became detached from the Continent. Of the bronze period there are swords with wide chapes of a type barely represented in the Museum; also a number of celts and bracelets, some of which are highly decorated. But the most valuable part of the collection comprises many rare and richly ornamented articles of bronze, ranging in date between 400 and 250 B.C. A red-figured kylix of the late Greek period and a large Etruscan oinochoë with gold decoration from a grave at Somme Bionne, Dept. Marne, where a warrior had been buried on his chariot, furnish a central date for this important series, which has already been published with an album of coloured plates, under the title of "La Champagne Souterraine" (Rheims, 1898). A large and representative collection of Gaulish pottery serves to illustrate the connection between the dwellers on the Marne and the Britons of the corresponding period, and at the same time to emphasise differences in detail between the population on either side of the Channel. The abundant and well-preserved pottery of the Gallo-Roman period forms another section of the Morel collection, and will be temporarily exhibited in this department. Besides a large number of minor objects, there is a fine series of glass, two heads from statues of Trajan and Diocletian, and a bas-relief found at the Roman triumphal arch still standing at Rheims. A leaden coffin of a child illustrates the funeral furniture characteristic of this time. The Merovingian period is also well represented by a complete series of sepulchral vases and a variety of brooches and other ornaments, including a rare and massive buckle of crystal, and a complete burial of a warrior has been preserved intact.

Another part of M. Morel's collection consists of 683 ancient Gaulish coins, comprising the issues of more than sixty different tribes and communities of Gallia Narbonensis, Lugdunensis, Belgica, &c., many of them uninscribed, and therefore classified under the localities in which they are repeatedly found, but some of them bearing inscriptions recording the names of various local chiefs and kings.

The department of coins and medals has obtained among many additions a silver stater weighing 185 grains, of the finest period of Greek art, the middle of the fourth century B.C. This coin is unique and one of the most beautiful examples of Peloponnesian work which exists on coins. The head of the goddess on the obverse is quite equal to that of Artemis on the contemporary stater of Stymphalus, and the form of the elaborate earring on the two coins is identical. On the reverse is Zeus seated on a throne, the arm of which is supported by a small sphinx. From his outstretched right arm he lets fly an eagle, and with his left he leans on a sceptre. In the field before him is a crested helmet, and behind the inscription ΑΧΑΙΩΝ, the letters of which seem to have been separately punched into the die. The type of Zeus letting fly an eagle is clearly an adaptation of the Zeus Lycaeus on the earlier coins of the Arcadians. There can be no doubt, therefore, that this beautiful coin belongs to the earlier Achæan federation, of which the famous Achæan league, formed in 280 B.C., was a revival. The historical value of this coin is very great, as it

proves that the Achæan communes, like the Arcadian after the battle of Leuctra (371 B.C.), combined to strike money in the name of the entire people.

The geological department has been presented with a series of mammalian remains from excavations for new Government buildings, Westminster, comprising human frontals, a human mandible, molar of *Elephas primigenius*, antler of *Rangifer tarandus*, part of skull of *Bos longifrons*, skull and mandible of *Equus caballus*, skull of *Capra hircus* and various other bones. Mr. W. F. Stanley has given a mandible of *Equus caballus* found in undisturbed gravel beneath 10 feet of soil at Great Turnstile, Holborn.

## ARCHÆOLOGY IN SUSSEX.

THE second day of the autumn meeting of the Sussex Archæological Society began with a perambulation of Hastings. Under the guidance of Mr. W. V. Crake, says the *Sussex Daily News*, the party walked to Hastings Castle, where Mr. Horace Sands read a paper descriptive of the old ruins. He pointed out the many features of interest, and his accounts were easily followed, as Mr. Dawson had thoughtfully a day or two before had a number of boards specially printed and hung explanatory of the various parts of the interior. The party then moved off to St. Clement's Church, where Canon H. C. B. Foyster very kindly explained the various interesting parts of this building.

Mr. H. Cousins then took the members in hand, and after pointing out several fine old buildings near, conducted the archæologists through the garden of the house of John Collier, who was five times mayor of Hastings in the time of George II. This view was arranged by kind permission of the Rev. W. C. Sayer-Milward. On reaching All Saints Church with its fine chancel arch, and its curious inscription under the tower, the Rev. G. A. Foyster acted as guide, all being delighted with the building. Passing out into All Saints Street, Mr. Cousins led again and pointed out all the curious and historic places of the East End, including the house of Ann Page, the "Queen" of Hastings and the house of the mother of Sir Cloudesley Shovel, the old Hastings Bank, Pelham House, the old Hastings Theatre (Wesley Chapel) and the sole remaining piece of the old Hastings wall. Waggonettes were requisitioned for a drive to Crowhurst, the route being *via* Bohemia, Springfield Road, Hollington Park, Wiltong Farm, over the Crowhurst railway to the church. Here Mr. H. M. Whitley, the hon. secretary, first drew attention to the palings or fence which surrounded the church, pointing out that in ancient times the farmers of the parish usually built it and kept it in repair. Each farmer had his own section (these were shown), and it was usual to find the initials or names of the man cut in the section, a custom not followed at this church.

Mr. E. T. Connold, in a very interesting paper on the Crowhurst yew tree, said the oldest tree was supposed to be the one at Fortingall, Perthshire, Scotland. The age of the Crowhurst yew was said to be 1,300 years. It measured 41 feet in circumference where the roots emerged from the ground; at 3 feet from the level of the ground it was 27 feet in circumference. Its height was about 45 feet. The trunk, which was very gnarled and full of knots, rose for about 8 feet and then divided into five smaller trunks. Two of these were hollow, a third partially so, and another quite dead and much broken. The upper portion of the fifth appeared to be dead, and was upheld by stout iron bands which passed around the trunk. Another was also prevented from falling by similar bands, and, were it not for their support, considerable portions would fall away. But in spite of all this the tree was in good health. Within the trunk was an irregularly-shaped cavity about 8 feet high, and large enough to contain one adult and three children. The stoutest limb branched off on the south side of the tree. It was 30 feet long, and supported by a massive prop. Another limb, which was 25 feet long, grew from the opposite side of the trunk. These measurements, together with the diameter of the trunk, showed that the boughs covered a space 64 feet in diameter. They would all probably notice how plentiful were the small bunches of contorted leaves at the termination of hundreds of the lesser twigs. These were the well-known yew-tree galls, and were caused by the larvæ of a fly named *Cecidomyia taxi*. Attention was called to the fact that while this tree was very much affected, the foliage of the other three yew trees was comparatively free from the insect.

A remarkable coincidence was then alluded to. In the county of Surrey there was a village named Crowhurst, and the church in that village was dedicated to St. George, as is also the church near which the party were standing. Furthermore, there was also in the churchyard at Crowhurst, Surrey, a venerable yew tree which was considered to be about 1,200 years old, and although rather larger at the base than the Sussex one, it was not so great in girth at 6 feet from the ground nor so high. The speaker dwelt at some length on the



reasons given for the yew being planted in churchyards, and mentioned several as follows:—(a) For its better protection; (b) because it was held sacred for the purpose of making bow staves for warriors (yew was not allowed to be exported, a foreign stave costing 6s. 8d., and English yew 2s.); (c) to protect the church from storms; (d) as a substitute for cypress. To the speaker's mind the most reasonable was the explanation of Collins, that "our forefathers were particularly careful in preserving this funereal tree, whose branches it was usual for mourners to carry in solemn procession to the grave, and afterwards to deposit them under the bodies of their departed friends."

After a vote of thanks had been passed to Mr. Connold, Mr. Whitley, speaking of the church, said there was little of interest in the building with the exception of the tower, which was a fine example, and on it he pointed out the famous Pelham buckle. The church had been rebuilt in 1794 and in 1857, and was a brilliant example of how not to do things. Turning to the old Manor House below, a visit to which was made by permission of Captain Papillon, Mr. Whitley said it was one of the most interesting examples of Domestic architecture in Sussex. There was, he said, probably a doorway in the south wall, and also an entrance to the room above by external stairs. The mouldings were good, and there was a small room over the porch, and a large upper room used for a chapel or oratory. There were two pointed lights, and the hall was divided by wooden partitions or curtains, and there had been wooden buildings around, but these had disappeared. From all he had seen, he came to the conclusion that the place was used by the lord of the manor as a shooting-box. The date was 1250.

The drive was resumed to Hollington Church in the Wood, *viâ* Battle Road, and here Mr. Dawson, called upon unexpectedly, made a few remarks, mentioning that the church appeared in Domesday Book, and that the register dated back from 1636. He made known the interesting fact that Mr. Hamilton Hills, who had devoted time to discover to whom the church was dedicated, had good grounds for the belief that it was to St. Oswald, the popular belief in Hastings and among many archaeologists being that it was dedicated to St. Leonard. There was little of interest in the church for them beyond the sealed-up door, two windows and the remains of an octagonal font, but the place was a favourite spot for tourists. Mr. Dawson recounted the legend that the devil endeavoured to stop the building of the church, but was beaten, and so he caused a great wood to grow to hide it. But, added the speaker, man came along and cut the wood down, unfortunately for the beauty of the situation. The homeward journey was then commenced.

### SWANSCOMBE CHURCH.

SAD havoc has been caused to Swanscombe parish church, one of the oldest, if not the oldest, of ecclesiastical buildings in Kent, says the *Daily Telegraph*, by the extraordinary thunderbolt which struck and set alight the woodwork of the spire. Despite heroic efforts to combat the flames, the tower and nave were laid in ruins. Only the chancel remains, with the blackened walls of the nave, to which the charred roof-beams still cling. The shingled octagon spire which surmounted the square tower, with its six eighteenth-century bells, has disappeared, and the precious Norman font of solid chalk stone, said to have been damaged by Cromwell's soldiers, is shattered. With difficulty the church registers, dating back to 1549, were rescued in a sadly battered condition. Only thirty years ago the building was restored by Sir Erasmus Wilson, and although the much more formidable task now presented will doubtless be vigorously undertaken, the parishioners, as well as the wider circle of ecclesiologists, cannot but regard with grief the destruction of a fabric which has been treasured for centuries. Curiously enough, the church was struck by lightning just a hundred years ago—on Whit Tuesday, 1802.

Swanscombe is said to be the only Anglo-Saxon church in Kent. The actual consecration as a place of worship of this picturesque height, commanding a wide view of the Thames estuary, is indeed lost in the mists of time. There is said to have been a church of some sort there as early as the sixth century. Dr. Thorpe identified the place as the *Vaginacæ* of the Romans. Certain traces of these invaders are to be found in the neighbourhood. Some years ago a copper coin of Nero was dug from under a hedgerow in the parish, and another, of Severus, was turned up by the plough. The name Swanscombe is believed to be derived from that of Sweyn, who, sailing up the Thames, is said to have landed where Greenhithe now stands. But this and much more of the "history" of Swanscombe must remain mere tradition. It is not apparently known when the present church, which is dedicated to St. Peter and St. Paul, was founded, but the round-headed window in the south side of the tower, supposed to be of Saxon workmanship, is ascribed to the time of Edward the Confessor.

A familiar tradition claims Swanscombe as a shrine of St. Hildeferth, to which came many pilgrims to invoke the aid of the saint in the cure of madness. Lambard, in his "Perambulation of Kent," 1570, has the following:—"The church at Swanscombe was much haunted in times past, for Saint Hildeferth's helpe (a bishop, by conjecture of his picture yet standing in the upper window of the South Ile, although his name is not read in all the Catalogue of the Saxons), to whom such as were distracted came for restitution of their wits, as thicke as men were wont to saile to Anticyra for Heleborus. This cure was performed here by warmth, close-keeping, and good diet, means not only not strange or miraculous, but meer naturall, ordinary and reasonable. And therefore, as on the one side, they might truly be thought mad men and altered in their wits that frequented his pilgrimage for any opinion of extraordinary working, so on the other side Saint Hildeferth (of all the saints that I know) might best be spared, seeing we have the keeper of Bethleem, who ceaseth not, even till this day, to work mightily in the same kinde of miracle." More than one authority testifies to the crowds of pilgrims, and in "Jottings of Kent" mention is made of a stained-glass window in the south side, containing a picture of the saint, decked in the vestments of a bishop.

According to another tradition, it was in the vicinity of Swanscombe that the resolute men of Kent, carrying green boughs after the manner of the Scots at Dunsinane, wrested from William of Normandy the recognition of their ancient rights and privileges. For centuries the living has apparently been an appendage of the manor of Swanscombe, but mention is made of a dispute in the reign of Henry III. between the Prior of St. Mary's, Southwark, and Warine de Montchensie, concerning the advowson and right of presentation.

Within the church are the tombs of various members of the Weldon family, including Sir Ralph Weldon, "Chiefe Clarke of the Kitchin to Q. Elizabeth, and afterward Clarke Comptroler to King James, and dyed Cla: of the Grenclouth on the 12th of November, in the yeare 1609." Sir Ralph's grandfather "served King Henry 7, and was Mr. of the Household to King Henry 8," and his son Anthony is the author of "Memoirs of the Court of James I."

The rector, the Rev. George Hale, in appealing for funds says:—"The church is one of very considerable archaeological value. A church existed at Swanscombe as early as the sixth century, and the present structure is said to be the only Anglo-Saxon church in Kent. The tower is probably Transition Norman, and there are a number of flat Roman tiles built into it, standing as it does close by the old Watling Street. In the lower part of the tower is a double-splayed window, ascribed to the time of Edward the Confessor. The chief portion of the fabric is Early English with later insertions. The church was once frequented by pilgrims, who came to invoke the aid of St. Hildeferth for the cure of insanity—a Bishop of Meaux, born in 607, who died in 660, and in whose honour the collegiate church of Gournay is dedicated. The saint was represented in a stained-glass window, of which a small portion still remains in the south aisle. This window has, fortunately, escaped the fire. The wall of the south aisle also shows the steps leading to a rood-loft, and there are also in the church three ancient piscinæ and an aumbry, or, as some say, a leper's window closed on the outside. Part of a fine carved-oak rood-screen, which had been placed across the arch of the tower, has been, unfortunately, destroyed by the fire; also the rare Norman font formed out of a block of solid chalk and carved with the emblems of the four Evangelists has been shattered. But this, it is hoped, may be fitted together again, as the fragments have been carefully preserved, and the most valuable piece of carving is still intact. The work of restoration has been entrusted to the architect who restored the church in 1874, Mr. Jabez Bignell, a pupil of Sir Gilbert Scott, who spoke of the restoration as "a most careful and successful piece of work." According to his report, sent in to-day, the chief work to be done is a new nave roof, most of the north and south aisle roofs, new wood spire and floor to the tower, also the reseating of the nave and aisles, with repairs to the stonework and fabric generally, and possibly the rebuilding of the upper portion of the tower in addition to a set of new bells. The latter is perhaps the saddest loss of all to the neighbourhood. The six bells of Swanscombe were famous throughout Kent, three of which were cast in 1751. The cost of restoring the building to its original appearance, including new bells, he estimates at about 4,000*l.* The church was insured in the Ecclesiastical Insurance office for 2,550*l.*, including chancel and organ, which have suffered to a comparatively slight extent. I should mention that the lightning conductor had been examined, as it happened, a few days before in the course of some repairs by the churchwardens, and appeared to be free from any defect. But the lightning appears to have struck the wooden-shingled spire, and the whole structure was observed to be blazing furiously a few moments afterwards. Every effort was made by the local fire brigade, who were on the spot almost immediately. But the men were handicapped by the



low pressure of the water obtained from the Kent Waterworks hydrant, which made it impossible to send a jet as high as to reach the top of the tower. The church plate, including a chalice of 1620, is safe. The registers, dating back to 1559, have been taken from the safe, which was exposed to the fire for some hours before it could be rescued, and placed in the hands of experts, much damaged, but not destroyed.

## TESSERÆ.

### Influences on Art.

IN every age art has been the embodiment of either the democratic, religious or aristocratic idea; that is to say, the people, priestcraft and rulers, have alternately given it direction. The style and thought of the various schools which have arisen among the several nations that have developed art will be found to be characterised in a great degree by the prevailing sentiment of their era, varying in choice and treatment of subjects according to the fluctuations of morals and education. At no time has art been entirely free. Perhaps it is too much to expect that it will ever wholly liberate itself from human prejudice or infirmity and rise to its legitimate position of an incorruptible teacher of truth and expounder of beauty. The utmost that can be rationally hoped for it is that good taste may be so diffused as to create a demand for excellence and a prompt rejection of artifice. Great minds only can so impress the common mind as to lead it steadily forward in the road of good taste. Their task is a gigantic one, owing to the eccentricity of popular impulses and the diligence of weaker minds, who, not content with being wrong themselves, are ever striving to draw others after them. Yet with all these drawbacks, we constantly see in art signs of promise. Her struggles are incessant to escape from the snares in her path, and her progress, as a whole, may be said to be onward. Every lofty development of genius in schools becomes a stimulus to greater exertion. It is true many ages may yet pass before certain past excellence is again rivalled, but the standard it creates fixes itself indelibly upon the human mind, which contents itself permanently with nothing inferior. Whatever degree of perfection in their particular studies Classicalism arrived at we seek for; so of Mediævalism. Thus modernism has the threefold advantage of possessing not only her own artistic energies and aspirations, but also the experience and progress of those two great eras of art. Schools of art had their origin in individual talent, fostered by public patronage to a degree which exalted the private taste or particular excellence of the artist into a rule, as it were, for his immediate neighbourhood or generation. They have all been more or less partial in their scope owing to the particular direction given to the genius of their founders which continued to affect their pupils until an equal or superior mind arising, forced the bias of his own method upon his generation, and thus modified the old or created a new school.

### The Porch in Architecture.

The only known instance of a porch in Greek architecture is that in the octagonal structure called the Tower of the Winds, or that of Andronicus Cyrrhestes, which has a small prostyle portal on two of its faces, north-east and north-west, each consisting of a simple distyle, or two columns and their entablature, surmounted by a pediment, and which therefore may be regarded as the prototype of those ornamental compositions for doors and windows so greatly affected in Italian architecture, which present a microstyle application of the orders, that is, small columns adapted not to the entire structure, but to subordinate parts of it. When portico fronts were laid aside, as partaking too much of the previous Pagan temple; when columns began to be not only attached to the building, but employed as microstyle decorations to its different external stages or storeys, often very irregularly and generally connected together by arches—in short, when the Roman style was transformed into and superseded by the Byzantine and the Lombardic styles, porches began to be important features, subordinate indeed in size to the structures to which they were attached, but principal in regard to embellishment, being frequently composed of groups of small columns elaborately wrought, and some of them often placed on the backs of lions or other animals, and supporting a series of concentric arches or arch-volt mouldings equally enriched. Here microstyle embellishment may be said to have been carried to such a height as to be ultimately lost sight of; the columns became at length mere subsidiary members and a combination of vertical mouldings or shafts cut out of the receding angles constituted the general splay of the whole portal, which was thus extended in appearance ad libitum, without regard to the size of the actual doorway or aperture itself, a very important advantage as regards design. In the Norman Gothic style the porches or portals are little more than a modification of the similar features in Byzantine and Lombardic architecture. Of porches, however,

strictly so called, that is, portals projecting out from the edifice so as to form a sheltered external vestibule, we have few Norman instances, and those do not occur in the principal front, but at the sides of buildings. The same also is the case in Gothic architecture, where, though we often meet with spacious and magnificent portals, especially in continental examples, we do not find advanced porches brought out beyond the general plan of the building in front; the porch being there almost invariably enclosed within the lower part of the structure, even where it may be said to project with respect to that part of the front which is seen above it, but on a different plane, as, for instance, in the front of Westminster Hall, Winchester Cathedral, &c., although in those cases the entrances are placed rather within deep recesses than porches. In church architecture entrances of the last-mentioned kind hardly ever occur at the west end or front, but were frequently made very conspicuous features in the side elevations, of which we have striking instances in the beautiful north porches at Salisbury and Wells cathedrals, both of which advance out very considerably.

### Norman Architecture.

A grand simplicity in the form and figure of Norman buildings is one of the most striking and important distinctions of this species of architecture. Its long-drawn parallel lines are very rarely interrupted by prominent members in a transverse position, and the smaller features, such as buttresses and cornices, only sparingly break in upon the monotony of the surface. A turret with a pinnacle, rigid in shape, might sometimes be allowed to distinguish the extreme angles, but the parapet which crowned the wall was never divided in its extent by an embrasure or any kind of ornament. The plain figure on outline here described might contain many windows and many mouldings, and numerous sculptures might be required to complete the design, but simplicity and parallelism in the essential masses constituting the plan of the building were its necessary and approved features. The buttresses of a later period stood forward on a bold base and retreated to their summits in fleet lines and at regular intervals; those of Norman architecture were added to the substantial walls—were made to preserve a direct line from top to bottom, or to diminish their substance so slightly as to be considered no material departure from the severe and somewhat stiff character of the style. Yet this may be regarded as the prototype of the beautifully ornamental buttress of the thirteenth century; they who invented the design left to others the merit of bringing it to perfection. Norman architecture possessed height, extent and variety of embellishment, and an unbroken, or only an occasionally broken, superficies was its common and decided characteristic. Applying these remarks more particularly to Domestic architecture, it will be observed that while its specimens often exhibit very rich and handsome varieties of sculpture, the constituent features of the external design are few and rarely stand in advance of the main wall. Thus it appears that this style was always distinguished by broad and large masses, and it is doubtful whether the straight line of the roof was ever embellished with more weighty ornaments than the chimneys, which, with few exceptions, were cylindrical, tall and very graceful.

### Greek Painting.

There is a general prejudice against the opinion that the painting of the Greeks equalled their sculpture, and the earlier discoveries of the remains of ancient paintings at Pompeii and Herculaneum tended rather to increase this prejudice than to correct it. The style of the paintings discovered in these cities was condemned both by Pliny and Vitruvius, and yet almost every species of merit may be discovered in them. What, therefore, must have been the productions which the ancients themselves esteemed their immortal works, and which singly were estimated equal to the wealth of cities? These remains of Pompeii and Herculaneum induced Sir Joshua Reynolds to form a decided opinion upon ancient painting. He remarks:—"From the various ancient paintings which have come down to us we may form a judgment with tolerable accuracy of the excellences and the defects of the arts amongst the ancients. There can be no doubt but that the same correctness of design was required from the painter as from the sculptor; and if what has happened in the case of sculpture had likewise happened in regard to their paintings, and we had the good fortune to possess what the ancients themselves esteemed their masterpieces, I have no doubt but we should find their figures as correctly drawn as the Laocoon, and probably coloured like Titian." This opinion has been further confirmed by later discoveries at Pompeii, especially by the great mosaic of the Casa del Fauno discovered in 1831, supposed to represent the battle of Issus. But the beauty of ancient sculpture alone is itself a powerful advocate in favour of this opinion, for when art has once attained such a degree of excellence as the Greek sculpture evinces, it is evident that nothing mediocre or even inferior could be tolerated. The principles which guide the



practice of both arts are in design and proportion the same, and the style of design in painting cannot have been inferior to that of sculpture. Several of the most celebrated ancient artists were both sculptors and painters: Phidias and Euphranor were both; Zeuxis and Protogenes were both modellers; Polygnotus devoted some attention to statuary; and Lysippus consulted Eupompus upon style in sculpture. The design of Phidias and Euphranor in painting cannot have been inferior in style to that of their sculpture, nor can Eupompus have been an inferior critic in his own art than in that of Lysippus. We have besides the testimony of nearly all the Greek and Roman writers of every period, who in general speak more frequently and in higher terms of painting than of sculpture. The occasional errors in perspective detected in some of the architectural decorations in Pompeii have been assumed as evidence that the Greek painters generally were deficient in perspective. This conclusion by no means follows, and is entirely confuted by the mosaic of the battle of Issus, in which the perspective is admirable; in many other works also of minor importance the perspective has been carefully attended to. We know, moreover, that the Greeks were acquainted with perspective at a very early period, for Vitruvius says that when Æschylus was teaching tragedy at Athens Agatharcus made a scene, and left a treatise upon it. By the assistance of this Democritus and Anaxagoras wrote upon the same subject, showing how the extension of rays from a fixed point of sight should be made to correspond to lines according to natural reason, so that the images of buildings in painted scenes might have the appearance of reality, and although painted upon flat vertical surfaces some parts should seem to recede and others to come forward. This class of painting was termed scenography by the Greeks, and appears to have been sometimes practised by architects. Clithenes of Eretria is mentioned as architect and scenographer. Serapion, Eudorus and others were celebrated as scene-painters. Scene-painting was perhaps not generally practised until after the time of Æschylus, for Aristotle attributes its introduction to Sophocles.



#### Heriot-Watt College, Edinburgh.

SIR,—In your article on the "Heriot-Watt College, Edinburgh," reference is made to Callimachus as the poet of the hymn to Zeus, but I venture to suggest that it was Cleanthes, the third of the early Stoic teachers, who drew water by night for his gardens and studied philosophy in the day, and to whom we are indebted for the profound and majestic hymn to Zeus which in the opinion of Professor Mahaffy "would alone redeem the Hellenistic age, as it stands before us, from the charge of mere artificiality and pedantry."—Yours obediently,

J. T. RAWLINGS.

152 Milkwood Road, Herne Hill, S.E.:  
August 18, 1902.

#### GENERAL.

**The Memorial** to Her late Majesty Queen Victoria, to be placed in the church of St. Mildreds, Whippingham, by His Majesty King Edward, will consist of a reredos, clergy seats, communion table, marble floor to the chancel, &c.

**A New Church** is being erected at Haslemere, one of the most beautiful parts of the county of Surrey. The architects are Messrs. Spooner & Cobbold, of 17 Red Lion Square, Holborn.

**The Earl of Rosebery**, it is anticipated, will shortly open the new technical schools at Leamington.

**The Authorities** of the Sheffield University College have adopted a site at Western Bank for the new university buildings, the technical department remaining at St. George's Square. The estimated cost of the scheme is 53,000*l.*, of which 48,000*l.* has been promised.

**The Result** of the examination of the University Extension Lectures on the History of Architecture, held at the Chelsea Polytechnic last session, has just been announced as follows:—J. G. Wiles (certificate of distinction), G. Wilson (certificate of distinction), A. C. Goulder (certificate of distinction), H. Stewart, J. Henry, R. Crosthwaite, E. Heath, G. Gifford, A. Cooke, F. Hedges, H. Hèlin, E. Fowler, E. Topping. The lecturer was Mr. Banister Fletcher, A.R.I.B.A., and the examiner was Professor W. R. Lethaby, of the Royal College of Art. The lectures will be continued next session, the first being given on Monday, October 6, at seven o'clock.

**The Competition** recently held for the London Baptist Association church, Mitcham Lane, Streatham, S.W., has been

decided in favour of the design marked "New Era," the authors being Messrs. G. Baines & R. P. Baines, 5 Clement's Inn, Strand. The first portion of the buildings, which includes the nave, tower, vestries and temporary apse, is to be at once proceeded with. The estimated cost of the complete block is 5,238*l.*, without tower, the latter being 440*l.* extra.

**The Foundation-stone** has been laid of an obelisk which is to be erected on Plymouth Hoe as a memorial of Prince Christian Victor and the West-country soldiers who fell in the war. The memorial, which is of granite, is 43 feet in height with bronze panels on each of its four sides. One of these, by Mr. Emil Fuchs, is dedicated to the memory of Prince Christian Victor, while the others, by Mr. Onslow Whiting, depict the charge of the Devons at Waggon Hill and the Gloucester and Somerset Regiments in action.

**M. Ernest Dubois** has completed the statue of Bratiano, the Roumanian hero, which is to be erected in Bucharest.

**Mr. George Harry Pownall** (erroneously described in the Probate Registry Calendar as George Henry Pownall), of 83 Onslow Square, and formerly of 29 Parliament Street, architect, has left property valued at 26,278*l.* 6*s.* 1*d.* gross, 25,501*l.* 19*s.* 4*d.* net.

**Professor Uphues**, the sculptor, will go to America at the Kaiser's wish, and superintend the erecting of the statue of Frederick the Great which His Majesty has presented to the City of Washington.

**Mr. Francis Williamson**, sculptor, Esher, has been commissioned to execute three colossal bronze statues of the late Queen Victoria for the North-West Provinces, India. At present he is engaged on one of the late Sir George Grey, for Auckland, New Zealand.

**A Considerable Portion** of the old Wear music hall, Drady Lane, Sunderland, collapsed last week. The building, which is of large proportions, has not been used as a place of amusement for many years. There is a spring of water under the hall, and the foundations had evidently become undermined.

**The St. Petersburg Novoe Vremya** states that there exists in Russia an exact replica of St. Mark's Campanile. It was built about 130 years ago by the Empress Catherine II., and crowns the convent at Narechta, in the Government of Kostrowa.

**Signor Boni**, to whom has been entrusted the work of clearing away the ruins of the Campanile at Venice, states that there need be no question as to the possibility of rebuilding the structure. The foundations are all intact, and the work can be completed in five years at a cost of 5,000,000 lire. Of this sum 1,500,000 lire has already been subscribed, and the balance will be found by the Italian Government if necessary.

**The Cathedral** of Gothenburg has fallen into so dangerous a condition, it is likely to be demolished.

**A Full-sized Model** of the Sphinx is soon to be brought from Paris to London, where it will be placed on exhibition. The work was carried out by Madame Longworth in two years.

**A National Memorial** is to be erected in Adelaide to commemorate the South Australians who have been engaged in the South African campaign. It is likely to take the form of a mounted trooper, and a model has been prepared by Mr. Adrian Jones which has met with approval both in London and Adelaide.

**The Society of Arts** will next year offer the usual prizes for designs of furniture in connection with the Owen Jones Memorial Fund.

**A Committee** of the Royal Academy, with Sir Edward Poynter as chairman, have undertaken the organisation of the British section of Fine Arts in the St. Louis Exhibition of 1904. There will also be an educational exhibition arranged by the Board of Education.

**The American National Academy of Design** will henceforth be open to students, who will pass a preliminary examination, without the payment of any fees. Larger endowments will have to be made by the State to uphold the various schools.

**The Parish Church** of St John the Baptist at Little Marlow, Bucks, portions of which date from the year 1190, is being restored. The tower is acknowledged as being among the finest examples of Norman architecture in the county. It has, however, been pieced with friable and broken stucco to such an extent that its appearance was rendered somewhat unsightly, while the breaking away of the stonework rendered it dangerous to passers-by.

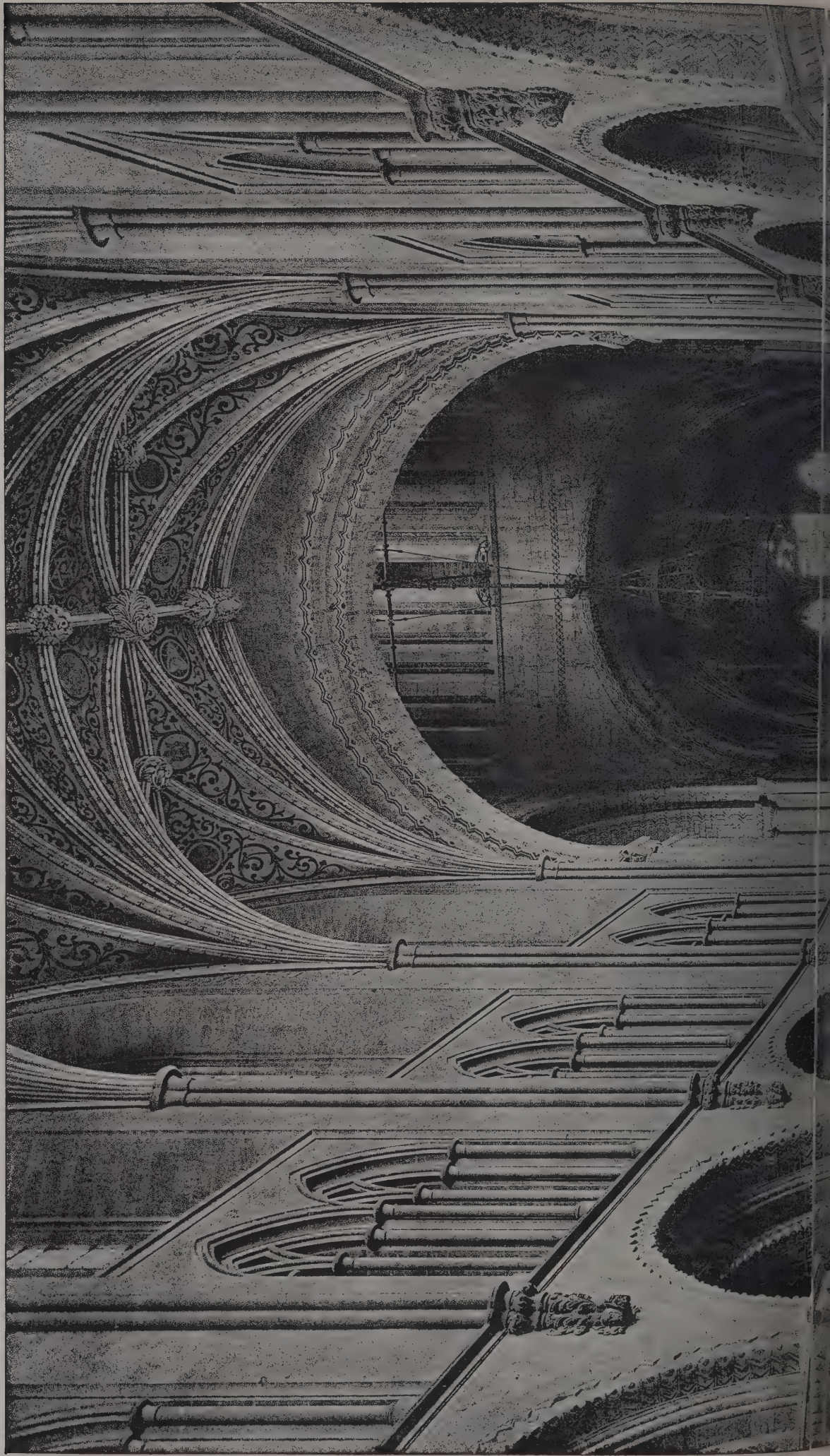
**The Expenditure** at the Liverpool docks during the past year has been 1,315,853*l.* 8*s.* 2*d.* The wages bill has at times exceeded 11,600*l.* per week, and the number of men employed has been upwards of 8,000 at a time. These figures are exclusive of payments to contractors, and do not include the men employed by them.



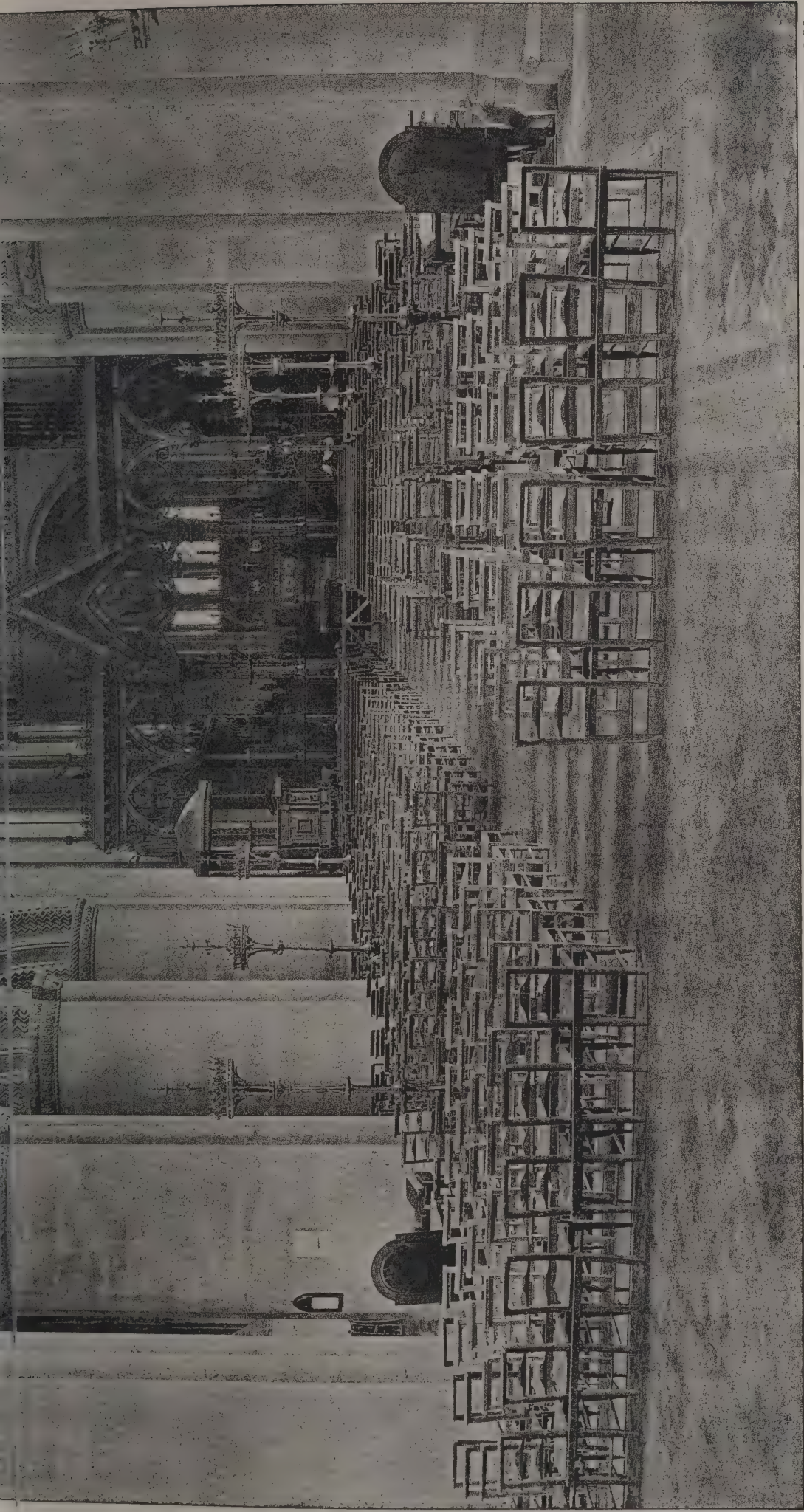




*The Architect, Aug 22 1902.*







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CATHEDRAL SERIES, No. 405.—HEREFORD: THE NAVE.



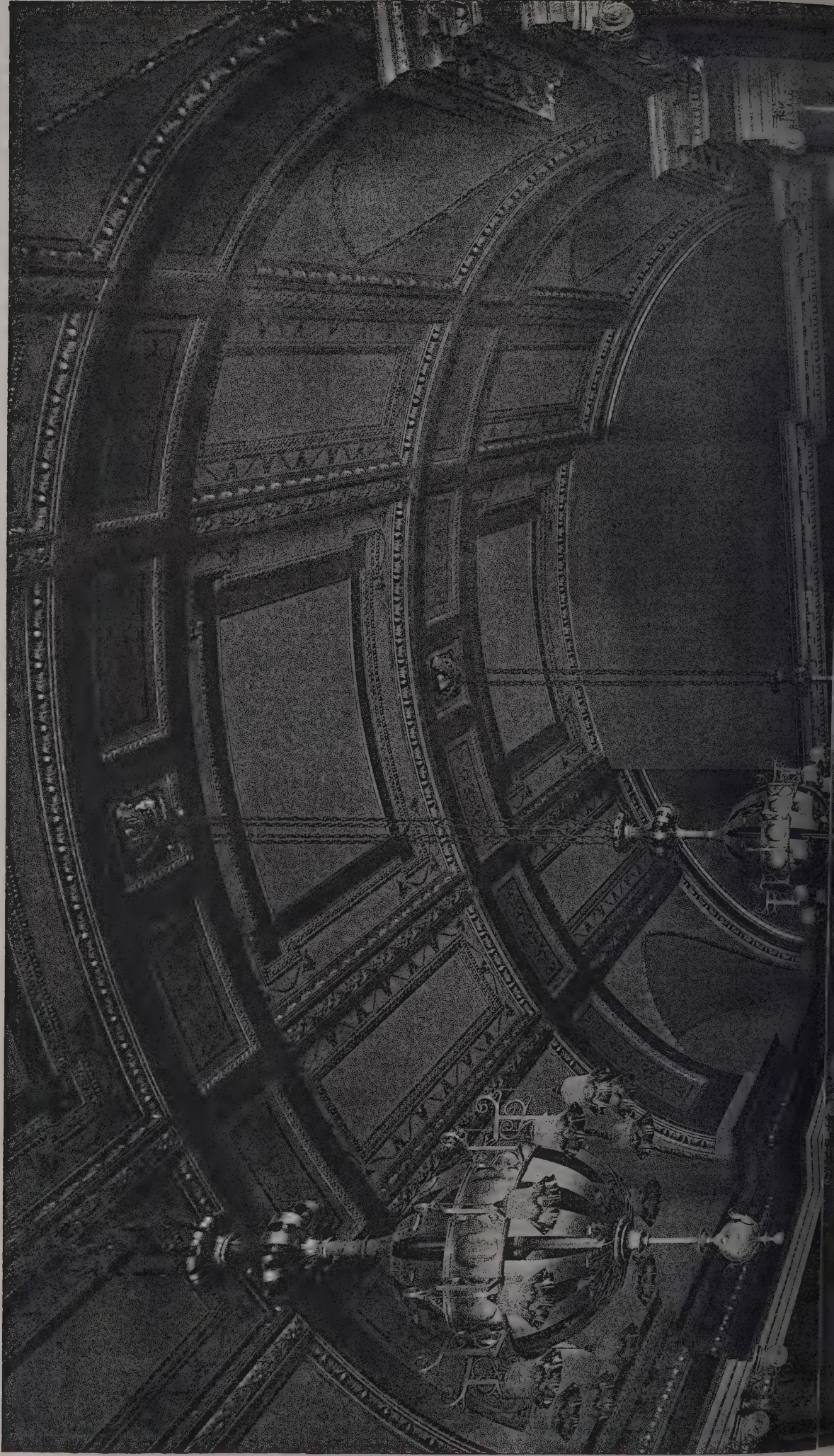








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**BOARD ROOM: LLOYD'S BUILDING, FENCHURCH STREET, E.C.**

T. E. COLLCUTT, F.R.I.B.A., Architect.

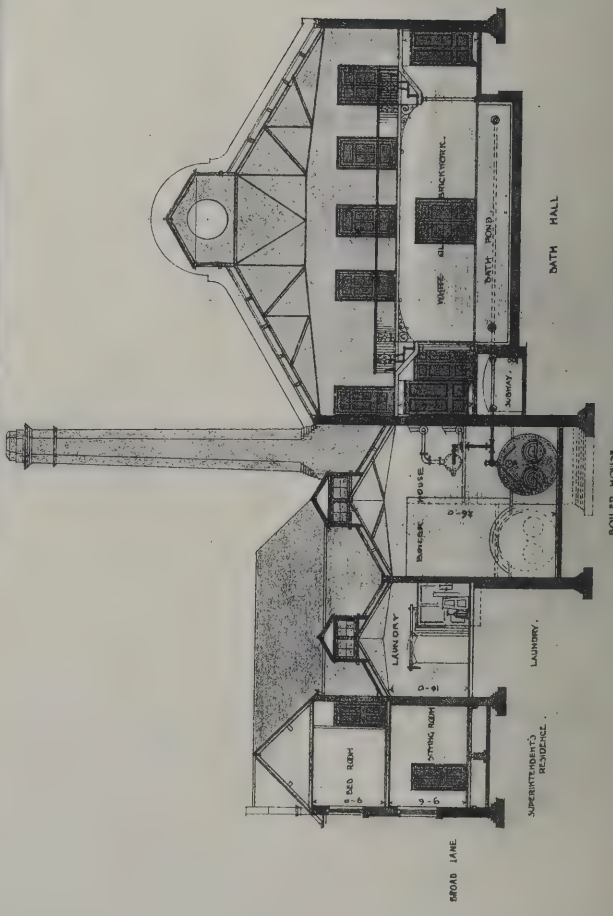




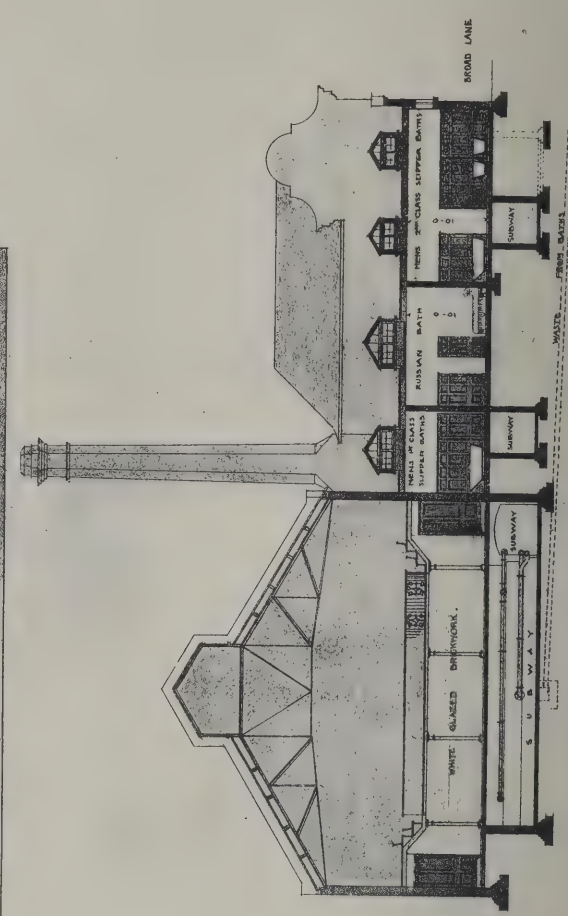








SECTION A.B.

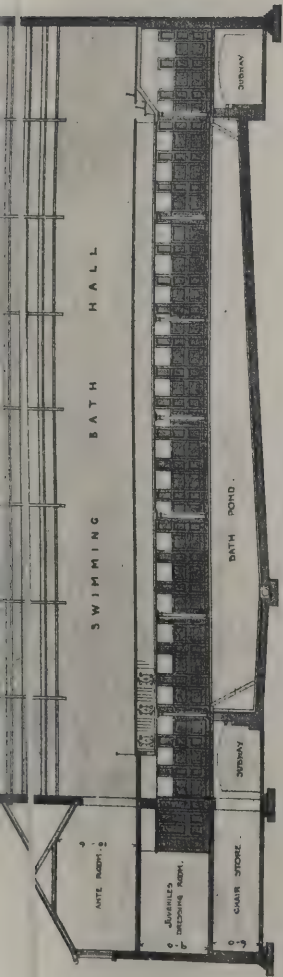


SECTION C.D.

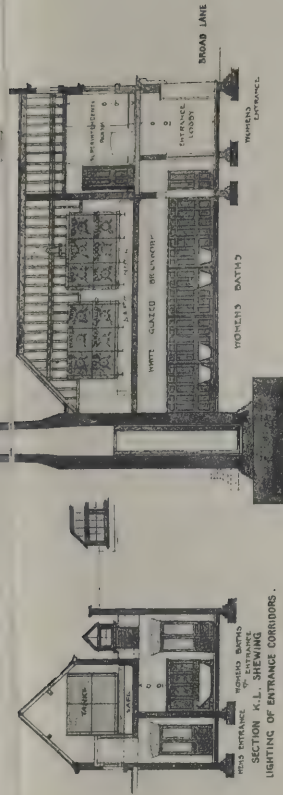


MAIN FLOOR

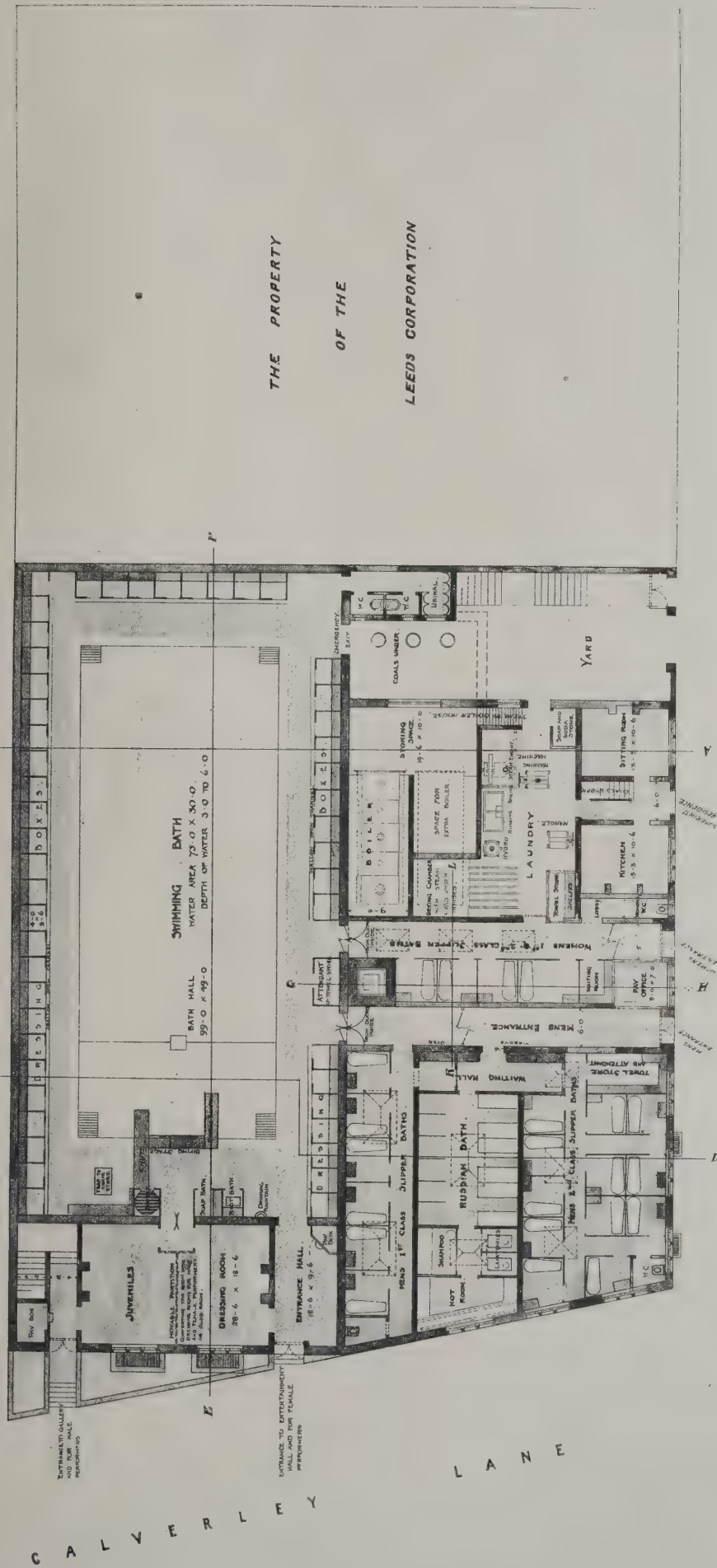




SECTION E.F.



SECTION G.H.



GROUND PLAN.

DESIGN FOR PUBLIC BATHS, BRAMLEY.

By Messrs. BUTLER WILSON, F.R.I.B.A., and OGLESBY.

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THE

**Architect and Contract Reporter.****EDITORIAL NOTICES.**

*In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

**TENDERS, ETC.**

*\*\* As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

**COMPETITIONS OPEN.**

**BERMONDSEY.**—Sept. 16.—Designs are invited for artisans dwellings to be erected on land at Rotherhithe, within the borough of Bermondsey, and known as the Fulford Street area. Premiums of 100*l.*, 60*l.* and 40*l.* will be awarded. Mr. Fredk. Ryall, town clerk, Town Hall, Spa Road, S.E.

**BIDEFORD.**—Sept. 25.—The Town Council of Bideford are about to erect municipal offices and a public library upon a site opposite the west end of the Long Bridge, Bideford, and they invite designs for the proposed buildings. Premiums of 30*l.*, 15*l.* and 10*l.* respectively are offered for the designs which shall be placed by the Council first, second and third in order of merit. Designs and descriptions, &c., are to be delivered to Mr. Wm. B. Seldon, town clerk, 18 The Quay, Bideford.

**DEPTFORD.**—Aug. 30.—Competitive designs are invited for a town hall and municipal offices. Premiums of 100*l.*, 75*l.* and 50*l.* are offered for the three selected designs. Mr. Vivian Orchard, town clerk, Municipal Offices, 20 Tanner's Hill, Deptford S.E.

**INDIA.**—Nov. 1.—Competitive designs are invited for the erection of a memorial to Her Majesty the late Queen Victoria at Allahabad. A premium of 2,000 rupees will be awarded to the design selected by the committee. Mr. H. Nelson Wright, Indian Civil Service, honorary secretary, Queen Victoria Memorial Fund Committee, Allahabad, India.

**LIVERPOOL.**—Sept. 15.—Designs are invited for new labourers' dwellings to accommodate about 2,500 persons, to be erected on the Hornby Street area. Premiums of 250*l.*, 150*l.* and 100*l.* respectively are offered for the first three selected designs. Particulars will be supplied by the Town Clerk.

**MAIDENHEAD.**—Oct. 1.—Designs for free library. Premiums offered of £50, £20 and £10 respectively. Mr. John Kirk, town clerk, Guildhall, Maidenhead.

**SOUTHEND.**—Sept. 7.—Designs are invited for a church to accommodate 500 persons, a clergy-house, and a parochial hall or parish-room about 50 feet by 30 feet. Mr. C. H. J. Talmage, Kathleen Villa, Southchurch Road, Southend-on-Sea.

**SUNDERLAND.**—Aug. 30.—Designs are invited for proposed police and fire-brigade buildings to be erected in Gill Bridge Avenue and Dun Cow Street. Premiums of 100*l.*, 50*l.* and 25*l.* are offered for first, second and third designs respectively. Mr. Fras. M. Bowey, town clerk, Town Hall, Sunderland.

**CONTRACTS OPEN.**

**BAILDON.**—Aug. 28.—For erection of farm buildings and windmill at Ash House Farm, Faweather, near Baildon, Yorks. Messrs. Joshua Robertshaw & Son, architects, 55 Tyrel Street, Bradford.

**BIRKENHEAD.**—Aug. 26.—For erection of offices at the tramways depôt, Laird Street. Mr. Chas. Brownridge, borough surveyor, Town Hall, Birkenhead.

**BLACKPOOL.**—Aug. 30.—For additions to destructor works. Mr. John S. Brodie, borough engineer, Town Hall, Blackpool.

**BOOTLE.**—Aug. 28.—For putting-in the foundations to a datum level of school premises to be erected near Linacre Lane, Bootle, Lancs. Mr. Thomas Cox, architect, 11 Dale Street, Liverpool.

**BRANKSOME.**—Aug. 27.—For construction of a coal-house and executing sundry repairs, colouring, &c., at the isolation hospital, Ringwood Road, Branksome, Dorset. Mr. Samuel J. Newman, Council Office, Branksome.

**BRISTOL.**—Aug. 25.—For erection of school premises at Mina Road, Bristol. Mr. H. Dare Bryan, architect, 38 College Green, Bristol.

**BRISTOL.**—Sept. 10.—For erection at Stapleton of an infirmary for the accommodation of about 875 sick patients. Mr. J. J. Simpson, clerk, St. Peter's Hospital, Bristol.

**BURNHAM-ON-CROUCH.**—Aug. 25.—For erection of an engine-house at the waterworks, Burnham-on-Crouch. Mr. E. Dillway, High Street, Burnham-on-Crouch.

**CARLISLE.**—Aug. 30.—For alterations and additions to house at Devonshire Walk. Mr. Henry C. Marks, surveyor, 36 Fisher Street, Carlisle.

**ENFIELD.**—Sept. 9.—For erection of a deaf centre and additions to the junior mixed and infant departments at the Bush Hill Park school, Enfield, Middlesex. Mr. G. E. T. Laurence, architect, 22 Buckingham Street, Adelphi, W.C.

**FARNHAM.**—Aug. 27.—For erection of two cottages and for providing and fixing fire-escape stairs. Messrs. Friend & Lloyd, architects, Aldershot.

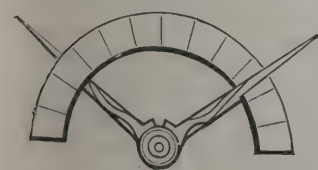
**FEATHERSTONE.**—Aug. 26.—For extension of the North Featherstone Lane Board schools. Mr. W. Hamilton Fearnley, architect, Station Lane, Featherstone, Yorks.

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**GATESHEAD.**—Aug. 27.—For erection of a sneck rubble boundary wall at Saltwell Cemetery, about 430 lineal yards in length. Mr. J. Bower, borough surveyor, Town Hall, Gateshead.

**GLOUCESTER.**—Aug. 28.—For erection of a nurses' home at the Gloucester infirmary. Messrs. Waller & Son, architects, 17 College Green, Gloucester.

**GRAYS.**—Aug. 27.—For raising the top-floor ceilings and cleaning and painting and other works at the *Exmouth* training ship infirmary, Therfield House, Grays, Essex. Mr. T. Duncombe Mann, clerk, Metropolitan Asylums Board, Embankment, E.C.

**GRIMSBY.**—Aug. 26.—For piling, timbering and concreting at the Alderman Dobson school. Mr. H. C. Scaping, architect, Court Chambers, Grimsby.

**GWITHIAN.**—Sept. 6.—For rebuilding the Pendarves Arms hotel, Gwithian, Cornwall. Mr. Horace W. Collins, architect, Walreddon, Redruth.

**HACKNEY.**—Sept. 11.—For erection of coal stores. Mr. George Grocott, town clerk, Town Hall, Hackney.

**HADLEIGH.**—Sept. 3.—For erection of school buildings, Hadleigh, Suffolk. Messrs. Eade & Johns, architects, Cornhill Chambers, Ipswich.

**HALIFAX.**—Aug. 30.—For erection of a dwelling-house at Lee Mount, Halifax. Mr. Medley Hall, architect, 29 Northgate, Halifax.

**HAMPSTEAD.**—Aug. 27.—For erecting a bathroom at the North-Western Fever Hospital, Lawn Road. Metropolitan Asylums Board, Embankment, E.C.

**HARROGATE.**—Aug. 25.—For the excavation and refilling of about 725 lineal yards of trench for an intended line of 7 in. cast-iron pipes, commencing on the south side of the High Bridge, Knaresborough, thence along Waterside, and terminating at a point near the pumping station of the Knaresborough Urban District Council. Mr. Edwd. Wilson Dixon, engineer, 14 Albert Street, Harrogate.

**HONITON.**—Aug. 27.—For the construction of an open concrete storage reservoir, having a capacity of 1,500,000 gallons, filter-beds and covered service reservoir, together with the supply, laying and jointing of about 2,100 yards of 4 in. and 3 in. cast-iron socket pipes, with sluice and air valves, hydrants, &c. Messrs. Beesley, Son & Nichols, engineers, 11 Victoria Street, Westminster, S.W.

**HOVE.**—For erection of a detached house in the new road forming the northern extension of Palmeira Avenue, Hove, Sussex. Messrs. Clayton & Black, architects, 152 North Street, Brighton.

**IPSWICH.**—Aug. 27.—For erection of generating station, offices, car-shed, chimney-shaft and destructor buildings in Constantine Road, Ipswich. Mr. Will Bantoft, town clerk, Town Hall, Ipswich.

**IRELAND.**—For making of turbine foundations and erecting of a turbine-house at Newry. Messrs. Henry Thomson & Co., Newry.

**IRELAND.**—Sept. 8.—For erection of an electric power station, 42 feet by 25 feet, in brick, with steel principals and slated roof, at the Grosvenor Street goods terminus, Belfast, for the Great Northern Railway Company (Ireland). Mr. T. Morrison, secretary, Amiens Street Terminus, Dublin.

**JARROW.**—Aug. 25.—For erection of outhouses at the Monkton school. Mr. T. H. Spencer, clerk, School Board Offices, Jarrow.

**KING'S LYNN.**—Aug. 26.—For erection of a screw pile light beacon on the west bank of the Vinegar Middle Cut, King's Lynn Channel. Mr. W. D. Ward, clerk, King's Lynn.

**LAMBETH.**—Sept. 3.—For construction of conveniences at the junction of Stangate with Westminster Bridge Road, and at Loughborough Junction. Mr. Henry Edwards, borough engineer, Lambeth Town Hall, Kennington Green, S.E.

**LANCASTER.**—Sept. 1.—For taking-down and re-erecting on the new site the steamer shed at St. George's Quay. Mr. T. Cann Hughes, town clerk, Town Hall, Lancaster.

**LANCASTER.**—Sept. 1.—For erection of a wall on St. George's Quay. Mr. T. Cann Hughes, town clerk, Town Hall, Lancaster.

**LEEDS.**—Sept. 8.—For preparing the foundation of the Killingbeck hospital for smallpox, including formation of a new road. Mr. Edwin T. Hall, architect, 54 Bedford Square, W.C.

**MANCHESTER.**—Aug. 29.—For painting walls at schools at Swinton, near Manchester. Mr. A. J. Murgatroyd, architect, 23 Strutt Street, Manchester.

**MANCHESTER.**—Aug. 30.—For erection of an electricity generating station adjoining Longford Bridge, Stretford. Mr. Ernest Woodhouse, architect, 88 Mosley Street, Manchester.

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NEWCASTLE-ON-TYNE.—Aug. 30.—For erection of fifteen workmen's cottages at High Coxlodge. Particulars and plans to be seen at Coxlodge Colliery Office, Gosforth.

NEWCASTLE-ON-TYNE.—Aug. 30.—For erection of offices, &c., in Pilgrim Street, Newcastle-on-Tyne. Mr. Henry Holliday, Consett Iron Co., Consett.

NOTTINGHAM.—Sept. 1.—For erection of a refuse destructor and stables at the dépôt, Wollaton Road, Radford. Mr. Arthur Brown, city engineer, Guildhall, Nottingham.

PARKESTON.—Sept. 3.—For erection of schools for 510 children and alterations at Parkeston, Essex. Messrs. Start & Rowell, architects, Colchester.

QUEENSBURY.—Aug. 27.—For enlargement of a bakehouse, Queensbury, Yorks. Particulars on application at the offices of the Industrial Society, Queensbury.

SCOTLAND.—Aug. 26.—For erection of an infants' school at Grangemouth. Mr. James Strang, architect, Vicar Street, Falkirk.

SCOTLAND.—Aug. 30.—For erection of an infectious diseases hospital at Bo'ness Acres. Mr. R. J. Jameson, town clerk, Bo'ness.

SCOTLAND.—Aug. 29.—For alterations and additions to the Co-operative Society's buildings at Denny. Mr. James Strang, architect, Vicar Street, Falkirk.

SWINDON.—Aug. 25.—For extensions to the technical school, Victoria Road. Messrs. Bishop & Pritchett, architects, Regent Circus, Swindon.

THORNTON.—For erection of five terrace houses in Ashfield Road, Thornton, Yorks. Mr. W. Pickels, architect, Thornton.

TRURO.—Sept. 8.—For erection of a rectory at St. Mary's, Truro. Mr. G. H. Fellowes Prynne, architect, 6 Queen Anne's Gate, Westminster.

WALES.—For erection of six houses at Griffithstown, Mon. Messrs. Swalewell & Creighton, architects, Steam Packet Chambers, Newport, Mon.

WALES.—Aug. 25.—For erection of a boys' school at Blaengarw. Mr. P. J. Thomas, architect, Bridgend.

WALES.—Aug. 25.—For erection of a cottage hospital, &c., at Rhymney, Mon. Messrs. Llewellyn, Smith & Davies, architects, Aberdare.

WALES.—Aug. 27.—For erection of a lunatic asylum at Caerleon, Mon. Mr. A. J. Wood, architect, 22 Surrey Street, Victoria Embankment, W.C.

WALES.—Aug. 29.—For alteration to Salem Baptist chapel, Port Dinorwic. Mr. E. Evans, architect, 8 Castle Street, Carnarvon.

WALES.—Aug. 30.—For erection of a Welsh Calvinistic Methodist chapel, schoolroom, &c., on the Tyr-Arlwydd Estate, Penrhwi-ceiber. Mr. T. Roderick, architect, Clifton Street, Aberdare.

WALES.—Aug. 30.—For erection of a curate's house at Bryn, near Port Talbot. Mr. Frank B. Smith, architect, Port Talbot.

WALES.—Aug. 30.—For rebuilding the Royal Oak inn, Troedyrhiw. Mr. T. Roderick, architect, Glebeland, Merthyr Tydfil.

WALES.—Sept. 1.—For additions to The Ivies, Hereford Road, Abergavenny. Mr. B. J. Francis, architect, Abergavenny.

WALES.—Sept. 7.—For erection of a temporary iron small-pox hospital, containing provision for eight beds, at Pontypridd. Mr. J. Colenso Jones, clerk, District Council Offices, Pontypridd.

WALES.—Sept. 8.—For erection of a cattle and sheep market at Llandovery. Mr. John Thomas, town clerk, Llandovery.

WALES.—Sept. 15.—For erection of a new school, consisting of mixed and infants' departments, at Llwynycelyn, Porth. Mr. Jacob Rees, architect, Hillside Cottage, Pentre.

WALSALL.—Sept. 8.—For erection of a school to accommodate 1,000 children and a caretaker's house at North Walsall. Mr. H. E. Lavender, architect, Bridge Street, Walsall.

WESHAM.—Sept. 30.—For erection of workhouse and offices at Wesham, Lancs. Messrs. Haywood & Harrison, architects, Accrington.

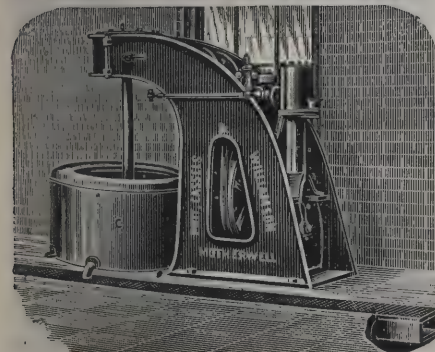
WIBSEY.—Aug. 27.—For additions and alterations to branch stores at Wibsey, Yorks. Messrs. John Drake & Son, architects, Queensbury.

WOMBWELL.—For erection of a high chimney at Wombwell gasworks. Mr. John Robinson, surveyor, Wombwell, Yorks.

WOODHAM.—Aug. 31.—For erection of a wayside inn at Woodham. Mr. F. H. Livesey, architect, Bishop Auckland.

WOOLWICH.—Sept. 18.—For erection of municipal buildings at the corner of Wellington Street and Upper Market Street, Woolwich. Mr. A. Brumwell Thomas, architect, 5 Queen Anne's Gate, Westminster.

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## TENDERS.

## BARNSELEY.

For erection of fifteen houses and shops, outbuildings and boundary walls, Greenfoot Lane, Old Town, Barnsley. Messrs. CRAWSHAW & WILKINSON, architects, 13 Regent Street, Barnsley.

## Accepted tenders.

J. Taylor, mason, &c.  
E. Ashworth, joiner, &c.  
Miss Fleming, slater.  
B. Denison, plumber, &c.  
C. Dryden, plasterer, &c.  
E. R. Fletcher, painter, &c.

## BENWELL.

For erection of eighteen houses in Colston Street, Benwell, Northumberland. Messrs. FARTHING & DUNN, architects, 21 Pilgrim Street, Newcastle.

Atkin, Burrell & Co.	£6,700	0	0
J. W. Dixon	6,570	0	0
W. Worley, jun.	6,147	0	0
M. Morris	6,048	0	0
J. McEWAN, Newcastle-on-Tyne (accepted)	5,790	12	0

## BOSTON.

For fixing a wrought-iron fence by the side of St. John's burial-ground in St. John's Lane. Mr. W. H. WHEELER, engineer, Market Place, Boston.

C. & C. Wright	£99	0	0
G. White	97	15	0
PEEK & SON, Borough Ironworks (accepted)	64	2	6

## BRADFORD.

For erection of a furniture depository in Picton Street, Manningham. Mr. CHARLES E. MARSDEN, architect, 3 John Street, Bradford.

## Accepted tenders.

Briggs Bros., mason.  
J. Hobson, joiner.  
W. Bolton, plumber.  
W. Hargreaves, plasterer.  
G. Wilkinson, slater.  
A. Bassett, painter.

## BURNHAM-ON-CROUCH.

For erection of an engine-house at the waterworks.

C. Read, sen.	£195	0	0
G. GOULD, Burnham-on-Crouch (accepted)	194	10	0

## CASTLEFORD.

For outside painting and writing of the Castleford Co-operative Industrial Society's central premises.

G Shackleton	£16	5	0
W. Lawrence	12	10	0
M. H. Watson	12	10	0
T. WATSON, Carlton Street, Castleford (accepted)	12	5	0
Firth & Co.	8	12	0

## CHESTER.

For sewerage works, with manholes, ventilators, flushing-chambers, &c., bacteria filter-beds, effluent outfall and other works connected therewith. Messrs. KNOWLES & RUSSELL, engineers, 5 Castle Street, Liverpool.

T. Rowland	£14,374	14	4
Jowett Bros.	8,536	1	6
W. Thornton & Sons	8,160	14	6
R. T. Amery	7,798	0	0
J. TAYLOR, Garston, Lancashire (accepted)	7,192	13	11

## CHESTERFIELD.

For construction of a main outfall sewer at Cresswell, Clown. Mr. E. HAZELDINE-BARBER, engineer, Hollin Hill, Clown, Chesterfield.

J. Jackson	£1,888	0	0
Barker Bros.	1,671	0	0
A. F. Houfton	1,627	0	0
W. Thomason	1,623	0	0
J. C. Turner	1,539	0	0
C. Fulcher	1,530	0	0
R. Wood	1,468	0	0
COPE & RAYNOR, Lenton, Nottingham (accepted)	1,335	0	0

## DORCHESTER.

For laying cast-iron pipes, constructing reservoir, erecting engine-house and contingent works in connection with the Maiden Newton water supply. Mr. FREDERICK W. MAGER, engineer, Aldridge, Walsall.

Wills & Sons	£1,475	0	0
T. Vale	1,264	0	0
Case Sea Defence Syndicate	1,130	17	0
SHARDLOW, Nottingham (accepted)	1,093	0	0

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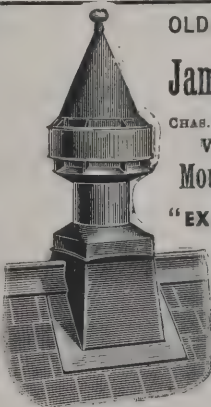
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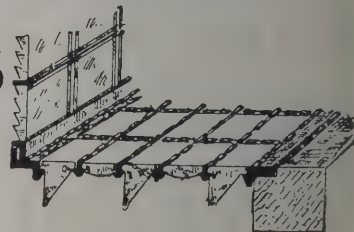
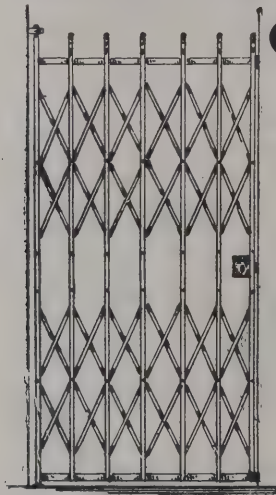
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M. LOVELL, 12 Tamworth Place, Arley Hill, Bristol (accepted) . . . . .	428	0	0

## STONEHAM.

For draining outfall works, engine-house, bacterial beds, &c., at North and South Stoneham, Hants. Messrs. BAILEY-DENTON, SON & LAWFORD, engineers, Westminster.

Reid Bros. . . . .	£31,086	12	10
F. W. Trimm . . . . .	29,023	0	0
Price . . . . .	28,986	16	8
John Jackson . . . . .	27,052	17	4
Joseph Jackson . . . . .	26,632	5	0
Streeter & Todhunter . . . . .	26,260	0	0
G. Ossenton . . . . .	26,012	0	0
H. J. Saunders . . . . .	25,870	0	0
J. & T. Binns . . . . .	25,120	13	0
Jones . . . . .	24,981	12	0
Osman . . . . .	24,587	14	4
Cooke & Co. . . . .	23,315	0	0
PLASCOTT (accepted) . . . . .	22,304	0	0

## TAMWORTH.

For erection of boiler-house, chimney-stack and coal stores, seating the necessary boilers, &c., in connection with the heating of the proposed new infirmary and workhouse.

E. WILLIAMS, Tamworth (accepted) . . . . . £359 0 0

For supply and fixing of all necessary pipes, fittings and heating apparatus required for the heating of proposed infirmary and workhouse.

GRIFFIN FOUNDRY CO. (accepted) . . . . . £1,070 0 0

## TENDRING.

For supply and installation of kitchen, scullery, laundry and wash-house apparatus and machinery, heating apparatus, hot-water fittings, &c., at the workhouse at Tendring, near Colchester. Mr. F. WHITMORE, architect, 17 Duke Street, Chelmsford.

Summerscales & Sons . . . . .	£989	0	0
D. & J. Tallis, Ltd. . . . .	932	10	0
Werner, Pfeiderer & Perkins, Ltd. . . . .	890	0	0
Tomlinson & Milan, Ltd. . . . .	867	10	0
Cherry Tree Machine Co. . . . .	793	7	6
F. W. LEWELLEN, Clacton-on-Sea (accepted) . . . . .	659	14	0

## ULVERSTON.

For sewerage works for the village of Cark. Mr. W. F. T. MOLINEAUX, engineer, 3 Benson Street, Ulverston.

J. Cleator . . . . .	£594	17	0
Hinchcliffe & Co. . . . .	589	16	0
J. Rainey . . . . .	576	13	6
J. Laurie . . . . .	545	0	0
Barker Bros. . . . .	529	6	9
T. & W. DIRKIN, Kendal (accepted) . . . . .	460	8	0
R. Shuttleworth . . . . .	388	18	0

For erection of a porter's lodge. Messrs. SETTLE & FARMER, architects, Ulverston.

J. GRICE, Oxford Street (accepted) . . . . . £250 15 0

## WALES.

For erection of ten workmen's dwelling-houses at Fleur-de-Lis, Mon. Mr. GEO. KENSHOLE, architect, Station Road, Bargoed.

J. Williams . . . . .	£2,187	10	0
W. Leo . . . . .	2,000	0	0
H. R. Paul . . . . .	1,955	0	0
E. Edwards . . . . .	1,825	0	0
T. MATTHEWS, Bedwas, Mon. (accepted) . . . . .	1,755	0	0

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WALES—continued.

For installation of heating apparatus, with high-pressure steam-pipes, for Bethania C. M. chapel and vestry, Maerdy.  
BATES & SONS, Canadian Stove Works,  
Ditchingham Street, Sheffield (accepted) . . . £59 0 0

For improving the ventilation of Llwynhendy school, Llanelly.  
J. Williams . . . . . £48 15 0  
F. J. Vivian . . . . . 46 19 0  
T. & J. Brown . . . . . 43 19 0  
W. VIVIAN, Church Street, Llanelly (accepted) . . . 43 0 0

For erection of house and outbuildings at Gwehelog, Usk, Mon. Mr. T. H. WILLIAMS, architect, 5 Wind Street, Aberdare.  
LUCAS, Usk (accepted) . . . . . £350 0 0

WINDSOR.

For erection of about 750 feet (more or less) of 9-inch walling at the Windsor cemetery.  
London and County Builders, Ltd. . . . . £668 17 4  
Butcher & Hendry . . . . . 435 0 0  
A. H. Reavell . . . . . 423 0 0  
Hollis & Sons . . . . . 420 0 0  
R. FOREMAN, Temple Road (accepted) . . . . . 407 0 0  
Surveyor's estimate . . . . . 428 0 0

For erection of about 240 yards of unclimbable iron fencing at the Windsor Cemetery.  
A. Wood . . . . . £180 0 0  
F. Morton & Co., Ltd. . . . . 144 0 0  
G. B. Smith & Co. . . . . 139 0 0  
Boulton & Paul, Ltd. . . . . 138 0 0  
J. W. Palmer & Co. . . . . 132 0 0  
Rawlinson & Co. . . . . 130 0 0  
W. Miller & Sons . . . . . 123 0 0  
Bayliss, Jones & Bayliss . . . . . 123 0 0  
J. Elwell . . . . . 120 0 0  
Hill & Smith . . . . . 117 0 0  
W. Hayward & Son, Ltd. . . . . 117 0 0  
W. Bain & Co. . . . . 116 0 0  
E. J. Raybould & Co . . . . . 114 0 0  
COLES & BROWN, Bristol (accepted) . . . . . 96 0 0

WEST HOUGHTON.

For erection of municipal buildings at West Houghton, Lancs. Messrs. BRADSHAW & GASS, architects, 19 Silverwell Street, Bolton.  
W. TOWNSON & SONS, LTD., Park Hill Saw-mills, Bolton (accepted) . . . . . £4,922 0 0

Received too late for Classification.

SCOTLAND.

For erection of an infant school and alterations on present school buildings at Lossiemouth. Messrs. A. & W. REID & WITTET, architects, Elgin.

Accepted tenders.  
J. McPherson, mason.  
G. Peterkin, carpenter.  
J. Wilson, slater  
J. Gordon & Son, plumber.  
C. & W. Menzies, plasterer.  
W. Fordyce, painter.

TRADE NOTES.

THE new infirmary, Swindon, Wilts, is being warmed and ventilated by means of Shorland's patent Manchester stoves, with descending smoke flues, by Messrs. E. H. Shorland & Brother, of Manchester.

SUN FANS for ventilating and other purposes are, as its style would suggest, the specialty of the Sun Fan Company, Ltd, who supply the fans in all dimensions, to be driven by belt or electricity, and all particulars concerning these will be found in the new price list (in two sections) which the company are sending out.

DRURY LANE THEATRE, Sunderland, collapsed on Sunday, the 17th inst. For some time past a spring of water has caused the flooding of the pit, and this is supposed to have undermined the foundations. Four houses on the opposite side of the street were demolished by the falling ruins, but luckily all were unoccupied.

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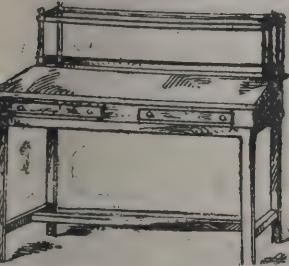
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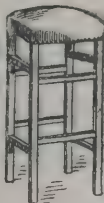


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**ELECTRIC NOTES.**

THE Clacton-on-Sea Council have decided to retain the electric-lighting order in their own hands, instead of leasing it to a company.

THE Louth (Lincolnshire) Corporation have under consideration a scheme for the erection of an electric-light and power works, at a cost of 10,000*l.*, on land in the centre of the town belonging to the Corporation. The electric-lighting committee recommend the carrying out of the work, and a provisional order has been obtained.

At a meeting of the Greenock Corporation, Bailie Cameron, in submitting the electricity accounts, which showed a deficit of 1,390*l.*, stated that it was almost impossible to make electricity works pay during the first few years. He was glad, however, to be able to inform the members that during the last six months the works had paid their way. The accounts were approved.

At a meeting of the Gainsborough Urban Council, a report by the clerk was considered upon the notices received from the Electric Supply and Traction Company and the United Electric Light and Power Company of their intention to apply for orders to supply electricity for lighting and power within the urban district. The clerk reported that similar notices had been received in 1900 from other companies, when the Council proceeded to give notice of applying to the Board of Trade for leave to supply electricity in their district. Plans were deposited, but no further steps were taken. The remainder of the report was practically a recommendation to the Council to apply for power to supply electricity within their district. After some discussion, it was decided to instruct the clerk to take the necessary steps to obtain a provisional order.

THE Board of Trade have received, through the Foreign Office, from His Majesty's Commercial Attaché at Shanghai, a copy of an advertisement issued by the Municipal Secretary at Tientsin calling for proposals for the lighting of the British concessions by electricity, which reads as follows:—"The British Municipal Councils, in accordance with the terms of the resolution passed at the general meeting of landowners, &c., held on May 2, 1902, are now prepared to receive proposals for the lighting of the concessions by electricity, such proposals to be submitted not later than November 30 of this year." It is signed by Mr. A. W. Harvey Bellingham, A.M.I.C.E., secretary and engineer. It is understood that no details or specifications will be furnished.

COLONEL LANGTON COKE, C.E., held an inquiry at Nantwich on the 20th inst. with regard to an application by the Urban Council to borrow 12,505*l.* for electric-lighting purposes and 1,275*l.* for the erection of a refuse-destroyer. Evidence in support of the application was given by the clerk and surveyor to the Urban Council and by Mr. Peers, electrical engineer of Manchester. The scheme provides for the erection of generating works and a refuse-destroyer on the Council's sewage farm close to the town, and for the same motive power to be used for both purposes. A memorial from manufacturers and tradesmen complaining that they were unable to compete with manufacturers and tradesmen in other towns owing to the excessive price charged for gas was read in favour of the scheme. The annual payments were estimated at 1,932*l.* and the income at 2,440*l.*, this sum including 2,250*l.* which it was anticipated would be derived from the sale of electricity to the public at a charge of 6*d.* per unit. Mr. Wm. Harvey, a former member of the Council and a large ratepayer, whilst approving the erection of a destructor, strongly objected to the introduction of the electric light. Mr. Cummings and Mr. Bower, architect, also opposed the application, and in closing the inquiry Colonel Coke promised that the representations made should be placed before the Local Government Board.

**BUILDING AND BUILDERS.**

A NEW Roman Catholic church is in course of erection in Liverpool Road, Irlam. It will cost, with furnishing, upwards of 3,000*l.*

THE external walls of Halesowen parish church are being restored at a cost of 2,000*l.*, and it is hoped that the work will be completed by October.

THE foundation-stones of a Primitive Methodist church have been laid at Swalwell, near Gateshead. The church will provide accommodation for 250 worshippers, and will cost over 1,000*l.* The schoolroom is to be erected at a later date.

THE ancient parish church at High Wycombe (Bucks) is to be enriched by a handsome window placed there in commemoration of the Coronation. The church is the largest edifice in Buckinghamshire, and is known as the "Cathedral of Bucks."

AN accident has occurred whereby a joiner named William MacKay was very seriously injured. While five men were

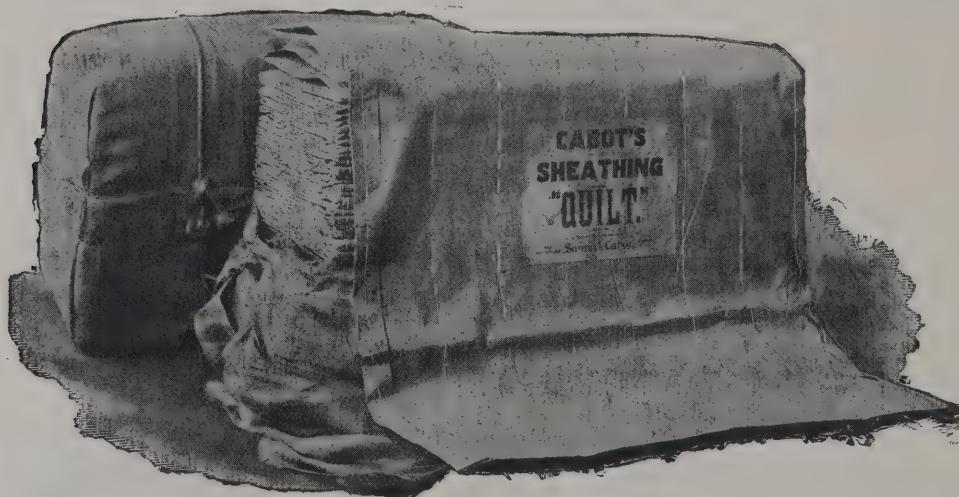
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## ILLUSTRATIONS.

LLOYD'S BUILDING, FENCHURCH STREET, E.C.: BOARD-ROOM.

CATHEDRAL S RIES.—HEREFORD: THE NAVE.

GLENROY, FINCHLEY: EXTERIOR FROM GARDEN FRONT.

DESIGN FOR PUBLIC BATHS, BRAMLEY.

engaged at the taking-down of the old Scoonie parish church, Leven, N.B., one of the heavy rafters suddenly gave way, and all the men fell a distance of 25 feet. MacKay was conveyed home, and lies in an unconscious state. A boy named Kerr had his leg injured, while the others got off with cuts and bruises.

THE death occurred on the 13th inst. of Mr. Charles H. Beloe, C.E., Liverpool, who carried out many important works in various parts of the country. He was regarded as an expert in drainage matters, and acted as engineer to the International Water and Sewage Purification Company of London. He was author of several standard treatises on construction of reservoirs and town water supplies. Deceased was an officer in the Engineer Volunteers and a member of the Liverpool City Council.

## VARIETIES.

THE new County Sanatorium which has nearly been completed by the Urban District Council of Malvern, will be opened early in September.

A GERMAN invention of a new fire ladder was exhibited last week most successfully at Messrs. Whitbread's yard, Chiswell Street, E.C.

THE Pontefract Primitive Methodist chapel has been reopened after the expenditure of several hundred pounds on redecoration, &c.

IN addition to the memorial to the Duke of Westminster in Chester Cathedral, which was recently inaugurated, a monument is to be erected in the church of St. Mary-without-the-Walls, Chester.

THE new church erected on the north side of the Stewart Avenue, Bo'ness, to meet the growing wants of the Catholic

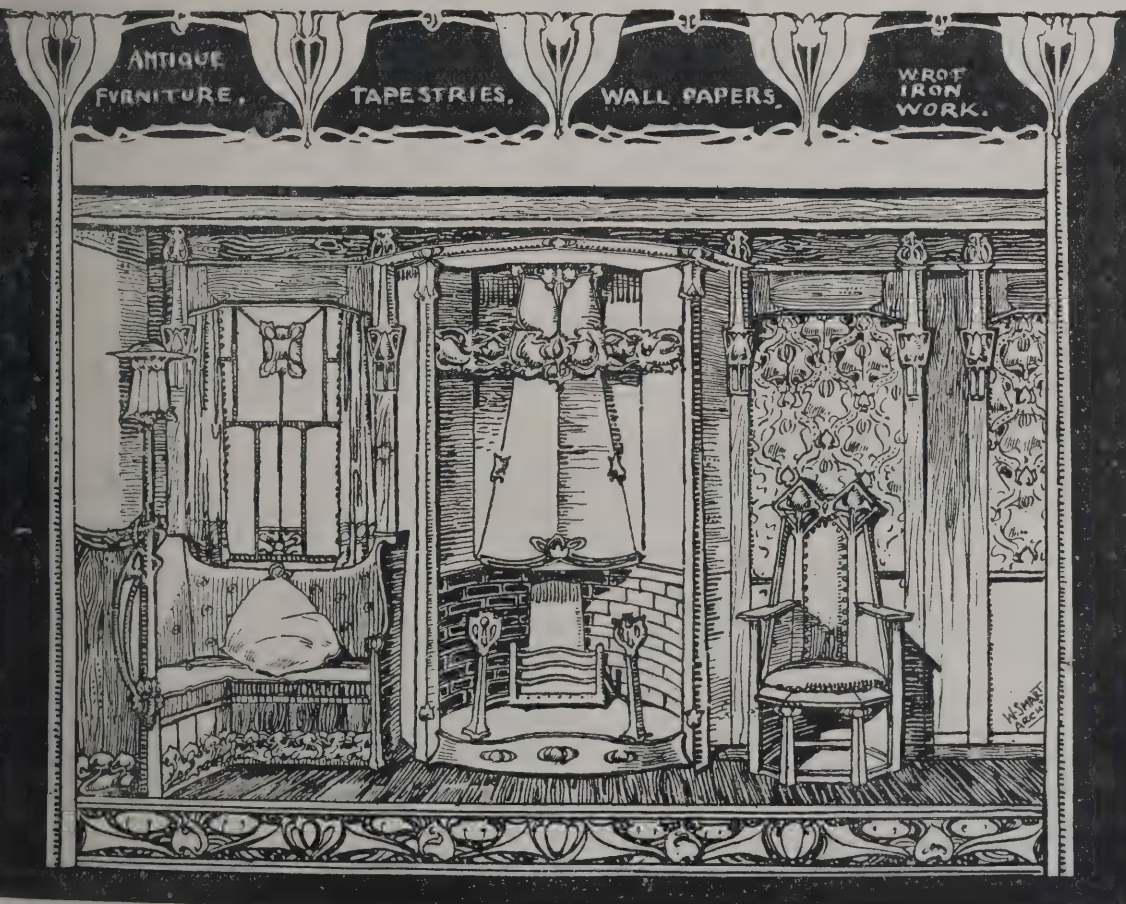
community has been formally opened. The building, erected at a cost of over 2,000*l*, will also be used as an elementary school, four classrooms being provided to accommodate 250 pupils.

AT the half-yearly meeting of the Central Board of the National Association of Master Plumbers of Great Britain and Ireland at Huddersfield, the president, Mr. W. L. Harrison, R.P., read a report of the work of the educational committee with reference to the form of indenture for apprentices which had been drawn up in conjunction with the Worshipful Company of Plumbers. Hitherto there has been great laxity in the trade throughout the country respecting apprentices. The form of indenture was adopted providing for a seven years' apprenticeship, unless the lad has been previously pursuing his education to fit him for his trade at a technical school on conditions varying according to localities.

A LIMITED competition for the Carnegie library at Coat-bridge has just been decided. Mr. T. L. Watson, architect, Glasgow, was selected as assessor, and advised the committee and the Town Council throughout the competition. On his recommendation the plans of Mr. Alexander Cullen, Motherwell, were adopted from among ten sets submitted, and premiums were awarded to Messrs. A. N. Paterson, Glasgow; George Arthur & Sons, Airdrie & Alexander MacGibbon, Glasgow. One competitor was disqualified, his design being much in excess of the limit of 10,000*l*.

AT a meeting of Ayr School Board, in committee, the six sets of plans submitted in competition for the new school were considered, together with a report by a measurer. It transpired that the original estimate of 9,000*l* had been exceeded in every case, the lowest, that of Mr. John Arthur, architect, Ayr and Glasgow, being 11,113*l*. By five votes to four Mr. Arthur's plan was selected. The minority voted for the plan of Mr. John Eaglesham, architect, Ayr, which was 1,800*l* dearer than that of Mr. Arthur.

ON the 11th inst. the foundation-stone was laid of the new Sunday-school which is being erected in connection with Christ Church, Buckingham Road, Tuebrook. The building when completed will accommodate 250 children. It will be of brick and of neat design, with classrooms, in addition to a large main room, and besides being used as a Sunday-school it is intended to be utilised for other parochial purposes. Mr. Harding is the architect, and the builders are Messrs. W. Caird & Son. The cost will be about 400*l*.



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AN exhibition of old and interesting bells will be opened in the Museum, Elgin, on Saturday. The collection will include bells cast in France, Flanders, Elgin, Old Aberdeen, &c., from the fifteenth century. Contributions will appear from Elgin (the prayer bell of St. Giles, 1504), Birnie (the quadrangular Rounel bell), Duffus (Flemish bell of fifteenth century), Dyke (French bell of sixteenth century); also from Glass, Botriphnie, Rafford, Edinkillie, Kinloss, &c. Mr. F. C. Eeles, Stonehaven, sends casts of inscriptions of bells and rubbings of Northern bells, as the "Wow o' Rivven"; also a series of inscriptions on English bells from the earliest times to the present day. The exhibition will remain open for a week.

### STREET IMPROVEMENTS IN YORK.

AN inquiry has been held by Mr. R. H. Bicknell into the application of the City Council to borrow 10,340*l.* for street improvements, and 2,630*l.* for a refuse destructor and depôt. The following are the parts to be improved:—Bishophill Junior, 370*l.*; Nessgate, 5,600*l.*; Coppergate, 620*l.*; College Street, 2,850*l.*; High Petergate and St. Leonard's Place, 900*l.* Nessgate is a short narrow thoroughfare in the centre of the city, through which a large portion of the traffic for Fulford and the East Riding must necessarily pass. The tramway for the Mount district also runs through it, and the traffic is very congested. It is most important, therefore, that the thoroughfare should be widened. The Corporation have already acquired some of the property in the street, and the remainder for which sanction to borrow the money is required comprises the Star and Garter public-house and two adjoining shops. The fee simple of this property it has been arranged to purchase for 5,500*l.* The area to be purchased is 190 square yards, of which 146 square yards are required for the improvement, leaving 44 square yards available for resale. The Corporation have also entered into a provisional agreement by which they will be able to acquire so much of the site of the Coach and Horses hotel at the corner of Nessgate and Low Ousegate as will enable them to complete the scheme by effecting an appreciable widening at that important corner. The amount required for the Coppergate improvement is to enable the Corporation to purchase the reversion of a shop at the corner of Nessgate and Coppergate, in which they already hold a leasehold interest. When they have obtained this they will be enabled to effect the much-needed widening of Coppergate, and

thus materially relieve the traffic in Nessgate and High Ousegate. The College Street improvement involves the making of a new street from Goodramgate to Minster Yard. Early in 1899 the Local Government Board sanctioned the borrowing of money for the purchase of property immediately adjoining the ancient archway in College Street for the purpose of widening that thoroughfare. In order to effect the improvement it would have been necessary to have acquired some further property of the Dean and Chapter of York Minster. The Minster authorities were very much opposed to the scheme, especially as they were advised that the heavy traffic would endanger the safety of the east end of the Minster, and ultimately it was decided to construct a new street from Goodramgate to Minster Yard, and arrangements were made with the Dean and Chapter for the purchase for 1,060*l.* of the fee simple of the land (1,366 square yards). The Corporation are also to erect the necessary fences, gates, boundary walls and re-erect outbuildings and other works on the property of the vendors which may be affected by the making of the proposed new street. The 2,850*l.* required to be borrowed is calculated as follows:—Purchase money, 1,060*l.*; cost of making new road, 1,043*l.*; building walls and erecting palisadings, 747*l.*, &c.

### WORKMEN'S COMPENSATION ACTS.

THE statistics of proceedings issued by the Home Office shows that the number of cases under the Workmen's Compensation Acts dealt with in England and Wales by County Court judges and County Court arbitrators tends to increase, the totals for the three years 1899, 1900 and 1901, being 999, 1,145 and 1,370 respectively. The extension of the Act to agriculture accounts for only 11 of 1,370 cases in 1901. The number decided by judges has increased from 828 to 1,046 to 1,289, while the number of cases in which it was necessary to appoint a special arbitrator has fallen from 98 and 29 to 9. The cases settled by acceptance of money paid into Court numbered 73, 70 and 72. In addition to these there were 348, 407 and 548 cases which were either withdrawn, settled out of Court or otherwise disposed of in such a way as not to enable the officials of the Court to state definitely the results.

Of the claims for compensation finally settled in 1901 within the cognisance of the Courts, the decision in 1,007 cases was in favour of the applicant, and in 167 in favour of the respondent. The proportion of cases in which the applicant

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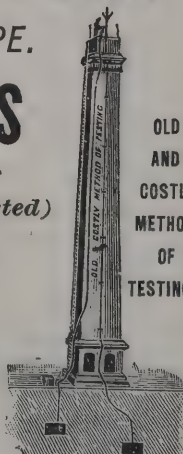
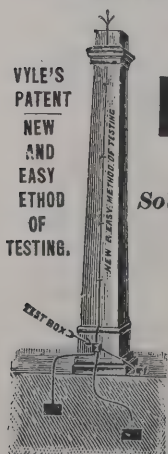
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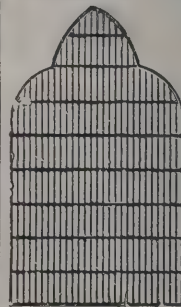
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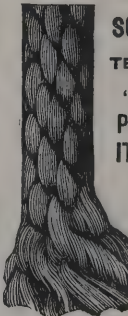
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successful has, therefore, increased from 75 per cent. in 1899 and 81 per cent. in 1900 to 86 per cent. in 1901.

In 399 cases the award was a lump sum; in 608 a weekly payment. Both figures show a progressive increase as compared with the two previous years. In the cases of weekly payments, while the weekly rate can be given, the length of time for which the payments were or will be made cannot be ascertained except in a few cases, and it is, therefore, impossible to attempt any complete statement of the capitalised value of the grants of compensation.

In 301 cases the compensation was awarded on account of death, and in all of them the deceased had left dependents. The total amount so awarded was 56,702l. 3s. 7d., a considerable increase over the total figures for the two previous years, and the average award in each case has risen from 173l. 1s. 7d. in 1899 and 163l. 8s. 9d. in 1900 to 188l. 7s. 7d. in 1901.

With regard to the grants of compensation for injury, there were 98 cases in which the compensation is returned as consisting of a lump sum. In 19 of these cases the plaintiff accepted money paid into Court. In the remaining 79 cases a lump sum appears to have been awarded by consent of the parties. The average was 32l. 5s. 1d.

In 608 cases of injury a weekly sum was assigned, 345 being cases of total and 263 cases of partial incapacity. The average rate of weekly allowance for the last three years has been, in case of total incapacity, 10s. 11d., 11s. 6d., 11s. 10d.; in the case of partial incapacity, 9s. 2d., 10s. 9d. and 9s. 8d.

The number of cases under the head of building to which the Acts of 1897 and 1900 apply were as follows:—1899=159; 1900=151; 1902=243.

During the year 1901 the County Courts in which there were the greatest number of arbitrations under the Workmen's Compensation Act were Bow 83, Liverpool 76, Manchester 66, Birmingham 59, Pontypridd 58. The number of cases under the Employers' Liability Act is very much greater at Bow than at any other County Court, the figure being 141 for Bow as compared with 31 for the next highest (Manchester).

The tendency in the metropolitan courts to proceed under the Employers' Liability Act, in preference to the newer statute, is even more marked than in previous years. In circuits 40, 41, 42, 43 and 44, and in the City of London court, there were 301 cases under the Employers' Liability Act, against 201 under the Workmen's Compensation Act, while for the rest of England and Wales the figures are 289 under the former and 1,717 under the latter. There were 268 courts in

which there was no case under either Act. Of the 1,636 memoranda registered, 214 were in the Stokesley and Guisborough county court, 99 in Middlesbrough, 137 at Bow, 91 at Manchester and 75 at Pontypridd.

The number of cases under the Workmen's Compensation Act carried to the Court of Appeal in England was 61, or a little more than 3 per cent. of the cases that came before the county courts. This is a considerable decrease as compared with 1900, when the figure was 90, or nearly 6 per cent. In Scotland also the number of appeals has decreased from 32 to 23. Of the 61 appeals 22 were appeals by workmen and 39 by employers. Of the former 6, of the latter 7, were successful.

The list of appeal cases which was given in the returns for 1899 and 1900 has been continued for the year 1901, and, as in previous years, a brief note showing the point in the Act on which the appeal arose has been inserted in all cases in which it could be ascertained. It will be found that there are eighty-six cases in which the point at issue is stated, including eighteen noted as involving two or more points each. In thirty of the eighty-six cases the question was at issue whether the workman's employment was one to which the Act applied. There were three appeals to the House of Lords as compared with seven in 1900. In all these cases the workman was the appellant. Only one was actually carried to a hearing.

Speaking generally, a comparison of the returns for 1901 with those for the years 1899 and 1900, the first two complete years when the Act was in force, does not show any great change in its operation.

The number of appeals on questions of law has, however, diminished considerably—the figures for the three years are 54, 90 and 61—and there seems therefore reason to hope that progress has been made towards the definite settlement of the legal difficulties in the interpretation of the Act of 1897. In an Act dealing, as this Act does, with entirely new matter, the legal questions to be settled are necessarily very numerous; and in view of the enormous range of cases to which the Act applies, it is reasonable to suppose that the great majority of these difficulties would come up for decision in the earliest years of its operation.

On the other hand, the number of cases brought to the county courts—in most of which it must be questions of fact that are at issue—still tends to increase. The figures are 1,347, 1,552, 1,918. But, even in view of this increase, the statement must be repeated that the cases which come before the county courts do not represent more than a very small proportion of

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those in which compensation is paid under the Act. The great majority of claims are settled by agreement, and only a small percentage are made the subject of formal arbitration.

### STREET IMPROVEMENTS AT WOLVERHAMPTON.

MORE than a quarter of a century has gone by, says the *Birmingham Daily Post*, since the Wolverhampton Corporation obtained powers under the Artisans' Dwellings Act of 1876 to change the appearance of the centre of the borough, and the demolition of old buildings and the making of new streets have been not only beneficial from a health point of view, but have introduced a number of new and up-to-date business structures, which will vie in design and architectural development with any that can be found in the leading cities in the kingdom. Before the Act was passed Wolverhampton had, perhaps—within a small area and only a few yards distance from the principal square in the centre of the town—as many slum dwellings as any town in the country. The occupants were a disgrace to the borough and were a continual source of trouble to the police and other authorities; and it is satisfactory to be able to relate that since this part of the town has undergone alteration there has been a great diminution in the complaints that previously had to be dealt with. Great divergence of opinion existed at the time as to the wisdom of the local parliament in including in their Bill so wide an area for improvement purposes as they did, but in all probability in years to come the inhabitants will admit that while the cost has been very heavy, it was better to devise drastic sweeping away of old dwellings at the time than have to carry out a lot of patchwork arrangements to effect improvements at probably a heavier cost later on. Through the centre of the condemned area there has been cut a new Lichfield Street, which is a credit to the residents, as it has on either side some of the finest commercial and other buildings in the borough. It is the main thoroughfare leading from the two railway stations into the heart of the town, and the thousands of visitors to the Art and Industrial Exhibition have been surprised to see such a wide thoroughfare flanked by high and splendidly designed buildings. It is only, however, in very recent times that this street has fully been filled up with shops, offices and other structures. For a long time after it was laid out it presented a most desolate appearance, as few people could be induced to buy land and build upon it; but a

fillip was given to building operations when the late Alderman V. Jackson induced the post office authorities to remove the post office from Queen Street to Lichfield Street, and provide a building which is quite in keeping with the Grand Theatre, the Art Gallery and other architectural acquisitions to be seen in the immediate vicinity. The last and most noble looking venture to complete the line of buildings has just been completed. For twenty-three years the Corporation and the owners of a piece of ground in this street, with sides to Princess Square and Wulfruna Street, were unable to come to terms as to the character of the structures to be placed upon it, but the difficulty disappeared on the land being purchased by the Royal London Friendly Society on behalf of their investment and estate department, this being one of a number of buildings that are being erected in various commercial centres as investments for the funds of the Society, who have raised a palatial building which out-views any one of the kind in the town. The massive edifice is capped by an ornamental tower which stands out in bold relief above the adjoining elevations, and catches the eye at once of every person entering the town from the railway stations. The building has a stone exterior with some exquisite carved work dividing the various storeys; it is four storeys in height, and the material used internally is of such a character as not only to be soundproof, but almost fireproof, there being no woodwork in the partitions. While beautiful in design the main feature of the pile is the cosmopolitan character for which it will be used. There are ten shops in the ground floor with basements and sub-basements and fronting Lichfield Street, and entered at a semicircular door, provision is made for an hotel. It contains a wide entrance hall and staircase with passenger lift leading to the upper floors and basement. There is a spacious commercial dining-room, coffee-room, writing, reading and other rooms, and on the second and third floors are thirty-three bed and sitting-rooms, while the kitchens on the most modern principle will be placed on the floor above. The building also contains a public hall with stage and retiring-rooms for the performers; a suite of Turkish baths; and rooms for club or other purposes. The building, which has been erected by Messrs. H. Willcock & Co., of Wolverhampton, from plans prepared by Messrs. Essex, Nicol & Goodman, architects, of Birmingham, is a welcome addition to the many recent street architectural improvements, and is a ready answer to those croakers who will not see that the town is growing in population and importance at a

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rapid rate. The total cost of the building will be over 30,000L., and the estimated rental value is placed at 1,500L. Another indication that outside speculators are of the opinion that Wolverhampton is likely to become a most valuable centre of industry may be seen in Dudley Street, where a syndicate is expending a large sum of money in erecting an arcade, which will extend from the street mentioned through John Street to Victoria Street, over a vast area of ground that has been partially covered with dilapidated dwellings for a period almost beyond the knowledge of any inhabitant. The entrance to the arcade is of a most ornamental design, and not only takes the place of a number of old shops, but is set back so as to widen the thoroughfare, and we understand that the syndicate are endeavouring to purchase a block of adjoining property so as to further improve the appearance of the street. The question of widening Dudley Street has occupied the attention of the Town Council for about thirty years, but the anticipated cost has always been a bar to the corporate authorities making what has been regarded for many years as an absolutely necessary improvement, and if a number of private gentlemen widen, and at the same time beautify the thoroughfare, it is certain that they will be granted the thanks of the residents, and especially the ratepayers, who will see as the outcome of the syndicate's venture an increase in the rateable value of the town. The arcade, which is only partially completed, is entered through a short, shop-fronted passage 14 feet wide, which is afterwards increased to a width of 17 feet. The shops on either side of the arcade are fitted with large plate-glass windows set in handsome frames of polished walnut. The centre of the building is broken by a "rotunda," with handsome glass dome, and here it is intended that a band shall be placed to not only attract customers but provide them with pleasurable entertainments. In the basement of the rotunda there will be a café. A number of other welcome street improvements have been, within a short period, proposed, and will be carried out shortly. Newhampton Road has been widened, beneficial work is to be carried out in Salop Street, North Street is being altered in a manner at the corner of Wadham's Hill that will enable vehicular and pedestrian traffic to proceed with greater freedom, and when the St. Peter's schools have been pulled down the wholesale market will be extended and a partly covered market and other acceptable alterations will be made in this part of the town, which will completely alter it in appearance. The rates of Wolverhampton are undoubtedly heavy, and the expenditure of the Town Council is at present on such a lavish scale as to cause some

of the residents to wonder whether with the existing bad trade they will be able to meet the demands of the authorities, but they have the satisfaction of knowing—as we have pointed out—that there are capitalists who are prepared to lay out their wealth in the town on new buildings, and this fact ought to encourage them to hope that the town will be far more prosperous in the future than it has been in the past.

#### ELECTRIC LIGHTING OF LARGE OFFICE BLOCKS.

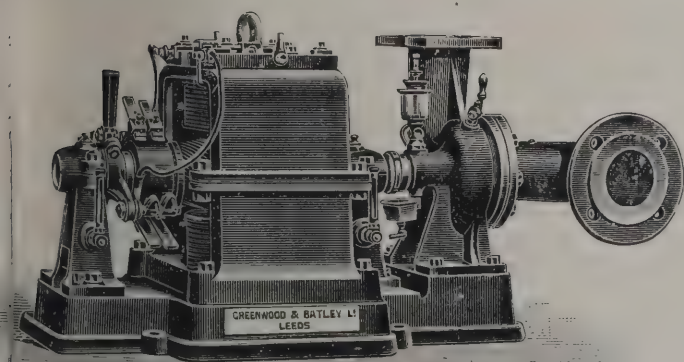
In the present day, when the price of electric energy is comparatively cheap, it is not uncommon to find that current required for the lighting of large blocks of buildings in London is taken entirely from the electric street mains. An important addition to an already very large installation is that of the new Westinghouse Building and its annexe, comprising part of the Law Land Company's estate. The building consists of seven floors and basement, each floor being designed for about fourteen rooms. Three wire service mains are brought into the building by the Charing Cross and Strand Electricity Supply Corporation, the supply being by continuous current at a pressure of 200 volts at the lamps. The main distribution board is of enamelled slate mounted in a massive teak frame, and provides for a separate circuit to each floor of the building, each circuit being controlled by D.P. fuses and a S.P. chopper type switch. From this main board a separate circuit is run to each of the local distribution boards for supplying the various floors through the D.P. bridge type fuses. All lamp circuits are run back direct to distribution board, no fuses being employed locally. The maximum number of incandescent lamps supplied from any sub-circuit is eight, and with few exceptions every lamp is furnished with a separate switch. The wiring is carried out in Simplex brazed tube, all the tubes being fixed in position as the buildingwork proceeded, and the wires drawn in afterwards. Westinghouse Building contains upwards of 700 lights, together with a very elaborate and extensive system of electric bells for the tenants, and service gas fire points, speaking-tubes, &c. The total number of lamps now on the estate supplied is estimated at about 5,000.

The whole of the work is under the supervision of Mr. Frederic H. Taylor, C.E., Assoc. M. Inst. E.E., of 14 Victoria Street, S.W., the consulting engineer to the company, and it is always carried out by the electrical staff of the Law Land Building Department.

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Name.	Age	Occupation.	Place.	Award.
Cook, C.	19	Fitter's Apprentice	Landport, Prtsmth.	Royal Exhibitions
Brown, G. E.	20	Engineer's App.	Balloch, Dum-bartonsire, N.B.	
Stewart, C. J.	20	Fitter's Apprentice	Fratton, Portsmt.	
Childs, G. H.	20	Fitter's Apprentice	Portsmouth	
Welch, W.	19	Fitter's Apprentice	Fratton, Portsmt.	
Macklin, E. L.	21	Fitter	Buckland, Prtsmth	National Scholarships for Mechanics (Group A)
Jones, A.	21	Student	Crewe	
Tisdall, H. G.	23	Draughtsman	Beeding, Sussex	
Holloway, J. J.	19	Laboratory Assist.	Saltley, Birmingham	
Andrews, G. H.	22	Fitter	Sheerness	
Alexander, J.	24	Draughtsman	Glasgow	Free Studentships for Mechanics (Group A)
Lees, C. I.	18	Engineer App.	Oldham	
†Royds, R.	24	Engineering Student	Oldham	
Gardner, W. E.	23	Engineer	Edgbaston, B'ghm.	
Fowler, H.	22	Student	Urmston, Manchester	
*Pearse, L. E. B.	22	Engineering Student	London	National Scholarships for Physics (Group B)
Woodall, A. E.	17	Student	Swinton, Lancs	
Brinkworth, J. H.	17	Student	Chippensham	
Moss, H.	17	Assistant Teacher	Leeds	
Connolly, T. F.	23	Teacher	St. Albans	
McKenzie, A. H.	22	Teacher	Salford, Manchestr	Free Studentships for Physics (Group B)
Evans, E. J.	20	Student	Llanely	
*Hooton, W. M.	17	Student	Sutton Bridge, Lincs	
Joseph, A. F.	21	Demonstrator	London	
McDonald, A.	17	Student	Middlesbrough	
Blyther, D. F.	19	Student	London	National Scholarships for Chemistry (Group C)
Hird, J. M.	17	Student	S. Woodford, Essex	
Morgan, H. H.	20	Science Teacher	Rhayader, Wales	
†Birkby, J. W.	20	Leather Worker	Leeds	
Kirkby, R. G.	18	Student	Whitstable	
Collins, W. F.	19	Student	London	Free Studentship for Chemistry (Group C)
Southwell, T.	22	Weaver	Todmorden	
Pratt, A. E.	18	Student	London	
Haworth, G.	19	Book-keeper	Burnley	
Dewhurst, T.	20	Weaver	Burnley	

\* Extra Free Studentships transferred from Group D and E.

† Extra National Studentships transferred from Groups D and E.

## REBUILDING OF SONNING BRIDGES.

THE quarterly meeting of the Oxfordshire County Council held at the County Hall, Oxford, on the 6th inst. The roads and bridges committee reported that an intimation was given in February, 1892, that the Sonning bridges would not withstand frequent heavy traffic or serious floods. The bridges form an important means of communication between the river leading to the river Thames at Eye and Dunsden on the Oxford side, and at Sonning on the Berkshire side, the nearest way of crossing the river being Caversham Bridge, about 3 miles on one side, and Henley Bridge, about 5 miles on the other side. At this point the river is about 300 yards wide and is crossed by a series of three county bridges, an iron-vening roadway, and the bridge over the navigable part of the river, which is not a county bridge. The three bridges repairable by the County Council are wholly in Oxfordshire, and consist of Mill Bridge, an old wooden structure over the Mill Stream, 188 feet in length; New Bridge, a brick and timber structure over a branch of the river, 139 feet in length; and Hall's Bridge, a wooden structure over a back channel, leading from the Weir, 111 feet in length—making a total length of 438 feet, the average width of all the three bridges being 15 feet. Several members of the committee inspected the bridges, in consultation with the county surveyor, when it was evident that new piles and supports were necessary, and a further examination resulted in forcing the committee to the conclusion that it would be useless to expend money upon the continual repairs of the old structures, and that a new and better bridge would eventually prove the most economical scheme. The committee have therefore decided to recommend the removal of the existing wooden lengths, the substitution of iron piles and steel girders, the strengthening of the present brick portions and addition of brick abutments at each end, and the widening of the bridges so as to insure a roadway of 24 feet. As it is most desirable to commence the work before the winter months, the committee request that they may be authorised to obtain and accept tenders, and to employ the county surveyor to undertake the rebuilding of the bridges according to the plans prepared by him, at a cost not exceeding 8,000/.

Sir W. Markby said the beauty of the Thames was a valuable possession of the county, and he was afraid that would be totally destroyed if the old bridges at Sonning were replaced by girder bridges. It would not be a great expense to preserve the ancient character of the bridges.



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Lord Saye and Sele thought the Council ought to have the of the county surveyor before them. It was proposed to t three bridges at a cost not exceeding 8,000*l.*, and he d not help thinking the character of the three auxiliary ges would be much better maintained if the old timber ctures were in some way renewed. This would tend to p up the appearance of the beautiful village of Sonning and d save a great expense to the county.

Mr. Ashhurst said the question was thoroughly gone into he county surveyor, and it was found impossible to repair old bridge. He thought the recommendation that had arrived at was the only way to come to a definite conclu-

The new structure had been carefully considered, and would like to work on the lines of the old bridge.

Sir W. Markby thought that a brick bridge would not be gely as an iron bridge.

Alderman D. Blount said if the present bridge was going to altered, the Thames Conservancy would require a wider erway by the removal of the existing piers, which were a nt obstruction to the flow of the water.

Mr. Brakspear pointed out that the question had been oughly considered. The plans might be altered if a fair was paid by the Thames Conservancy and the obstruction sed by the piers removed.

The Earl of Jersey said he did not like opposing the report ny committee, but it seemed to him when they were iding such a large sum on the bridge it was desirable that abers of the Council generally should have some idea of t was going to be done. The plans would have to be mitted to the Thames Conservancy, and further additions ht, be insisted upon. He suggested that the question d be deferred until the next meeting.

The Chairman did not think it was any use for a large nt to look over plans. The reason for the report was the e of losing a season.

A Councillor: Is it necessary to do the work this year?

The Chairman: I am afraid the bridge is in a dilapidated e, and no one can tell what would happen if we put the k off for a season.

The County Surveyor: There is always a risk. The present ge would go with anything like a heavy weight.

Alderman D. Blount: You will have to get the consent of b Thames Conservancy, and they do not meet again until ober 6.

Mr. Neighbour said Alderman Blount seemed to be under

the impression that the proposal referred to the bridge going over the main stream. That was not the alteration proposed. The new bridge would go over that part of the river which took the overflow water at the side. So far as the waterway was concerned, what was proposed was to do away with the forest of piles that carried the bridges and caught and accumu- lated everything brought down. What was desired was an uninterrupted waterway.

Alderman Newton said if the work was not proceeded with great expense would have to be gone to in the shape of repairs.

The Earl of Jersey asked if the consent of the Thames Conservancy would be necessary with regard to these improve- ments. If that was necessary it was obvious that could not be obtained until October 6.

The County Surveyor said between now and October they would be dealing with a great part of the bridge that did not affect the waterway. He had a doubt as to whether the Thames Conservancy had anything to do with it, but he was sure the waterway would be so improved that October 6 would be quite soon enough for their permission, because they would not touch the pile bridges with which the Conservancy were concerned.

Sir W. Markby seconded the Earl of Jersey's amendment.

On a division sixteen voted for the amendment and seven- teen against. The report of the committee was then agreed to.

### ABERDEEN HARBOUR WORKS.

THE Harbour Commissioners spent a busy afternoon last week in the annual inspection of the extensive works under their care. They visited first the operations at Regent Bridge, which is now almost ready for the erection of the steelwork and machinery. It has been arranged that the bridge will be swinging and the railway traffic across docks commenced by August of next year. The new bridge, which will cost about 50,000*l.*, is only part of a big dock improvement scheme, which will involve an outlay of 104,000*l.* Continuing their walk southwards the Commis- sioners next saw the work in progress for the reconstruction and widening of the Commercial Road wharf, for the extension of the fish market. Built originally for the smaller class of trawlers, this quay has become entirely inadequate for the require- ments of the larger class of vessels now being built for the fishing industry. Provision is also being made for a depth of 16 feet at low water of spring tides. These improvements will cost 17,000*l.*, but they do not exhaust the arrangements in contemplation for the accommodation of this now great industry. By the recent

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purchase, at an expenditure of 50,000*l.*, of ground on the south side of the Dee, the Commissioners will be able when necessary to double the facilities at present existing for the fish trade. The visitors, on passing the pontoon dock in the Albert basin, observed from the signboard that the vessel at present undergoing repairs there is the 710th since the dock was acquired about two years and four months ago. The engineer is at present engaged on a report showing the need of extra docking accommodation. The Commissioners then saw the graving dock, harbour workshops and the recent reconstruction of Provost Matthews's quay. In passing to inspect the outer sea works in a steam tug the party witnessed the dredging operations which are destined to give an additional depth of 5 feet of water along the whole length of the navigation channel, the work being carried out in rock. Not the least interesting of the schemes now on hand is that connected with the tunnelling of the Dee, whereby the whole of the city sewage will be carried in a large syphon under the river and discharged at Girdleness. This is a most difficult operation, but every precaution has been taken for its safe execution, and the tunnel has been placed at such a low level that it may not hamper the expansion of the dock system. The harbour engineer, Mr. R. Gordon Nicol, C.E.; his assistant, Mr. Simpson; Mr. Ross, harbour treasurer; and Captain Crombie, harbour master, accompanied the Commissioners, and gave explanations regarding the progress of the various works on hand.

### TRADE IN NORWAY.

THE report on the trade and commerce of Norway for the year 1901, by Mr. Consul-General Dundas, states that the exportation of timber during the year has been very much less profitable to exporters than in 1900. Prices declined at the beginning of the year and so continued, the fall ranging from 25 to 40 per cent. The following figures give the total export of timber from Christiania in 1901:—

	Quantity. Cub. Metres.
Planned timber . . . . .	77,614
Sawn " . . . . .	57,681
Hewn " . . . . .	2,569
Round " . . . . .	59,862
Staves, &c. . . . .	2,502
Laths . . . . .	534

Being altogether 30,793 cubic metres less than in 1900, or about 10 per cent.

Owing to the diminished activity of the building trade in Christiania in the past year the local consumption of timber has been proportionately reduced. The establishment also of several new planing mills has occasioned a number of failures, and it may safely be said that this branch of the business has been overdone. With a view to improving the market, Mr. Vice-Consul Thiis, at Frederikstad, the centre of the timber trade, reports that the members of the Norwegian Floor Association have agreed to restrict their purchases of logs to the extent of 33 per cent. Mr. Vice-Consul Franklin, at Bergen, echoes the general complaint as to unsatisfactory results during the year which occasioned losses to exporters, especially as selling prices in the United Kingdom and on the Continent were not at all proportionate to cost of wood. But the shipment of the log stocks for autumn 1902 and spring 1903 will be curtailed in consequence of the smaller log cutting during the past winter that the supply and demand will be in favour of the timber merchant.

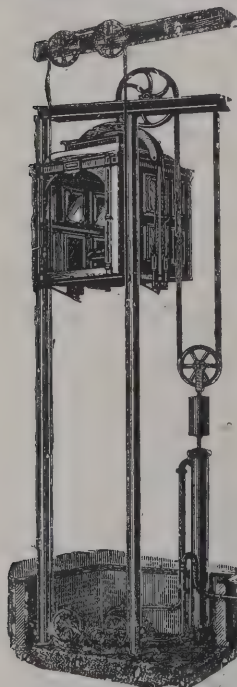
The United Kingdom is by far the largest consumer of Norwegian timber and timber products, taking over two-thirds of the total value of the exportation of unworked timber, manufactured and manufactured timber, Belgium, France and Germany coming next.

The export of granite is chiefly to the United Kingdom, and is said to have increased considerably of late, especially hewn granite for paving stones. Both in regard to the quantity and prices there is little difference compared with 1900. The German consumption of granite has, however, decreased, and, as a view, it is asserted, to develop her own quarries. The chief centre of the granite production is in Smaaleene. During the year a union has been formed among the Norwegian exporters of kerb stones to the United Kingdom.

Of other kinds of stone exported may be mentioned scabbled stone ("klæbersten"), which is used in buildings chiefly for ornamental purposes, and which is most durable, unaffected by heat or cold; marble; felspar, which goes principally to Germany and France; and quartz. But Christiania is so much interested in this branch of exportation. The total quantity of hewn stone exported to the United Kingdom in 1900 was 68,265 tons.

The building trade, which had declined in 1899 and 1900, showed signs of revival last year, the number of new buildings registered amounting to 922, against 764 in 1900. Of these

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number quoted, 112 were dwelling-houses and 21 business or factory buildings. During the course of the year the building authorities passed 105 new dwelling-houses, and the whole number of new additional dwellings amounted to 1,226. At present time a considerable number of dwellings, as also of business premises, are standing empty, and as a consequence values have fallen considerably. Property has likewise suffered depreciation, and only 13 new companies, with a capital of only 27,500*l.*, for the purpose of buying up properties, were entered, against 52 new companies, with a nominal share capital of 543,956*l.*, in 1900. Of the companies registered last year, one with a capital of about 5,500*l.* was for the purpose of speculating in property at Ofoten.

## VENTILATION OF THE KAISER'S NEW YACHT "METEOR III."

The new racing yacht, *Meteor III.*, built in America for Kaiser Wilhelm, the German Emperor, and christened by the President's daughter, Miss Roosevelt, is, as was to be expected, fitted with the very latest improvements and up-to-date in every respect. The ventilation, so defective in many high-class yachts, has not been overlooked, its importance being fully recognised, not only in so far as the comfort and health of those on board are concerned, but the internal timber fittings, store-hold, sail-closets, &c., are also kept in good and sound condition, even when damp sails are stowed away, by the constant circulation of air, which is effectively preventing mildew, dry-rot and the unpleasant smells generally experienced "below" on such craft when imperfectly ventilated.

The "Boyle" system of ventilation (natural), supplied by Messrs. Robert Boyle & Son, Ltd., ventilating engineers, London and Glasgow, is the method employed, and embraces Boyle's latest patent "air-pump" ventilator (upcast) and Boyle's latest patent downcast ventilator, which effects a continuous change of air between decks under all conditions of the weather, as, owing to these ventilators being perfectly waterproof, the system can be kept in operation at all times, even during the roughest weather, when the deck is swept by seas. The system is automatic, and having no mechanical movement of any kind it cannot get out of order and requires no attention—most important features in the ventilation of vessels.

There is no doubt that the "Boyle" system is a good one. It was awarded the 50*l.* prize with grand diploma—the only prize offered—at the International Ventilation Competition, London, presided over by Lord John Manners, and the highest award for ventilation at the last Paris Exhibition—two gold medals and one silver medal—when some of the best known systems in Europe and the United States competed.

It is employed in the British and foreign navies and by the principal steamship companies in this and other countries, from whom Messrs. Boyle have received many valuable reports, one being from a first naval lord of the Admiralty and another from Lord Kelvin, in connection with the application of the "air-pump" ventilator to his yacht *Lalla Rookh*.

As a significant indication of the serious attention that is now being paid by foreign Governments, as well as our own, to the proper ventilation of warships, we may mention that the Russian Government are extensively employing the "Boyle" system, sixteen battle-ships having up to the present been ventilated throughout with this system, whilst others are in progress.

The Indian troopship *Hardinge*, the largest troopship, we believe, in existence, designed by Sir Edward Reed for the British Government, and recently built by the Fairfield Shipbuilding Company, Glasgow, is fitted throughout with the "Boyle" natural system of ventilation, that system having been selected by the Admiralty as being the most suitable for the very trying conditions existing in such a vessel.

## THE BISLEY HOMES.

The following letter from "A Subscriber" has appeared in the *Times*:—

May I attempt to give an answer to the important questions raised by you in your leading article of the 16th inst., which I have only just seen?

I was a large subscriber to the building trades' gift to the nation. Owing to Lord Pirbright and the Soldiers and Sailors' Help Society my subscription has been absolutely wasted. I should have preferred to keep silent, but as Lord Pirbright and Lord Cheylesmore, better known to the building trade as General Eaton, with Sir Theodore Martin have again resumed their unseemly wrangling, and you have now brought your great influence to bear in favour of the truth being known, I

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feel it is only just that as far as they relate to the building trades' gift to the nation the facts should be stated.

In 1900, on "the suggestion of Mr. Edwin O. Sachs, chairman of the British Fire Prevention Committee, in consultation with several leading builders and manufacturers, it was decided to ask the building trades of Great Britain to help in the matter of meeting the requirements of wounded soldiers returning from the Transvaal war." A strong committee was formed. The administrative work was to be in the hands of a small executive, comprising Mr. Sachs (the originator of the gift), Mr. Farrow, Mr. Hammond and Mr. Ellis Marsland, with Sir John Taylor (H.M. Office of Works), Mr. Thomas Blashill (late architect to the London County Council) and Mr. Arthur Cates (past vice-president of the Royal Institute of British Architects, late Crown surveyor) as advisers. The donors were also represented by, amongst others, the well-known contractors, Mr. J. Randall (Kirk & Randall), Mr. H. H. Bartlett (Perry & Co.), Mr. J. Howard Colls (Colls & Sons), Mr. George H. Trollope (George Trollope & Sons) and Mr. T. F. Rider (T. Rider & Sons), who was appointed hon. secretary.

A circular was issued. It stated:—"Lord Pirbright has generously given an extensive freehold site at Bisley," that "the Soldiers and Sailors' Help Society has undertaken the management and maintenance of the homes to be erected on this site under a scheme initiated by H.R.H. Princess Christian." The building trades were to erect six cottage homes, which homes were to be known as the building trades' gift to the nation. "The gift was primarily to take the form of contributions in kind," but those firms who could not see their way to contribute in kind were asked to do so in cash. Large contributions both in kind and in cash were promised. Messrs. Trollope & Sons agreed to carry out the work practically at cost price.

Everything went well until August 1900, when the controversy between Lord Pirbright and Sir Theodore Martin and the Soldiers and Sailors' Help Society began. In consequence the executive of the building trades' gift had to consider their position. I think I cannot do better than quote a resolution passed at a meeting of the executive on October 23, 1900:—

"The building trades' gift having proceeded with the erection of the homes at Bisley on the land presented by Lord Pirbright, on the understanding that they would be vested in the Duke of Connaught, Lord Derby and Lord Pirbright as trustees, and the committee having been recently informed

that the two former trustees have not at present accepted trust, and that, in consequence of the position take up by Soldiers and Sailors' Help Society, Lord Pirbright expressed his intention of withdrawing from the trustees, and that no rules and regulations have yet been framed, the committee regards the present state of circumstances as unsatisfactory, and is of opinion that the legal position, regards the land and the trusteeship, should at once be clearly defined, and that they should be officially informed by whom and under what conditions the homes, when completed, are to be managed; and further, that, under the circumstances, building operations generally should be suspended until the above points have been satisfactorily cleared up."

It seems incredible that the gentlemen whose names I have given, who, with others, undertook to be responsible to the building trades for the proper carrying out of their gift to the nation, should have proceeded to erect these homes before the land had been conveyed or the trust accepted. But so it was. The differences between Lord Pirbright and the Soldiers and Sailors' Help Society stopped the work nearly two years.

"Twelve months elapsed before a reconveyance of the land was completed," and then the Soldiers and Sailors' Help Society informed the executive of the building trades' gift to the nation "that the soldiers evinced so strong a disinclination to occupy so large a block of homes as those at Bisley that those already erected by them are still untenanted." The chairman of the Soldiers and Sailors' Help Society further informed the executive "that, if the homes in connection with the building trades' gift were completed, his committee would do their best to utilise them."

This, sir, is a brief statement of the facts. The building trade responded to the call made upon them; the men at many of the building jobs made collections, I suppose altogether contributions in kind and cash exceed 20,000£, and for the purpose. It is not likely the building trade will contrive another penny.

While admitting that those responsible for the building trades' gift should never have started until they were certain of their position as to the conveyance of the land, the trusteeship and the maintenance of the homes when finished, it is very owing to the miserable and petty squabbling of Lord Pirbright and the Soldiers and Sailors' Help Society that those who have fought so well and suffered so much in the Transvaal have been deprived of what was honestly meant by the building trades to be a comfort and a benefit to them.

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# The Architect.

## THE WEEK.

THE resolution which is to be submitted to the trustees of the Manchester Infirmary after the holidays is as follows:—"That the board of management of the Royal Infirmary be empowered to negotiate once more the sale of the entire Piccadilly site and buildings thereon to the Manchester Corporation for the sum of not less than 400,000*l.*; and, in the event of the City Council again refusing to purchase, that the Board be authorised to offer the site, with the sanction of the Charity Commissioners and subject to Act of Parliament, for sale publicly to the highest bidder, with a view of applying the proceeds, if and when sold, to the erection of a new infirmary of adequate accommodation and equipment on a suitable site elsewhere." At present there is no public announcement of the course which will be adopted by the Manchester Corporation. It is needless to say there are several suggestions about the utilisation of the site for the benefit of Manchester. No more commanding position is to be found in the city, and if the removal were practicable, Mr. WATERHOUSE'S town hall would be the most suitable building to be placed there.

UNITY is never more desirable than in connection with a series of wall-paintings. Without that principle the different works fail to give mutual aid and to co-operate in producing a definite result. They become to some extent like annual exhibitions. That, we fear, is destined to be the fate of the pictures in the Panthéon. When it was decided to adorn the walls with paintings by modern French artists, the history of Christianity in France was to be made manifest. The building being then used as a church, and dedicated to St. GENEVIÈVE, the late PUVIS DE CHAVANNES and M. JEAN-PAUL LAURENS depicted scenes in the life of the patroness of Paris. Panels were also assigned to St. DENIS, St. LOUIS, CHARLEMAGNE, JOAN OF ARC, &c. But since the church has been secularised there is a desire to avoid ecclesiastical subjects. M. EDOUARD DETAILLE has received a commission to paint incidents in the three days' Revolution of July 1830, and they are to be placed in the apse above the mosaic by HÉBERT, which shows CHRIST telling His disciples to love one another. The late JULES DALOU before his death had completed the model for a group representative of the orators of the Revolution, and M. ANTOINE MERCIÉ is engaged on a similar work which will recall the generals. There is no guarantee that some of the existing canvases may not be superseded by other scenes from the Revolutions. To secure consistence a course of that kind cannot be avoided. M. DETAILLE has also finished two grand pictures which are to appear on the walls of a *salle* in the Hôtel de Ville. The subjects are the *Enrolment of Volunteers in 1789*, and the *Return from Jena*, the latter suggesting that the Municipal Council, at least, are not afraid of Germany. The painter is also busy on a painting for the ceiling, and some for other panels in the *salle*.

In the reports of the examiners on building construction, it is evident that the students in the schools of the Board of Education, although they may produce showy drawings, are not well grounded in the elements of construction. The teacher is for the future advised to explain common building materials, the sizes of bricks, why there is more uniformity in their sizes than in slates, why water condenses on the inner surfaces of glass, windows, walls, &c. It would seem incredible that almost all the candidates for honours were unable to tell the weight of a piece of iron of given dimensions. To say that a piece of iron an inch square and a foot long weighed 500 lbs., or 4 or 5 lbs., is proof that there is no realism or practical character in much of the teaching. The notes of lectures were often nonsense. Lord GRIMTHORPE once remarked that an architect was an artist in respect of his drawings. We wonder what he would say if the following paragraph of the examiners on drawings which were submitted in honours classes came before his lordship's eyes:—"In regard to drawing we do not see the same accuracy, as a rule, in building drawings that we find in machine drawings.

Every builder, as an architect, is an artist, and practises a fine art. However this may be, his plans, elevations and sections are no more necessarily fine art than are the drawings of a mechanical engineer. Why will students of this class throw careless washes of colour over dirty, careless pencil drawings? Do they think they have anything in common with rapid water-colour sketches for art purposes?" A few examples of genuine architectural drawings would evidently be of great utility in the schools, and should be purchased by the authorities like other examples of work.

GROUND in the neighbourhood of the sea or tidal rivers has often sources of danger when used as building sites, which are not apparent however carefully the soil may be examined. It is only when the walls of buildings are being carried up and the weight is increased on the stratum that the inadequacy of supporting power is realised. In such circumstances amateur builders who have grown wise after the event find opportunities to display their skill. A case of this kind has just occurred at Brighton. A generating station for the lighting of the town is in course of construction at Fishersgate. The foundation walls were nearly completed when it was ascertained that the southern one showed signs of weakness. It was therefore decided that the site should be slightly changed, the northern wall taking the place of the southern. There is nothing remarkable in the mishap, but as the work was executed for the Corporation it is needless to say that the usual amount of criticism is heard, and the failure of the soil is ascribed to other causes than the want of cohesion among the materials beneath the surface. The sea at Brighton was not always under such control as it appears at present, and evidently the waves were allowed to follow their own sweet will at Fishersgate, for the ground in a geological sense is not of ancient date, and has not been consolidated by ages. The Brighton Town Council cannot expect to be guaranteed against contingencies any more than a private building owner, and their duty now is to make the best of the conditions, and to be thankful that the failure was not of a more costly character.

THE remarks on school buildings in the recent reports of the inspectors of the Board of Education suggest that all that is desirable by teachers and students is not always provided. Mr. CARTLIDGE, the chief inspector of art instruction, states that even in some of the best new schools lighting is not sufficiently considered. The broad mullions and transoms cause confusion of lighting, which is an obstacle to the progress of the students. The storage accommodation is insufficient, and he says "in the matter of ventilation it would seem that most architects are unable to make satisfactory arrangements in school of art buildings." He refers to one case of a modelling-room in which the clay and work bin, arranged internally so as to keep the clay and models in a damp state, was carefully surrounded by hot-water pipes. Mr. ALLPORT is of opinion that in technical schools enough attention is not bestowed on the planning and selection of a site to allow of adequate lighting of the art section. In one school out of five art-rooms only one has a north light. These are serious shortcomings, and it seems unjust to blame masters and students for defective work when the students have to encounter such unfavourable conditions.

In this country assistance is given by the officers of the Geological Survey on questions relating to water-supply. The inquiries which are necessary for the preparation of memoirs and plans enable them to be cognisant of phenomena which would be unobserved by an engineer whose examination was limited by time and circumscribed in area. In the United States they have gone a step further. A section of hydrography has been introduced in connection with the Survey, which is under the charge of a doctor of medicine. The object of it is to obtain trustworthy information about the character of the water in all parts of the country, not only in rivers, but when derived from underground sources. The aid of willing assistants has been secured, and a uniform method of investigating will be adopted. Information will then be available which will diminish the costliness of preliminary reports on water-supply, besides imparting more certitude to the data.





PAINTERS' ARCHITECTURE: DOMENICHINO.

## TWO SCOTTISH MASONS.

THE people of Cromarty have done well by celebrating the birth of their townsman, HUGH MILLER. Friends and admirers have assured themselves of his immortality, but renown is as fleeting as most other things on earth. HUGH MILLER's claims to it are based on his geological studies and on his controversial writings. His power of expressing his visions of the former state of the earth was so marvellous, it is difficult for a matter-of-fact geologist to resist the conclusion that MILLER was inspired by imagination rather than by close observation. He helped to popularise geology, but it would be puzzling to find a geological treatise or a paper in which his authority is quoted. Sir ARCHIBALD GEIKIE, who has much in common with HUGH MILLER, said with truth that "he clothed the dry bones of science with living flesh and blood. He made the aspects of past ages to stand out once more as his vivid imagination conceived that they must once have been. He awakened an enthusiasm for geological questions such as had never before existed; and this wave of popular appreciation which he set in motion had never since ceased to pulsate throughout the English-speaking population of the world." The ex-director of the Geological Survey of Great Britain also acknowledged that "it was MILLER's 'Old Red Sandstone' that first revealed to him the ancient history that might be concealed in the hills around him and the meanings that might be hidden in the commonest stones beneath his feet. He had been interested in such objects, as boys are apt to be who spend much of their time in the open country, but it was that book which set him on the path of intelligent inquiry." HUXLEY, too, testified to the patience and sagacity of MILLER in his researches, and to the natural insight which seemed to have supplied the place of anatomical knowledge. But the modern geologist requires more or less acquaintance with anatomy, and field-work is now served by processes which were unknown to HUGH MILLER. As regards his writings on Church policy, a great many people in Scotland would at the present day be unable to give an account of the controversy on one side of which HUGH MILLER was a champion fifty years ago. Indeed, for some time before his death he was, we believe, regarded with suspicion by members of his own party. It is therefore doubtful whether as a man of science or a man of letters he will retain a hold on posterity. But the story of his life and its tragic ending should hereafter insure to him the sympathy of men.

We must not forget that HUGH MILLER was a quarryman and a mason. On that account he has a claim on our recognition. Indeed, we think his example may tend to enforce a lesson which is much needed. There is no doubt he was a genuine Scotsman, but Cromarty, where he was born in 1802, possessed many families from the Lowlands, and some of whom no doubt originally came from England. Popular belief is, however, in favour of the theory that he was of Viking descent, which view is thought to be upheld by the fact that his father and several of his

relatives were sailors. HUGH MILLER was early an orphan and claimed the right to be lord of himself and dispose of his life as he wished. Accordingly he bound himself as an apprentice to a stone-mason; he began by working in a quarry. In that way he first came in contact with the Old Red Sandstone of which afterwards he gave such glowing descriptions.

In his "Schools and Schoolmasters" and "First Impressions of England" there are passages which prove that he was contented with his trade, or perhaps it would be more correct to say that he courageously resolved to make the best of the situation, like MARK TAPLEY when he was an architect's partner in the flourishing city of Eden. He studied hard during the enforced idleness of the winter months, and remembering, we suppose, the example of ALLAN CUNNINGHAM, he tried his hand at poetry. But there was a largeness about MILLER's imagination which would not bear to be restricted by metres, and the most ardent of his admirers would not easily remember his compositions in verse.

After a time he obtained an appointment in a bank, and abandoned stone-working. He continued to write. He showed such ardour in Church affairs that when it was proposed to establish a journal to advocate the views of men of similar opinions he was selected as editor. HUGH MILLER thought, no doubt, that he had a mission, and his articles in *The Witness* suggested that the fierce covenanting spirit was not extinct. He wielded words like a claymore. Every article of his signified a loss of nerve force, and before many years were over his brain, which was that of an intellectual giant, was beyond the controlling power of his will. He varied controversy with essays on geology. Science, if rightly followed, might have served as a regulative power, but his manner of treating the phenomena of geology imposed a strain on him almost as severe as the contentions of Church parties. He must have known also that he was touching perplexing subjects. It was the general belief in Scotland that Genesis and geology were opposed, but one service rendered by HUGH MILLER was, by his genial ardour and irresistible eloquence, sweeping away, as Sir ARCHIBALD GEIKIE said, "the last remnants of the barrier of orthodox prejudice against geology in this country. The present generation can hardly realise the former strength of that bigotry, or appreciate the merit of the service rendered in the breaking of it down." When at length, after correcting the proofs of his last volume, "The Testimony of the Rocks," he raised his strong hand against himself, even his opponents had to acknowledge that he was a brave and just man who had sacrificed himself in the service of science and religion.

In 1785 ALLAN CUNNINGHAM was born in Dumfriesshire. At the age of eleven he also was apprenticed to a stone-mason. He endured similar vicissitudes to HUGH MILLER, but he had gained a local reputation as a rhymester at a much earlier period than the Cromarty youth. The fame of BURNS was accepted by everyone in Dumfriesshire, and as the poet lived until 1796 the bright young CUNNINGHAM



was one of his votaries, and he has given a description of the poet's appearance which probably comes nearest to truth. He brought out an edition of BURNS's works in 1834.

CUNNINGHAM grew tired of masonry, and before he was thirty he was known in London as an industrious writer in prose and verse. WALTER SCOTT was deceived by some of his ballads, which he concluded were ancient examples worthy of a place in any Border Minstrelsy. As in the case of MILLER, literature was followed with persistence, suggesting that thoughts could arise and be expressed with the regularity with which stones were dressed. But composition carried on under such circumstances is exhausting. MILLER died when he was fifty-four, and CUNNINGHAM, whose life was amidst happier surroundings, died when he was fifty-seven. He found congenial occupation as the major-domo, the confidential manager of Sir FRANCIS CHANTREY's workshops for the production of sculpture. His admirers were of all ranks, and it was real gratification to Sir WALTER SCOTT when he was in London to visit "Honest ALLAN." His writings are of many classes; but, unlike MILLER, CUNNINGHAM wrote several romances, a drama, biographies, as well as six volumes of lives of the most eminent British painters, sculptors and architects. He contributed successfully to the enjoyment of his contemporaries, and if all his writings do not survive, some of his songs will, we hope, be remembered as long as the men and women of Scotland have voices.

Whether the two masons missed their true vocation it is now impossible to determine. They were both men endowed most liberally with imagination. MILLER's sometimes seemed to be almost as sublime as MILTON's. They were not the only clever men in Scotland or in England who were to be found toiling as masons. But as the trade was then administered, and to some extent it is unchanged, they were out of place in a stoneyard. It would be an error to undervalue the simplest masonry, and there are problems in stone-cutting which require no small amount of intellect. But such work as falls to an ordinary journeyman in the farmhouses and houses in the small towns of Scotland never calls for extraordinary skill, and it is easy to conceive a great part of it being executed by means of a machine.

For men who are gifted with the powers of CUNNINGHAM and MILLER it would not be presumption if they attempted ornamental work, but the organisation of industry in this country is an obstacle to any effort of that kind. ALLAN CUNNINGHAM tells us that when he came to London sculpture was to him an unknown art, and he describes his feelings when he first saw CIBBER's *Madness* and *Melancholy* outside the asylum for insane in Moorfields. That, no doubt, was owing to the condition of Scotland, for no examples of the sculptor's art were visible on the roads of Dumfriesshire. But ALLAN wished to have sculpture of another kind besides formal statues. "Sculpture was," he wrote, "to Gothic architecture what the blossom is to the leaf. It was subordinate indeed to the masonry—or rather the conception of the whole was so much the effort of one mind, that the sculpture seemed tame when removed from the consecrated recesses, and the architecture without it appeared deprived of its chief grace." Why should not similar blossoming be allowed in modern architecture? CUNNINGHAM would have been able under favourable auspices to have executed such architectural sculpture as would enhance the masonry. But to use his own words, "It is singular how few have had the fortune to be put at the outset of life into the path wherein their genius lay."

We can hardly suppose that the Mediæval masons were always satisfied with building walls or even forming vaults. It is more likely that when an opportunity offered, which was frequently, they were capable of making the stones assume the forms of leaves or flowers. Only slaves should pursue monotonous operations year after year. If special sculptors had to be employed in the old churches and cathedrals the expenses might often be deterring, and there would be delays which were never likely to be overcome. In our time a CUNNINGHAM or a MILLER who desired to become something more than a layer of stones in courses would, if possessed of strong will, be able to acquire

the rudiments of sculpture and modelling in art schools without any large deduction from their wages. But their fellow workmen would rise in rebellion against them. Liberty of action is not allowed to reach such an extreme. The consequence is that clever masons are compelled to take up exhausting varieties of work, while building loses the services of men who could have conferred grace upon it and in that way increased its value. A Scottish proverb says, "Strive for a silk gown and you may have a sleeve of it." In the building trades men with ambition to prove their worth should not be manacled by the idle and lethargic.

#### CHARLESTON AND GEORGETOWN, U.S.A.\*

CHARLES II. was liberal in portioning out vast areas of North America among his friends. Every reader of romances remembers how Colonel HENRY ESMOND's family had in that way obtained an estate in Virginia, and it was on the beautiful banks of the Potomac that a new Castlewood was erected, which soon became the property of the WARRINGTONS. That grant may not be recorded in what are called histories, but in them we find it stated that about 1662 EDWARD HYDE, who was more familiarly known as Lord CLARENDON, and seven others were accorded possession of all the territory situated between 31° and 36° 30' north latitude, which was called Carolina. The proprietors formed for over half a century the only government. JOHN LOCKE, the philosopher, was secretary to them, and the manuscript still exists of the scheme of government for the colony which he drew up, and which was remarkable for its spirit of toleration. Nobody was to be disturbed, molested or persecuted for his religious opinions or way of worship. Nobody was to be a freeman or possess an estate or dwelling who was not, at least, a deist, but "any seven or more pastors agreeing in any religion shall constitute a church, to which they shall give some name to distinguish it from the others." So much freedom was not suited to that bigoted age. In 1719 the country was divided into North and South Carolina, and a royal government was established. Charleston was founded in 1680, and it remained the capital of the province until it was superseded by Columbia in 1787.

It is well to bear the dates in mind when we have to consider the architecture of the Charleston district. The houses recall not only England, but the age of SHAFTESBURY, CLARENDON and LOCKE, when the influence of INIGO JONES still prevailed. The English emigrants must have brought with them a love for refined architecture and esteem for English work at the end of the seventeenth and the beginning of the eighteenth century. But there was another influence which was derived from a nearer source, and that was the climatic conditions which made the verandah a necessity. Says Mr. C. R. S. HORTON:—

The Charleston we know to-day presents, architecturally, a quaint mixture of French and English ideas, together with some of the more salient ones of old San Domingo, in the way of exaggerated verandahs and high brick walls thrown in for good measure. The first two of these *motifs*—the French and the English—were inherited, naturally enough, from its earliest inhabitants, the English Cavalier and the French Huguenot, both of whom represented people of pronounced opinions as to what constituted domestic comfort and elegance. The San Domingo feeling came naturally and regularly enough, too, along with a lot of wealthy immigrants from the West Indian Islands who made their homes in Charleston, where the climate was not totally unlike that left behind them, and proceeded to make themselves comfortable in their own way. The houses built by these immigrants were usually spacious, with enormous two and three-storey covered verandahs as special features, though quite lacking in interior adornment. They were commonly surrounded by large grounds, around which high brick walls were built, after the manner of that surrounding the Simonton residence on Légare Street, which, with its great iron gateway, is one of the show-places of the city. These walls afforded the greatest privacy—a thing always of paramount importance with Charlestonians—and allowed the outsider no glimpse of the well-arranged garden within, with its gay masses of odorous opopanax, *rêve d'or*

\* *The Georgian Period*, being Measured Drawings of Colonial Work. Illustrations by E. Eldon Deane, E. P. Morrill and C. M. Bill. Part X. (Boston: American Architect and Building News Company. London: B. T. Batsford.)



roses and tropical palmetto bushes, among which the women of the family wandered informally at pleasure—or, if any, just a tantalising peep through the richly wrought entrance gates.

The verandah in Charleston exemplifies what EMERSON calls the poetry of columns. No objection can be made in those cases to superposing. Sometimes, as in the Nathaniel Heyward House, the Witte House and the Ancrum House, there is only one storey, and the verandah might be taken to be the façade of a chapel or public building in Italian style to which large timber additions had been made. A building which otherwise would be considered plain thus assumes importance. In the De Saussure House there are three ranges, and between the columns is balustrading. Generally unadorned Tuscan columns are used, but in the Horry House an Ionic order is also introduced above, and the spaces between the columns are halfway filled with latticework, which allows of privacy to the occupants. In Concord, near Natchez, which dated from 1789, only a single order was required for the two floors. The building was destroyed by fire a few years ago, but the view of it serves to explain how the builders became accustomed to elongated columns, and employed them for flanking doorways as well as in the interiors.

The exteriors have generally large gateways, which often show an ingenious combination of wood and iron, as in the Edmondson Gates. The wrought-iron work often brings to mind old houses in the suburbs of London, and it was usually imported from England, the initials of the owner of the buildings being introduced instead of the customary "G. R." As a rule the details are Italian, freely translated, but occasionally we meet with strange incongruities, such as a window in the form of a pointed arch, as in the pediment of Witte House, which suggest alterations by incompetent builders and ignorant owners. An oval window in a pediment is common.

The interiors occasionally exemplify more regard for design than the outsides. One of the houses, Friendfield, Georgetown, has the walls covered above the dado with one of those French papers which were used as substitutes for tapestry. Evidently it was intended to represent a view on the Seine. But truth was altogether neglected, for buildings were utilised which were found in other parts of Paris. The Porte St. Denis is assumed to be on the bank as well as the Panthéon. The towers of Notre-Dame are in the background, the Arc du Carrousel is also made to appear as a riparian structure. It was erected in 1806 and the wall-paper cannot be of older date. Various other familiar objects outside Paris are combined. On the left bank of the river pastoral and agricultural operations appear to be carried on, while some people are bathing. The paper was sold in small pieces, and the buildings of Paris, therefore, could be arranged and combined at the discretion of the hanger. It is an interesting relic of an old-fashioned wall-decoration, and is suggestive of the "pretty slight drollery, or the story of the Prodigal, or the German hunting in water-work" which FALSTAFF said was worth a thousand fly-bitten tapestries. All the mansions shown are indicative of opulence. Charleston was admirably selected for the purposes of trade. It was an excellent seaport and the country was fertile, especially for crops of tobacco and cotton. But labour in the fields in so warm a climate was not adapted to English physique. In Carolina slaves were a necessity prior to the invention of agricultural machinery. The Brewton slave quarters, which look like a transformed chapel, are reminiscent of the old condition of things when Africans were chattels. General WADE HAMPTON, of Carolina, is said to have owned no less than 3,000 slaves. With their aid wealth was not difficult to attain, and no doubt much of it was expended in erecting and adorning residences. JOSIAH QUINCY, in his account of the condition of Charleston in 1773, wrote:—"I can only say in general that in grandeur, splendour of buildings, decorations, equipages, numbers, commerce, shipping, and, indeed, almost everything, it far surpasses all I ever saw or ever expect to see in America." Emancipation and other causes have overcome the "royal merchants" and planters of South Carolina. Mr. ELTON DEANE, the architect, whose illustrations are the chief feature in the last part of "Colonial Architecture," lately visited Charleston. He has described its appearance in

detail, and of course enjoyed the evidence of imitation of English work in the houses. He sums up his observations as follows:—

I found it a proud old city, with every evidence of wealth and luxury in its past, but there is scarcely an estate upon which the inscription "Ichabod" could not be appropriately placed on its gate-posts. Without help, the spacious gardens are but poorly kept up, and reflect the all-pervading decay. As you behold all these big mansions, and after talking with their owners, you are manifestly impressed with the distinction of having a grandfather who helped to make history, but reflect that this they did because they could not very well help doing so, and while these good people have been dreaming of their family trees, the Northerners have been studiously pushing a way for their sons and daughters.

One of the American writers says that the Southern houses are "more lovable than any type of house we have," and in that opinion Englishmen, after studying the plates, are sure to agree. The wealthy planters must have had broad notions and confidence in the efforts of their architects to provide homes that would be at once comfortable and dignified. Like the other numbers of "Colonial Architecture" brought out by the *American Architect*, English influences are perceptible in the majority of the old buildings belonging to Charleston. The plates form therefore a supplement to the history of English architecture which has exceeding interest. In the British colonies there are now many places where the climate is as sunny for the greater part of the year as that of South Carolina. In such happy places the conditions which have to be met are similar to those which were realised in the Southern States. For modern architects the views of the American houses would have utility in suggesting solutions which were arrived at by skilful predecessors working amidst favourable circumstances.

#### CAMBRIAN ARCHÆOLOGICAL ASSOCIATION.

THE members of the Cambrian Archæological Association assembled at Brecon on August 18 for their annual meeting. The Association had twice before met at Brecon, in 1853 and in 1872. Sir Joseph Bailey, who was president at the last Brecon meeting, again took the chair this time, under his new title of Lord Glanusk. Whilst thirty years, says the *Manchester Guardian*, have made hardly any appreciable difference in the ancient monuments of the district, it is sad to think of the havoc that time has worked among the veteran archæologists who used to attend the meetings of the Association. Such men as Professor E. A. Freeman, Professor J. O. Westwood, J. H. Parker of Oxford, M. H. Bloxam, of Rugby, C. T. Clark, of Dowlais, and the Rev. E. L. Barnwell are no longer with us, and the present generation of Welsh antiquaries seem to be quite satisfied to quote from their writings. To those who have listened in awe-struck silence to Freeman's scathing denunciations of Parker because he had dated a particular architectural moulding 1187 instead of 1190, and to Parker's quietly sarcastic remarks in reply, a great change seems to have come over the Association in the past thirty years.

The whole of the district included in the four days' excursions, from Tuesday to Friday, is on the old red sandstone formation, and consequently the scenery is more uniform in character than in localities where several different kinds of rock crop up in succession close together, as is the case near Merthyr and other places on the edge of the Glamorganshire coalfield. Not only is Brecon itself on the old red sandstone, but the beacons, or vans, which form the most prominent features in all the surrounding views are also of the same formation. The highest peak—Pen-y-Fan, 2,910 feet above sea level, and 5 miles south of Brecon—is the loftiest old red sandstone summit in the kingdom. The Carmarthenshire Van, close to the boundary of that county and 15 miles south-west of Brecon, is a landmark of nearly equal importance, although about 300 feet less in altitude than Pen-y-Fan. On the Ordnance Map it will be noticed that the words "cefn" and "cwm" recur at intervals along the mountain chain to the south of Brecon, indicating a series of long rounded ridges covered with grass, alternating with deep valleys. The skyline of the Beacons is not unpleasing, though the forms of the peaks may appear somewhat fantastic to an eye accustomed to the more usual mountain tops of rugged slate or granite, or the peculiarly beautiful curves which show the results of glacial action. The special charm of the landscapes in the neighbourhood of Brecon lies in the gentle gradation from the fertility of the green meadows close at hand to the wildness of the mountains far away, whose barren places are toned down



to blue grey by the atmosphere so as to harmonise with the rest. During the excursions the members were delighted with an endless succession of panoramas, having as their main features the Usk in the foreground, with well-wooded hillsides along its banks, the rounded grassy uplands in the middle distance, and the purple masses of mountains beyond. The town of Brecon itself is not particularly attractive.

The prehistoric antiquities seen during the excursions were inferior both in quantity and quality to those in other parts of Wales where the meetings of the Association have been held. It is not altogether easy to explain this; certainly it would be unsafe to assume that all the important monuments have been destroyed. The prehistoric remains visited on the first day comprised only a menhir, or standing stone, near Battle, and an ancient British hill fort of the usual type, called the Crûg, lying two miles north-west of Brecon. On the second day the site of the crannog or lake-dwelling discovered on a small island near the shore of Llangorse Lake by the Rev. E. N. Dumbleton in 1869 was examined. It is interesting as being almost the only example in Wales of a kind of pile structure which is common in Ireland, Scotland and Switzerland. All that can now be seen is a row of piles sticking up above the surface of the water. On the same day, had time permitted, the party should have seen the remains of a chambered cairn on Manest farm, a mile south-west of Tall-y-Uyn Junction, known as Ty-Iltyd—that is to say, the House of Iltyd. The chamber has been denuded of the cairn which once covered it, exposing the large flat slabs of stone forming the sides and roof. The chamber was very possibly used as a hermit's cell at one time, and there are several small incised crosses, carved on the slabs either during the period of its occupation or by pious pilgrims to the spot after the cell had been deserted. Iltyd was a contemporary of St. David and St. Samson, and gives his name to Llantwit Fawr, in Glamorganshire. A large number of churches are dedicated to him in South Wales. A parallel case of the probable use of a neolithic burial chamber as a dwelling-place at a much later period is Wayland Smith's cave, in Berkshire, which is mentioned in a Saxon document of the eighth or ninth century.

The Roman station of Bannium, now called the Gaer, which was seen on the first day's excursion, is situated 3 miles west of Brecon, in a strong position formed by the junction of the river Yscir and the Usk. Extensive masses of masonry are still visible above the ground, and the plan of the fortification can easily be traced. From time to time Roman antiquities are found on the site, consisting chiefly of Samian ware, various other kinds of pottery, blue glass beads, coins, bricks and tiles. Some of the tiles are stamped "LEG II AVG." showing that the station was occupied by the Second Legion (Augusta), the headquarters of which was at Caerleon-on-Usk. Most of the relics found here were shown to the members on Friday, when they visited Ffrwdgrech, near Brecon, the residence of Mr. David Evans, the proprietor of the Gaer. If the site were to be systematically explored, it would doubtless yield a plentiful harvest of antiquities, and in laying bare the plan of the buildings and perhaps discovering inscribed objects, the excavators would certainly throw much light on the Roman occupation of Wales. At present, although most of the finds are preserved, no record seems to be kept of the exact spots where the antiquities were dug up. Near the Roman station of Bannium is a sepulchral monument, sculptured with the figures of a Roman soldier and his wife, known as the Maen-y-Morwynnion, or "maiden stone." It bears an inscription now nearly obliterated. There is another maiden stone near Benachie, Aberdeenshire, but this is an early Christian monument with interlaced ornament upon it. Then there is the Maiden Castle near Dorchester, and many other instances of the use of the word might be cited. Between the Gaer and Brecon there is an ancient paved trackway, which is called Roman, but may be of almost any age from the prehistoric period down to the time of Bernard Newmarch, the conqueror of Brecknockshire. Mr. F. Haverfield read a valuable paper on Bannium at the evening meeting on Tuesday. He said that, as far as outward appearances went, there had been no reconstruction of the walls, and that consequently the place had been occupied for a comparatively short period. To judge from the evidence of the coins found on the site, the period of occupation would be from about A.D. 70 to A.D. 120. After that time the country was no doubt subdued, and a strong garrison would be unnecessary. Mr. Haverfield strongly advocated the use of the spade as the speediest method of solving the various archaeological problems connected with the struggle between the stubborn Silures fighting for freedom amongst the fastnesses of the Brecknockshire hills against the might of Imperial Rome. At Penoyre House, the residence of Mr. R. D. Cleasby, near the Gaer, the party had an opportunity of examining one of the most beautifully cut Roman sepulchral inscriptions in Wales. Unfortunately the slab is broken in half, so that the ends of all the lines are missing, thus affording the assembled antiquaries an endless field for speculation. The stone was found a few years ago at Battle, near Penoyre, and also not far

from the Gaer. Other Roman inscriptions of inferior interest were seen during Thursday's excursion at Tretower and Scethrog.

The valley of the Usk between Devynock and the Grand Crickhowel contains an unrivalled series of inscribed and sculptured stones of the early Christian period, dating from about A.D. 500 to A.D. 100. In fact no district in Wales affords a better opportunity for the study of the development of monuments of this class. The series commences with the rude pillar stones, the inscriptions on which are simply debased copies of Roman epitaphs, differing from them in two respects—(1) that the letters are very ill-formed, and (2) the lines, instead of reading horizontally from left to right, read vertically upwards from bottom to top. It is true that there are about a dozen pillar stones in Great Britain with inscriptions cut horizontally, after the Roman fashion, but these are exceptions of very early date, as three of them have the Chi-Rho monogram and two contain the Roman formula "Vixit annos . . ." The Celtic fashion of making the debased Latin inscriptions read vertically upwards instead of horizontally probably arose from the fact that the ogham inscriptions must read vertically because they are cut on the angle of the stone; and as many of the monuments are both bi-literal and bi-lingual, it would never do to have the ogham inscription reading one way and the debased Latin inscription another. An example of a pillar stone with a debased Latin inscription entirely in capitals was seen on Friday's excursion at Devynock. The members had an opportunity of examining specimens of the bi-literal and bi-lingual inscriptions at Trallong on Tuesday and at Glanusk Park on Thursday. The most interesting feature of the Glanusk inscription is that it gives the rare ogham letter X as the equivalent for the Latin P. The inscribed stone at Llanfihangel Cwm-dû is a good instance of the transitional type in which several minuscule or small letters are mixed with the capitals. The inscription means, "Here lies Cattoc, son of Teyrnoc." Somewhere about the year A.D. 700 the capital letters ceased to be used and the inscriptions were afterwards entirely in minuscules. Oghams also became obsolete, and as there was no further reason for continuing to make the Latin inscription parallel with the ogham inscription, or vertical, the old Roman custom of cutting the letters in horizontal lines was reverted to. At the same time Celtic ornament and figure sculpture begins to make its appearance on the monuments. The best example near Brecon is the well-known cross slab of Briamail at Llandefaillogfach.

With the exception of Brecon Priory Church, which is too well known to need description here, the ecclesiastical architecture of the district is somewhat poor. Most of the churches have been either over-restored or rebuilt, so that very few old features now remain. Of the smaller village churches that at Llanfillo, with its finely-carved rood-screen and a doorway, having a highly-ornamented lintel, was distinctly the best worth seeing. Mediæval military architecture was represented by the round keeps of Brinllys and Tretower, which are of the thirteenth century, and are built on the same plan as those at Pembroke, Coningsborough in Yorkshire, and Coucy in France. At Tretower there is also a fortified mansion of the fourteenth century, built round a courtyard and having an interesting gateway and hall with a massive timber roof. Amongst the best of the papers read at the evening meeting was one by the Rev. S. Baring-Gould on his recent excavations at Clegyr Foia, the fortress of the pagan Irish chieftain who gave St. David such trouble when he first settled in Pembrokeshire.

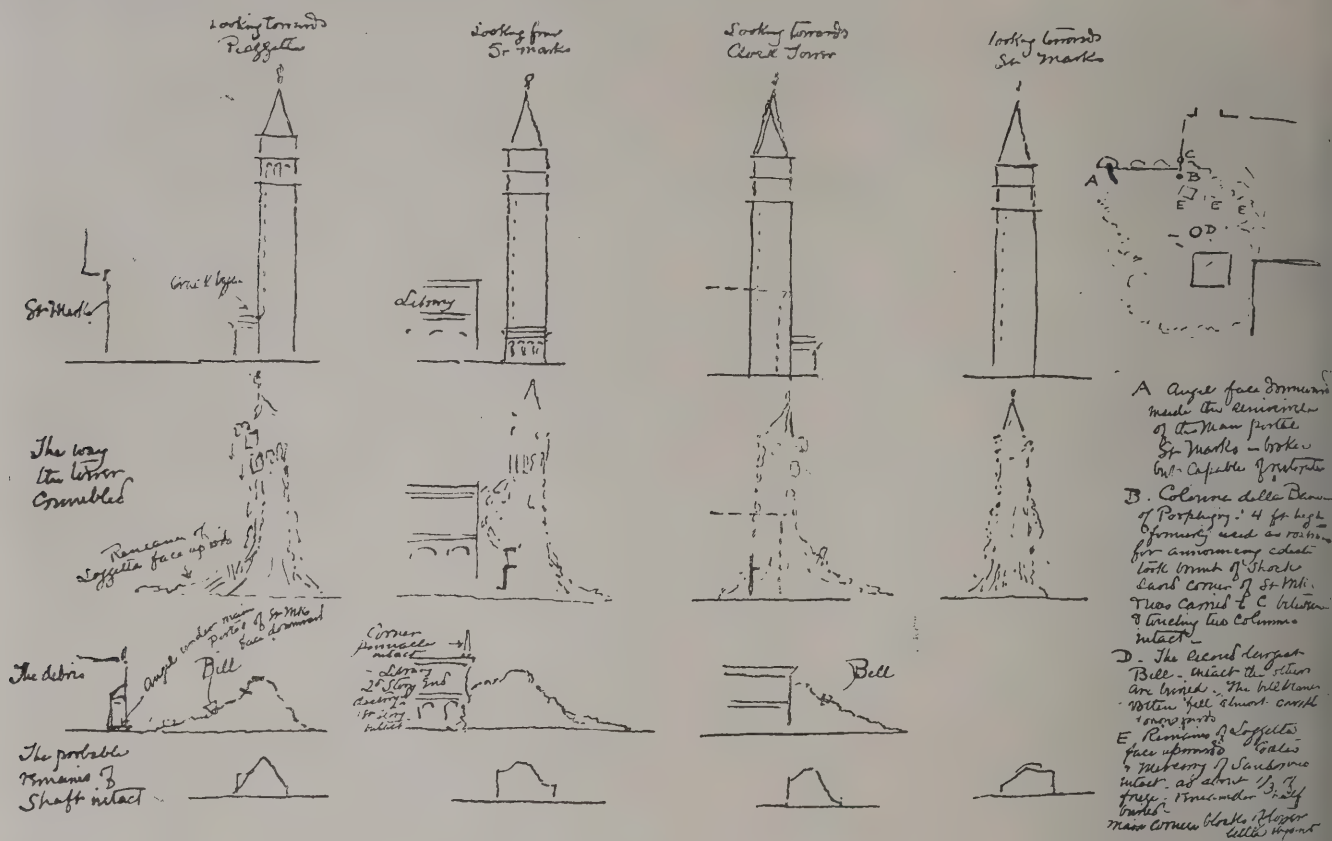
## THE CAMPANILE, VENICE.

A CORRESPONDENT to the *American Architect*, Mr. C. Howard Walker, was a spectator of the fall of the campanile. He sends to that journal a sketch, which we have reproduced as having historic interest, and with it the following observations:—

From a distance I saw the angel slowly descend, swaying, but upright, and my daughter and her governess were on the Piazza not 200 feet away. They both say that spurts of lime-dust puffed from the tower about 20 feet up from the ground, and that then cracks appeared at the base in the curtain-walls between the buttresses, which opened upwards with great rapidity, and the base of the tower spread "like the roots of a tree." There was little or no shock. The angel descended in an upright position until the cloud of dust rose and covered it, and must have come down full 100 feet before toppling. When found it was directly under and within the main portal of St. Mark's.

The Italians say the tower "se sedesse"—i.e. sat down upon itself. If there had been settlement it would have leaned. My own impression is this:—The top of the tower has been continuously repaired with new material; the bottom less so. The Loggetta concealed the condition of the bottom wall behind it, and it was neglected. The series of windows just inside the corner in order to light the stairs was always a structural weak-





ness in this type of tower. There has been work going on in flashing the roof of the Loggetta, which, while it seemed very slight and harmless under usual conditions, under these special conditions began to show great weakness at this point. This was acknowledged two months ago. The continuous repairs, &c., had produced in the brickwork, certainly of the outside walls, a state to which I can give no better definition than that it was a state of unstable equilibrium.

Energetic, organised action was imperative, and was not taken, from a lack of appreciation of the facts. I very much doubt if any action could have averted the disaster after the crack, which started at the lowest window towards St. Mark's a week ago, had begun to snap from window to window all the way up, because shoring-up would merely have transferred the weak point farther and farther up the shaft and to the right and left on the outer wall. But the miraculous thing is that St. Mark's is absolutely untouched—not a piece of mosaic fallen. The Colonne della Banda and the corner columns of the foundation were insecure. Certainly there would have been damage to St. Mark's. The library has at its end, in the second storey, two columns, with arches and entablature, torn out. The gates of the Loggetta, the figure of Mercury, and two of the carved blocks with putte are practically uninjured. The rest are buried still. I sincerely hope that America will liberally contribute. There has been a good deal of talk in Paris that re-erection of the old Campanile would not express the present advanced state of architecture, and some say that the Piazza is more harmonious without it. Fortunately, to my mind, no attention is being paid to these remarks. Venice has lost the foil, the contrast to the delicacy of its art. It was a noble foil, and dominated the long lines of the palaces from every approach. That the form of this vanished monument should be perpetuated is no mistaken conception.

In a letter to the *Times* the President of the Royal Academy writes:—

The expressions in the public Press have shown that the sympathies of the civilised world are with the Venetians in the catastrophe which has befallen them in the loss of their beloved campanile; especially do artists feel it as a personal loss, so conspicuously was it the key to the endless pictures which the beautiful city presents from wherever it may be seen, and so associated was it in our minds with the romance of its exquisite surroundings. Its rebuilding, as you have justly said, is a necessity, if only for its place in the panorama, and has been voted by acclamation.

A correspondent, in a letter which appeared in your columns on July 20, expressed a hope that the grief and dismay which the vast company of English who have visited Venice feel at this great calamity might express itself in the practical form of a subscription towards the reconstruction which, it is understood, is definitely decided on; and an editorial postscript to the letter in question suggested that the Royal Academy

should take the lead in organising this expression of our national sympathy.

In the attempt which we are now making to realise your suggestion it is not to be supposed that the Royal Academy doubts either the ardent desire or the capacity of the Italians, whether by a national subscription or by a grant from the Government, to carry to completion the restoration of this unique feature of the dignity and beauty of their world-renowned city. It is rather that we wish to offer our tribute of respect and regard to the Venetians, who always welcome us so hospitably, and to feel that we have had the honour of taking our share in making good a loss which is so universally deplored; and we hope that the thousands of our countrymen who owe so many happy experiences to Venice may so follow our initiative that England may play a substantial part in reconstituting the splendid ensemble which is so familiar to us.

It is to be regretted that there seems to be a technical illegality in the way of the Royal Academy using any part of its funds for such a purpose. I was therefore bound to make my appeal to the members of our body individually, and it was enthusiastically taken up, and has been warmly responded to by almost everyone with whom I have been able to communicate. The difficulty of finding them at this time of year when they are widely scattered has, I fear, caused some delay in forwarding to you the result of my appeal as far as it goes, but I am now able to send you a first list of subscribers from among the Academicians.

We now invite the co-operation of the general public, and if the Venetians are willing to accept our aid in this matter, I have little doubt but that there will be a liberal response from all sides.

Our treasurer, Mr. T. G. Jackson, R.A., has kindly signified his willingness to receive and keep in hand all donations sent to him and to deliver them to the proper authority when the time comes, and intending subscribers are requested to address their communications to him, at the Royal Academy of Arts, Piccadilly.

The contributions received will be acknowledged from time to time in the public Press.

First list of donations from members of the Royal Academy towards rebuilding St. Mark's Campanile:—Sir L. Alma-Tadema, 10*l.*; Edwin Abbey, 5*l.*; G. F. Bodley, 5*l.*; Thomas Brock, 5*l.*; H. W. B. Davis, 5*l.*; Frank Dicksee, 5*l.*; Luke Fildes, 10*l.*; Andrew C. Gow, 5*l.*; Peter Graham, 5*l.*; J. C. Hook, 5*l.*; T. G. Jackson, 5*l.*; B. W. Leader, 5*l.*; George D. Leslie, 5*l.*; J. Seymour Lucas, 5*l.*; W. W. Oulless, 5*l.*; Sir Edward J. Poynter, 10*l.*; Val. C. Prinsep, 10*l.*; Sir W. B. Richmond (conditionally), 5*l.*; Briton Rivière, 5*l.*; James Sant, 5*l.*; J. S. Sargent, 10*l.*; Marcus Stone, 10*l.*; W. Hamo Thornycroft, 5*l.*; J. W. Waterhouse, 5*l.*; Henry Woods, 10*l.*





### THE PRICHARD JONES INSTITUTE, NEWBOROUGH.

THE foundation stone-laying ceremony took place on the 16th inst. of the Prichard Jones Institute, Newborough, Anglesey, a building designed by Mr. Rowland Lloyd Jones, architect, Carnarvon, according to the instructions of the donor, Mr. J. Prichard Jones, whose desire was to build and endow in his birthplace an institute which should fulfil the purpose of a library, village club, and meeting place, and also should provide accommodation in which the aged people of the parish might spend their closing days in comfortable quarters and with pleasant surroundings. The site is on the road from Newborough to Gaerwen, and the institute will front the Menai Straits. Comprising some 26,000 square yards, the site will have three cottages or almshouses on each side. The quadrangle in front will be laid out as a garden. The architecture of the institute is Elizabethan in style, the cottages being arranged to harmonise. From the ground floor to the first floor the institute is to be of grey Anglesey granite, with dressings of Ruabon stone, and the upper part is treated in half timber, with two gables divided by a clock-tower over the entrance hall, which will be of granite to the domed roof, and this, with the finial, will be of copper. On the ground floor, to the west of the vestibule, is the library, 45 feet by 30 feet, and on the right a smoking-room and a coffee-room. Over the library is an assembly-hall of similar dimensions, and over the coffee-room a reading-room. All the necessary offices, such as kitchens, cloak-rooms and committee-rooms are provided. The cost of

the building and its furnishings will be about 6,000*l.*, while another 13,000*l.* will be required for its endowment.

### PYRMONT BRIDGE, SYDNEY.

WE have already described the construction and arrangements for working the new Pyrmont Bridge, Sydney. We now give a view of the roadway and parapets. The latter, it will be seen, are of a massive character. The bridge is almost sufficient to indicate the progress of the city, which has little more than a century of existence. In 1787 a fleet of eleven ships with about 750 convicts were sent, under the command of Captain Phillip, to found a colony in what is now called New South Wales. The intention was to use the shores of Botany Bay, but the land which Sir Joseph Banks had described as a Paradise was ascertained by less enthusiastic judges to consist mainly of swamps and sand. Port Jackson was therefore selected, the name being that of a sailor who was the first to discover the bay. The early days of the colony presented many hardships and riots of the convicts were common, but in 1803 it had so far advanced, a newspaper was established in Sydney. By 1820 the population of Sydney increased to 7,000.

In Sydney roads and bridges are under the control of a commissioner who is under-secretary for public works. The State is divided into sixty-two road districts, each being in the charge of a resident engineer. It is calculated that there are about 40,300 bridges and culverts. The improved condition of the roads has had a perceptible influence on the value of land and aided industrial pursuits throughout the country.



## NOTES AND COMMENTS.

THE authorities of Homburg some years ago decided to erect a memorial of the Landgraves, but the project was abandoned, for the sum required, at least 2,000*l.*, was not available. The sculptor who prepared the preliminary model and was to have the commission was Professor FRITZ GERTH. He is now engaged on a memorial of the Emperor WILLIAM I. The KAISER lately visited his studio to ascertain the progress of the work, and while there saw the sketch model of the Landgraves. HIS MAJESTY on hearing the story said the work must be carried out at his expense. The position for the monument has been arranged. The memorial will present portraits of eleven Landgraves who presided in Homburg between 1622-1866, besides portraits of Prince LEOPOLD, who was killed at the battle of Grossgorschen in 1813, and FREDERICK II., who was the restorer of the castle. The word "grave," which means grey or aged, was in early times a designation of judges, of whom there were many kinds. The Palgrave was a court judge who considered whether it was necessary for a case to be brought before the king. The Margrave was like our Lord of the Marshes and had care of the boundaries of the state, while the Landgraves settled ordinary lawsuits. In a great many parts of Germany the title of Landgrave was no more than an honorary distinction; but in Hesse Cassel and Hesse Darmstadt it was borne by members of the reigning families. The memorial in Homburg may therefore be regarded as a royal one, and on that account the Emperor has become responsible for its production.

THE report of Mr. F. PULLINGER on Science and Art classes has one paragraph which shows that under the modern arrangements of the Board of Education some of the teachers must now find less difficulty in making ends meet than formerly. He says:—"The system of paying Science and Art teachers by results has some interesting survivals in Yorkshire. I have come across cases in which teachers are paid at the rate of 18*s.* an hour. One teacher receives an income of well over 400*l.* for teaching five nights a week for about thirty weeks in the year. Another gets about 210*l.* for three nights a week throughout the same period. There is a case on record in which 4 guineas a night has been paid. Coaching at Oxford and Cambridge from first-rate men can be had at a cost of about 10*s.* an hour or even less. One can only hope that the teachers of evening classes in Yorkshire are men of superlative excellence. The matter is of considerable importance, as the payment of unnecessarily high salaries reacts upon the scales of payment which have been arranged for teachers of inferior qualifications. The chairman of a large school board has informed me that he has been compelled to pay much higher salaries since town and county councils have commenced their educational work." Nobody would grumble if the instruction were in all cases satisfactory, but when one of the examiners states that in the evening classes many pupils are to be found learning the rates of postage for letters, the cost of telegrams, and even the use of a Bradshaw's Railway Guide, when they could be so much more profitably employed, it is evident that science, art, and technology have assumed strange forms under the highly paid teachers.

THE Caerwent Exploration Fund is likely to receive an impetus in the right direction by the discovery on Friday last of the enormous number of 7,500 bronze coins. They are not all of extreme numismatic value, but they testify that in Venta Silurum there were people who tried to amass wealth. The hoard was unearthed in one corner of a room of a house which is being uncovered in the south-west portion of the city. The coins were all found loose, but they had probably been placed in a wooden bucket, one of the iron hoops of which was discovered with them. They all, as far as a cursory examination shows, belong to the fourth century A.D., and are of the smallest size current at that period, the total weight being only about 21 lb., which gives an average of about 20 grains per coin. All of them had apparently been in circulation.

## ILLUSTRATIONS.

LLOYD'S BUILDING, FENCHURCH STREET, E.C.: THE LIBRARY.

HOUSES IN PARK STREET, GROSVENOR SQUARE, W.

THESE six houses and the corner public-house, known as the Hertford Arms, have recently been erected in Park Street, W. Each house contains a kitchen, butler's pantry, and the usual offices in the basement; on the ground floor there is a morning-room and dining-room with the main staircase centrally situated, and back stairs in connection with same. On the first floor there is a drawing-room in front and a boudoir at the back, and on the remaining floors there are altogether eight bed-rooms, bath-room, &c. The stone dressings were executed in Portland (Whitbed) stone, and the red brick facings were obtained from Messrs. T. LAWRENCE & SONS, of Bracknell. The roofs were covered with the best Broseley tiles. The builders were Messrs. W. CUBITT, of 258 Gray's Inn Road, W.C.

DESIGN SUBMITTED FOR REBUILDING OF WESLEYAN CENTENARY HALL, BISHOPSGATE STREET, E.C.

THIS formed the subject of a limited competition for the new Wesleyan Centenary Hall in Bishopsgate Street, and the instructions to architects contained the following ideas of the trustees:—"The trustees do not wish to bind the competing architects to any particular scheme for the new building; but the arrangement they at present have in their mind is to arrange the ground floor and basement for letting to a bank, insurance company, or other large corporation, with a separate and exclusive entrance. To allot the first and second floors to the church departments, and the remaining available space for rooms suitable for letting as offices, with rooms for caretaker at the top. To approach the church premises and the offices over by a staircase and lift at the opposite end of the façade to the bank entrance, this portion to have a secondary staircase. The entrance to the church department, and the elevation generally, to be sufficiently monumental in character to comply with the trust-deed already referred to. The front elevation to be designed as one building, and the materials to be Portland stone and granite." The instructions then set forth the detailed accommodation required. It will be seen that an endeavour was made to express outwardly the various portions of the building, namely, the great banking hall on the ground floor, the large committee-room on the first floor, extending the whole width of the façade, and the three floors of offices over. The design illustrated was submitted by Messrs. BANISTER FLETCHER & SONS. It was one of the two designs premiated by Mr. ASTON WEBB, A.R.A., the assessor, and was exhibited in the Academy of 1902.

CHURCH OF ST. GERVAIS AND PROTAIS, GISORS.

THE town of Gisors, in the Department of Eure, is not often visited by English tourists. It is, however, connected with English history. HENRY II. erected the donjon in the twelfth century, and it was in Gisors that the French and English kings resolved to join the Crusaders. Besides the castle there is another Mediaeval work, the church which was dedicated to St. Gervais and Protas. It now represents the styles of the thirteenth, fourteenth, fifteenth and sixteenth centuries. The view which we give suggests that the builders in the later period endeavoured to show that Renaissance details were not out of keeping in a Gothic building. It is needless to say that the two styles cannot be successfully combined, and at Gisors there is variety rather than unity. The great doorway has, however, picturesqueness, but in the northern doorway Renaissance alone has been used. In the interior there is much beautiful carving. The Tree of Jesse is about 50 feet high. One of those fleshless figures which are often found in foreign churches is attributed to JEAN GOUJON. A series of medallions painted in the sixteenth century deal with the legends of the patron saints. The church deserves more attention than it has received. It is one of the buildings controlled by the Commission of Historic Monuments.



## SOME OXFORD COLLEGES.\*

*University College.*

UNIVERSITY College was founded by William of Durham in 1249, who bequeathed to the university 310 marks in part for purchasing annual rents to maintain a certain number of masters for the study of theology in Oxford, and who were to be natives of Durham or that district. The first house purchased was Little University Hall, in Schools Street, where probably the masters were located. Shortly after Drowda Hall, opposite the present college, in High Street, was acquired; another hall in Schools Street in 1262, and two to the east of the college in 1270. In the reign of Edward II. the masters purchased, or had given them, other houses, some of which now form the site of the college. The management appears to have been regulated by the university in congregation until 1280, when the masters received, under the name of "The Hall of the University," their first statutes and power of self-government.

The college commands a very imposing position in the High Street. The principal entrance has richly-roined vaulting, over the gateway being a statue of Queen Anne, and on the inside one of James II., put up in 1687. The west side of the first quadrangle, which is 100 feet square, was built in 1634, the north side fronting High Street in 1635, and the hall and chapel on the south a little later, the buildings on the east not being erected until 1665. The inner quadrangle was completed in 1719 and contained the master's lodgings and fellows' rooms. They were built from a bequest by Dr. John Radcliffe (physician to William and Mary and founder of the Radcliffe Library), Queen Mary's statue being over the entrance gateway in High Street and that of Dr. Radcliffe facing the quadrangle.

The building of the chapel was commenced early in the seventeenth century, but remained unfinished during the Civil Wars. It was consecrated by Walter Blandford, Bishop of Exeter, on March 25, 1665. The marble pavement was laid in 1692, and the panelling and exquisitely carved screen, in the style of Grinling Gibbons, by Barker, were put up in 1694. The chapel was restored and remodelled by Sir G. G. Scott, R.A., in 1862, when the beautiful panelling at the east end was removed to the bursary. The windows on the north and south sides are by Van Linge the younger, and were put up in 1641. There is other glass painted by Henry Giles, of York, in 1687, and presented by Dr. Radcliffe, and the east window presented by Dr. Plumtre (master) in 1864.

The hall was finished about 1657. It was refitted in 1766, when the present wainscoting bearing the arms of the contributors to the work was added. At the same time the existing coffered ceiling with fan tracery was put up, concealing a fine open-timbered roof with louvre, and Sir Roger Newdigate gave the fireplace, the design of which is taken from a monument in E. Cathedral. Among the portraits on the walls are the following:—George Abbott, Archbishop of Canterbury (master), John Potter, Archbishop of Canterbury, Bishop Bricroft (master), Dr. John Radcliffe, Sir Roger Newdigate, by Kirkby, William Scott, Lord Stowell, by Hoppner, John Sturt, Earl of Eldon, by Owen, Marquis of Hastings, 1771, by Hoppner, Dean Stanley, by Eddis, and Frederick Plumtre (master, 1836-70).

The old library with its picturesque high-pitched roof, and the kitchen under, was built in 1668-70, and is still standing, the library being fitted up as dwelling rooms.

The present library was built by Sir G. G. Scott, R.A., in the Decorated style, from funds provided by the executors of Lord Eldon, grandson of the Chancellor. In it are colossal statues of Lords Stowell and Eldon which have a strange history. They were designed by Sir Francis Chantrey in 1840, and died in the following year before anything was done to the work. The sculpture was commenced by Allan Cunningham, who died in 1842, continued by L. Watson, who died in 1843, and completed by Nelson.

The College MSS., 193 in number, dating from the twelfth century, have been placed in the Bodleian Library on loan. The library contains many rare and valuable works, among them the St. Augustine's "De Civitate Dei," 1473; a Sarum Missal, printed by Regnault, 1534, and many others.

The senior common-room was first used in 1679. The fine old carved panelling by Barker was put up in 1697. In it is a bust of Alfred, and portraits of Henry IV. and Essex, by James Griffith (master, 1807-21).

The master's lodgings were built in 1879, from designs by Boy & Garner, and form one of the finest residences in Oxford.

The buildings in the north-west corner of the college were erected in 1842, on the sites of Deep and Staunton Halls, from designs by Sir Charles Barry. On the intervening space, approached by a passage from the front quadrangle, is a chamber

with domed roof, erected in 1896 from designs by Basil Champneys, to contain the beautiful statue of the poet Shelley, by Onslow Ford, R.A., presented to the college by Lady Shelley.

No history of University would be complete without mention being made of the myth of King Alfred's connection with the college as its founder. In the annual calendar issued by the university, the college is said to have been founded by Alfred the Great in 872; and on June 12, 1872, the college celebrated with great pomp its alleged millenary. Ralph Higden, writing in 1363, says:—"Alfred was the first to establish schools for the various arts in Oxford, to which city he granted privileges of many kinds." James Parker, in his "Early History of Oxford," says:—"Asser, who was Alfred's contemporary, and has written a very full biography of him, knew nothing of the foundation (by Alfred), nor did any of the many writers who followed Asser until Edward III.'s time; the myth then suddenly springs into existence." In Alfred's will, in which names of upwards of fifty places are given, no mention is made of Oxford; and in the original documents connected with William Durham's bequest and foundation the existence of an earlier foundation is not referred to. From all we know of Alfred, and particularly of the care he took for the advancement of learning in England, he may have taken an active interest in the university and perhaps have established schools at Oxford, but that in no way proves him to have been the founder of University College, and of this important fact no title can be found.

*Queen's College.*

Queen's College was founded in 1340 by Robert de Eglesfeld, warden of St. Julian's Hospital, Southampton, and rector of Burgh, Cumberland. He was chaplain and confessor to Philippa, queen consort of Edward III., and in her honour called it "Aula Scholarium Regina in Oxon." The foundation was to consist of a provost and twelve scholars, or fellows—having reference to Our Lord and His Apostles—to be natives of Cumberland and Westmorland. The advowson was vested by the founder in the name of his royal mistress and in successive queens consort. Queen Henrietta Maria, Queen Caroline, Queen Charlotte and Queen Adelaide were among the benefactors of the college, and Queen Alexandra is a patron.

The main front of the college originally faced Queen's Lane. Temple Hall, the first residence of the scholars, stood on the site of the present college stables, but none of the early buildings now remain. The front in High Street was built in 1750-56 from designs by Nathaniel Hawkesmore. Over the entrance gateway is a cupola, supported by a double row of columns, containing a statue of Queen Caroline, consort of George II. The whole of the present buildings are in the Classic style.

The foundation-stone of the chapel was laid on February 6, 1714, the anniversary of Queen Anne's birthday. The east end is apsidal, the glass in the centre window representing "The Holy Family," painted by Joshua Price after Carlo Maratti. Of the other windows, six were painted by Abram Van Linge in 1635 for the old chapel; the two on either side of the west end are dated 1518. Over the altar is a copy, said to be by Mengs, of Correggio's "Night," in the Dresden Gallery. The painting on the ceiling is by Sir James Thornhill, and represents "The Ascension." There is a fine carved screen supported by Corinthian columns. The eagle lectern bears the date 1653, and the inscription "Regina avium, avis Regniensium" ("The bird of Queens is the queen of birds"). Two brass chandeliers hang from the ceiling that were given in 1721, and after having been lost for many years were recently found at Birkenhead and returned to the college.

The hall was erected about 1710 from designs by Sir Christopher Wren. On the walls hang portraits of Henry V., Edward the Black Prince, Edward IV., Charles I., Philippa (consort of Edward III.), Henrietta Maria (consort of Charles I.), Charlotte (consort of George III.), Caroline (consort of George I.), Robert de Eglesfeld (founder), John Michel (benefactor), Dr. Halton (provost 1677), Dr. Lancaster (provost 1704), Joseph Addison and others. The windows contain portraits of the founder, Edward III. and his queen, Edward IV. and Henry V., Charles I. and his queen, and Charles II. and his queen.

In the minstrels' gallery are other portraits and some interesting prints of the college before it was rebuilt. The old custom of bringing in the boar's head decked with bays and rosemary, to the singing of an old carol, is observed in the hall every Christmas Day, commemorating an act of valour performed by a student of the college, who, whilst walking one Christmas morning over Shotover Hill, studying Aristotle, was attacked by a wild boar, and with great presence of mind killed the infuriated beast by thrusting the philosopher down its throat. The memory of the founder is retained by another old custom. On New Year's Day the bursar presents each member of the college who dines in hall with a needle and

\*A paper read by Mr. Frank E. Spiers before the members of the Upper Norwood Athenæum at Oxford.



thread, saying "Keep this and be thrifty," it being a rebus on Eglesfeld's name (*aiguille et fil*).

The library is one of the finest in Oxford. Dr. Barton (Provost 1657, Bishop of Lincoln 1675), at one time keeper of the Bodleian, bequeathed the greater portion of his library to the college in 1691, and in the following year the present library was commenced, great part of the cost being borne by Dr. Halton, the provost, who also gave his collection of books. Dr. Mason, who died in 1841, bequeathed to the college his valuable library and collection of antiquities, and the sum of 30,000*l.* for the purchase of books, and in consequence the lower library was added in 1845-46. There are upwards of 94,000 volumes in the library. The ceiling is elaborately decorated in plaster, and the carving of some portion of the book-cases and the two handsome presses in which the MSS. are kept is by Grinling Gibbons. A curious statue of Queen Philippa that used to be in the hall, but on its removal was lost or disposed of, was discovered at Wolvercot in 1891 and returned, and is now in the library. The north window contains the portraits of Henry V. and his uncle, Cardinal Beaufort, under whom he studied. This glass was originally in a window of the rooms occupied by the Prince when in residence at Queen's. For many years it was lost sight of, but was recovered by Alderman Fletcher, of Oxford, and restored to the college.

#### *Oriel College.*

Oriel College, originally entitled "The Hall of the Blessed Mary at Oxford," was founded by Adam de Broome, almoner to Edward II. He was presented by the king to the rectory of St. Mary the Virgin in 1320, and on April 28, 1324, he obtained letters patent from the king to found a college for scholars in Oxford. He purchased Tackley's Inn (now 106 High Street) and Perilous Hall, in Broad Street, for the purpose, and appointed John de Laughton first rector. On January 1, 1325-26, Adam de Broome, in order to give greater stability to his college, surrendered it to the king, who, on the 26th of the same month, granted its first charter, in which he connected himself with the foundation. By the statutes, which bear the same date, the college was to be governed by a provost, and Adam de Broome was appointed by the king to the post. The college was re-endowed by the king, and the revenues of St. Mary's Church were appropriated to its use. At this time the scholars were removed to the rectory of St. Mary's Church, now St. Mary's Hall. On May 23, in the same year, new statutes were issued in the king's name placing the college under the direct patronage of Henry de Burghash, Bishop of Lincoln. Adam de Broome died January 16, 1332, and was buried in St. Mary's Church. In 1327 the college acquired Senescal Hall, known as "La Oriole," standing at the corner of Schidyrd Street (now Oriel Street) and St. John Street (now Merton Street), the site of the present front quadrangle. From a colloquial appellation "Oriel" ultimately became the name of the college. Other tofts and tenements north of this and extending west to Grope Lane (now Grove Street) were acquired before the end of the fourteenth century. Bedel Hall, to the south of St. Mary Hall, was added in 1452, and St. Martin's Hall, the site of the present chapel, in 1502, these completing the whole of the present site. There were ten open fellowships on the original foundation. In 1440 John Frank left 1,000*l.* for four additional fellowships, one each for the counties of Dorset, Somerset, Wilts and Devon; in 1441 Provost Carpenter endowed one for Worcester, and later Bishop William Smythe one for Lincoln. The Scholars or Fellows were, until 1584, all graduates who had passed their bachelor degree. After that date commoners were admitted as members. For many years there had been a few exhibitions connected with the college, and at times paying scholars; these had been lodged in St. Mary Hall. About 1586 St. Mary Hall was severed from the college, though a certain connection between the two establishments was always kept up, the principals of the hall having invariably been Fellows of Oriel.

During the provostship of Anthony Blencowe (1574-1618) it was resolved to rebuild the college. Blencowe left 1,300*l.* for that purpose, and in 1619 the work was commenced, it being completed in 1642.

The west and south fronts were pulled down in 1619-20, and immediately rebuilt, the north and east sides of the quadrangle, including the hall and chapel, being rebuilt in 1636-42.

The hall occupies the east side of the quadrangle, and is entered from a flight of steps under a large open portico bearing the inscription "Regnante Carolo." Over the entrance are statues in canopied niches of Edward II., the Royal Founder, and Charles I., surmounted by the figure of the Virgin and Child. It is a fine hall with hammer-beam roof and louver, the lower part of the walls being panelled in oak. At the south end is a Gothic screen, with minstrels' gallery over the vestibule. Among the portraits on the walls are the following:—Edward II., Queen Anne, Sir Walter Raleigh, Charles, Duke of Beaufort, John Rowse (Bodleian Librarian), Bishop Robinson (Fellow 1675-86), Joseph Butler, Bishop of Durham

(Graduate 1718), Bishop of Dromore (Fellow 1798), John Keble (Fellow 1811), Whateley (Fellow 1811) and Thomas Arnold, of Rugby fame (Fellow 1815). The college is fortunate in having preserved the founder's cup, in silver gilt, bearing the initials E, the mazer bowl and cocoanut cup mounted in silver, given by Provost Carpenter, 1435, and other valuable pieces of old plate.

The church of St. Mary the Virgin served the purpose of chapel until the end of the fourteenth century, when a license was obtained to celebrate Mass in a chapel or oratory to be built within the college. This was erected on the south side of the quadrangle opposite the present gateway of Corpus Christi College, at the cost of the Earl of Arundel and his son the Bishop of Ely. The present chapel was built on the site of St. Martin's Hall, and opened for Divine service in 1642. It has undergone several restorations from time to time, the most important being in 1884, when, under the care of Mr. T. G. Jackson, R.A., the present east window was inserted to the memory of Provost Hawkins, the screen was moved further to the west, and the chamber that had formed Newman's oratory was thrown into the chapel to form the organ loft. The bronze eagle was given in 1654.

In the inner quadrangle the rooms on the right were built by Bishop Robinson in 1721, those on the left having been built out of a fund bequeathed by George Carter (provost 1708-27).

Lord Leigh, of Stoneleigh, having bequeathed the whole of his valuable library to the college, the rooms previously used as the library were not large enough, and the present Class building was erected in 1787-88 from designs by James Wyatt. It contains a good collection of MSS. and printed books, the most of special interest being an Aurelius Prudentius, probably 10th century; MS. of Eusebius, 12th century; MS. of Pie Ploughman; Cicero's "De Officiis," printed at Mainz; the rare "Egidius, "De Peccato Originis," of which only two other copies are known to exist; several folio volumes containing rare prints, and a first folio Shakespeare, given by Lord Leigh. There are also busts of Edward II. and John Copleston (provost 1814-28), and a chair formerly belonging to Gilbert White of Selborne.

Under the library are the two common rooms, which are rendered specially interesting by the large collection of portraits of old Oriel men they contain, and also for discussions and events that have taken place within their walls. The portraits are so numerous that only a few of the most important can be mentioned here:—Edward II., Bishop Smythe, Sir Walter Raleigh, Chief Justice Holt, Thomas Arnold, John Eveleigh, Bishop Butler, William Prynne, Benjamin Brummell, John Keble, Bishop Copleston, Dean Church, Dean Ireland, Cardinal Newman (by Oules), Edward Hawkins, Matthew Arnold, J. Anthony Froude, Lord Herbert of Lea, Bishop Wilberforce, Bishop Stubbs, Dean Burgon, Lord Balfour of Burleigh, Thomas Hughes, Goldwin Smith, Gathorne Hardy and Cecil Rhodes (by Coke).

By the recent death of the Rev. Dr. Chase, late principal of St. Mary Hall, under a statute made by the last University Commissioners, the Hall now becomes incorporated with the college. This will enable the trustees under the will of the late Cecil John Rhodes to extend the college buildings to the High Street, an extension necessitated by the large number of colonial and other scholarships created by Mr. Rhodes' munificent benefactions.

#### *Merton College.*

Merton College was founded in 1264 by Walter de Merton, Lord High Chancellor to Henry III. and Edward I., and Bishop of Rochester. He was born at Merton, in Surrey, whence he took his name, and received his education at Meon Priory and Oxford. His college, which was the first self-governing corporate community in Oxford, and may therefore claim to be the oldest collegiate establishment, was founded in connection with a "House of Scholars" at Malden. The Oxford scholars were first lodged in hired dwellings, but during the years 1266-68, with the support of the king, to whom the founder had great influence, the site of the present buildings was acquired, together with the appropriation of the church of St. John the Baptist. The founder's first statutes for the government of his two houses were dated 1264 and were revised by him in 1270. He transferred the Malden House to his college at Oxford in 1274, when he gave an enlarged code of statutes to the college which bore the seal of the king. So complete were these statutes that they were generally accepted as a model by the early collegiate foundations of Oxford and Cambridge. Walter de Merton was Chancellor to Henry III. in 1258 and again in 1260. Having the seals of office on the death of the king he became practically regent until Edward returned from his crusade in 1272. He then delivered up his seals and devoted himself entirely to his college prior to taking up his episcopal duties at Rochester. He died in 1277, leaving 1,000 marks and the residue of his large estate to his college, and was buried in Rochester.



hedral. His foundation was confirmed by the Bishop of  
coln in 1276 and received the solemn confirmation of  
e Nicholas III. at Rome in 1280. A second charter was  
nted by Henry VI. in 1444. John Wyllyot, who was a  
w of the college in 1334 and Chancellor of the University  
r 1349, instituted in 1380 an order of poor scholars, or  
ibitioners, called "portionists," now known as postmasters,  
y were until about 1600 housed in a hall opposite the col-  
e, where subsequently Anthony Wood was born. In 1479  
moners were first admitted to the college. Queen  
harine of Aragon visited the college in 1518, Queen  
abeth in 1592 and James I. in 1602. Charles I. was a  
uent visitor, first in 1619 with his queen and in 1643,  
le Queen Henrietta Maria stayed in Merton, Charles was  
ed at Christ Church for three years. During this time and  
le the Parliament was held at Oxford, the fellows of Merton  
ear to have had great influence on events in Oxford.

The gateway and tower were built in 1418; over the  
erance is a curious old sculpture representing St. John  
Faching in the Wilderness, said to have been taken from the  
ol church of St. John the Baptist, having on either side a  
copped niche containing figures of Henry III. and the  
rider. The college front on the left of the gateway was  
uilt in 1588-91, St. Alban's Hall 1599, and the buildings on  
t right in 1631, the whole of the front having been restored  
in 1838.

The old refectory was built towards the end of the thir-  
e-th century. It was almost entirely reconstructed in 1790-  
4 the only old work that was retained, besides the shell, being  
h doorways and the old north door of oak with its beautiful  
eenth-century iron hinges. It was carefully restored by  
Si G. G. Scott in 1872-74, when the present open timber roof,  
pelling and oak screen were put up and the original character  
of the building somewhat reinstated. A minstrels' gallery  
occupies the west end over the entrance vestibule. Among  
h portraits on the walls are those of the founder, Duns  
Stus (a copy of the portrait in the Bodleian), Sir Henry  
Salle (Warden 1586-1622), Sir Thomas Bodley (Fellow 1613),  
Bishop Barrington (Fellow 1755), Bishop Denison (Fellow  
1761-37), Dr. Marsham (Warden 1826-80), Hon. Geo. C.  
Bidrick (present Warden), painted by R. W. Macbeth,  
A. A., and others.

The treasury is the oldest part of the college; it is built  
nely of stone with an ashlar roof, is fireproof, and was pro-  
bay the counting-house of Jacob the Jew, from whom the  
rder purchased this portion of the site.

The parish church of St. John the Baptist, which existed  
pr to the foundation of the college, was granted in 1266 to  
h scholars of the House of Merton by the Abbey of Reading,  
an has since formed the chapel of the college. The parish ser-  
vices continued to be held here until 1891, when they were trans-  
ferred to St. Peter's in the East and the two parishes incorporated.  
On the north door are statues of St. John the Baptist and  
th Virgin Mary. The choir was rebuilt in 1294-97, the win-  
dws being remarkably fine examples of Early Decorated  
wc. The tower is a little later, and the transepts were built  
in 1360 and completed in 1424-25. The beautiful bell tower  
was finished in 1451. The founder's design was probably to  
ad a nave and aisles, but this intention was delayed, owing  
paly to the want of funds, and subsequently the ground to  
th west of the chapel was sold to Corpus Christi College,  
wn all hopes of the completion of the building were  
deroyed. The present form of building with choir and tran-  
se, or ante-chapel, appears to have served as the model for  
otr college chapels. Besides the high altar, which was  
de cated in 1277, there were originally four other altars in the  
ch. There is a piscina, with a curious quatrefoil squint in  
th recess above, and handsome sedilia in the choir, and also  
ach piscina in the south transept. The stained glass in the  
ro of east window was inserted in 1671; that in the lower  
pa, representing events from the life of Our Saviour, was  
pated by W. Price in 1702. The glass in the north and south  
winds of the choir was given by Henry de Mamesfeld in  
12. The west window contains some fifteenth-century glass.  
The ceiling of the choir was put up in 1497, and redecorated in  
18 from designs by the Rev. J. Hungerford Pollen, a Fellow  
of the college. The transepts were ceiled in 1517-18. The  
alt piece, representing the Crucifixion, said to be by Tintoretto,  
wa presented in 1779. The stalls were put up in 1851 and the  
bra lectern given in 1458. There are two fine brasses in the  
ch; that on the north side being to the memory of John  
Blham (Warden 1375-87) and John Whitton, rector of  
Wdeaton (a benefactor), and that on the south to Henry  
Seir (Warden 1455-71). In the north transept is a good brass  
to chard de Hakeborne, c. 1311, and mural monuments to  
Sir Thomas Bodley, Sir Henry Savile, Bishop Earle, Sir  
Anthony Wood, ob. 1695, and many others.

The sacristy, adjoining the chapel, was built in 1311. It  
wa n 1827 perverted to the use of the college brewhouse, but  
in 78 was refitted, and since then the valuable MSS. have  
be kept there.

The library is probably the oldest example of a Mediæval  
library in England. It was built and given to the college by  
William Rede, Bishop of Chichester, in 1377-79. It comprises  
two rooms on the west and south sides of Mob Quadrangle,  
connected by a vestibule. The waggon vaulted ceiling was put  
up in 1502-3 by Warden FitzJames and bears his arms (a dol-  
phin), the Royal arms, Tudor rose, &c. It is lit by the original  
lancet windows and dormer lights added later. The rough  
hewn benches, bookcases in west room and half-case numbered  
45, having the old chains still attached to the books, as was the  
case throughout the library until 1792, and the glass bearing  
labels "Ecce Agnus Dei," are all original work. In 1623 the  
open space at the end of the south wing was added by Warden  
Brent, the dormer windows were inserted, the screens and other  
woodwork was put up, and the encaustic tiles laid in the gang-  
way. The glass in the east window, bearing date 1598, was  
given in 1841. The college has been fortunate in preserving  
no less than 347 of its old MSS. though many have disappeared.  
A large number were disposed of, or destroyed, by Edward  
VI.'s visitors in 1550, among them 65 out of the 99 given by  
Bishop Rede. The library contains over 18,000 volumes, among  
them being the works of Duns Scotus, St. Augustine, St.  
Gregory, St. Thomas Aquinas, St. Jerome, Arabic MSS., a fine  
copy of the first Caxton edition of Chaucer, "The Tatler," given  
by Robert Steel, and many others. It is particularly rich in  
theological, mathematical, astronomical, physical and philo-  
sophical works.

The buildings on the north and east sides of Mob Quad-  
rangle are probably c. 1311. The warden's house dates from  
1483, but it has had many alterations and additions, the last in  
1836-38.

The Fellows' quadrangle was built in 1608-10 by Thomas  
Holt, who was responsible for the old Schools and Wadham  
College. The fine entrance gateway, with groined vaulting and  
the queen's chamber above, bears the arms of James I. and  
the founder, and displays the Doric, Ionic, Corinthian and  
Composite orders of architecture.

The first Fellows' common room in Oxford was established  
at Merton in 1661 in its present room above the kitchen, with  
cock-loft over it. It was panelled in 1671-80 and ceiled in  
1762. On the walls are portraits of John Chambers (Warden  
1525-44), Bishop Jewell (1559-71), Burleigh, Abraham Cowley  
(poet), Wyclif and others.

St. Alban's Hall, now part of the college, was the residence  
of Robert de St. Alban early in the thirteenth century. He  
gave it, with Nunne Hall adjoining, to the convent at Little-  
more. It was confiscated at the Dissolution, purchased in 1549  
by Merton College, and was kept up as a separate establish-  
ment until 1881, when, under the statutes of the University  
Commissioners it was incorporated with the college.

The new buildings in the Grove are from designs by  
Butterfield. They were opened June 15, 1864, when the sex-  
centenary of the foundation of the college was celebrated.

The gardens are exceedingly picturesque, with charming  
views of Christ Church Meadows, the Cathedral, Magdalen  
Tower, &c. They are bounded on the south and east sides by  
the old city walls and bastions. (The old mulberry tree was  
planted c. 1620.)

#### *Corpus Christi College.*

Corpus Christi College was founded in 1516 by Richard  
Foxe, Bishop of Winchester and Lord Privy Seal to  
Henry VII. and Henry VIII. In his statutes of the following  
year he dedicated the college to "The praise and honour of the  
most precious Body of Christ, of His Spotless Mother, &c." Hugh  
Oldham, Bishop of Exeter, gave 6,000 marks towards  
the cost of the building. Bishop Foxe was the first to make  
provision for the study of Greek in the university by the insti-  
tution of a public professorship for that purpose.

The college adjoins Merton on the west, the site having been  
purchased partly from that college. Over the entrance gate-  
way, which has a very beautiful vaulted roof, is a curious  
carving representing angels bearing the Host, or Corpus  
Christi, in a monstrance, with the arms of the founder and the  
See of Winchester on either side. On entering, a conspicuous  
object in the centre of the quadrangle is a cylindrical sun-dial,  
designed and presented to the college by Charles Turnbull,  
a Fellow, in 1605, and which forms a perpetual calendar. It  
bears the arms of Henry VIII., the University, Bishop Foxe  
and Bishop Oldham, and is surmounted by a pelican, the crest  
of the founder and badge of the college.

The quadrangle was completed in 1517, embattled in 1609,  
and an additional storey added to the north and west sides  
in 1737.

On the left is the hall with a fine hammer-beam roof, a  
good specimen of Late Perpendicular work. The wainscoting  
and screen was put up in 1700. On the walls are portraits of  
the founder painted on panel by a Fleming named Joannes  
Corvus, Bishop Oldham, Lord Stowell, Lord Tenterden, Bishop  
Copleston, Henry Phillpotts, Bishop of Exeter, Dr. Buckland  
and others.



The chapel on the south side was completed in 1517 and has been subjected to many alterations from time to time. The screen of cedar wood was put up in 1677 and the panelled ceiling renovated in 1843. Over the altar is an original painting by Rubens, representing "The Adoration," from the collection of the Prince de Condé at Chantilly. The eagle lectern was given by John Claymond, the first president (1516-34); a very perfect brass to his memory is in the antechapel. The college possesses Bishop Foxe's crozier in silver gilt, a beautiful specimen of early sixteenth-century work, a golden chalice and paten given by the founder dated 1507, and other valuable sacramental and other plate, rings, &c.

The library is to the west of the chapel and contains an exceedingly good collection of early MSS., printed books, political tracts dating from the fifteenth century, one of the original volumes given to the Bodleian Library by Duke Humphrey, a complete set of Aldine classics used by the founder and other works. The original sockets for the iron rods, to which the chained books were attached, are still fixed to the shelves. The doors at either end are good examples of Tudor carving, and the stone mouldings on the walls deserve attention. At the east end is a gallery overlooking the chapel, formerly used as the President's private pew, and at the west end is the muniment-room.

South of the chapel is a small cloistered court that serves as a last resting-place for many old members of the college.

The Fellows' buildings, with the common room erected by Thomas Turner (president 1687-1714) at his own cost from designs by Dean Aldrich, are approached from the cloisters. Beyond are the Fellows' gardens, formed on the ramparts of the old city walls and overlooking Christ Church Meadows.

The President's lodgings date from 1591-1601, and on the visit of the allied sovereigns to the university in 1814 they were occupied by the King of Prussia. Originally the President used the rooms over the entrance gateway, one of which has a fine Tudor ceiling.

Additional buildings were erected at the corner of Merton Street and Grove Street in 1884, in the Jacobean style from designs by T. G. Jackson, R.A.

Among leading men who have been members of Corpus Christi College may be mentioned Bishop Jewell (author of "Apologia"), Richard Hooker (the judicious), Cardinal Pole, the last Catholic Archbishop of Canterbury (Fellow 1523), William Scott, Lord Stowell, Lord Tenterden (student 1781), Edward Copleston, Henry Phillpotts (Bishop of Exeter), Nicholas Udall (headmaster of Eton), General Oglethorpe (founder of the State of Georgia), Dean Buckland, Thomas Arnold (headmaster of Rugby) and John Keble, who entered as a scholar in 1808, when in his fifteenth year, and on taking a double first in 1811 accepted a Fellowship at Oriel.

#### *University Examination Schools.*

The New University Examination Schools were erected in 1877-82 upon the site of the old Angel Hotel, from designs by Mr. T. G. Jackson, R.A., at a cost of about 100,000*l.* The building forms a quadrangle, of which three sides are at present completed. The large entrance hall in the High Street is panelled in oak, with carved oak ceiling and tie-beam roof, the principal examination rooms being treated in a similar manner. The vestibules are supported by columns of rare marbles, the shafts of two in the south-west of the building being solid blocks of the famous Cippolini marble, for which the old quarry was specially opened. Other fine specimens of valuable marbles are seen in the balustrades and panels of the corridors and staircases. There are nine *viva voce* rooms on the ground floor, the writing-rooms being all on the floor above.

Adjoining the Schools, on the east side, is a building erected by Mr. Jackson in 1887 for the delegates of unattached or non-collegiate students of the University.

In conclusion I have to express my indebtedness for the valuable information I have obtained from the following works:—"The Colleges of Oxford," Andrew Clark, M.A.; "Merton College," B. W. Henderson, M.A.; "University College," William Carr, M.A.; "Oriel College," D. W. Rannie, M.A.; "The Early History of Oxford," James Parker; "Oxford and its Colleges," J. Wells, M.A.; "The Life of Walter de Merton," Edmund Bishop of Nelson, and the very excellent Oxford guide-books published by James Parker & Co., Alden & Co. and A. T. Shrimpton & Sons. Finally, I desire to record the best thanks of myself and other members of the Society to the Master of University, the Provost of Queen's, the Provost of Oriel, the Warden of Merton and the President of Corpus Christi for facilities given to see over their colleges and inspect the treasures therein, and especially to Mr. A. B. Poynton, M.A., bursar of University, for so kindly meeting the members and personally conducting them over his college.

#### THE ARCHITECTURE OF JAMAICA.\*

OF the dwellings of the aboriginal inhabitants of Jamaica no traces remain to-day. Indeed, no traces remain when Penn and Venables took the island. This is not to be wondered at, for we know that the quiet, inoffensive Arawaks were in no sense of the word builders. Unlike the Toltecs and Aztecs of the mainland, they were content with the humblest of dwellings, such as may be seen in the wilder parts of Guiana to-day, where of the forest houses those of the Arawaks are far the cleanest and best cared for. But while, except in the savannahs (a rare position for an Arawak dwelling) where the form is either round or oval, made so as to offer, it is thought, as little resistance to the wind as possible, the native dwellings in Guiana are usually rectangular, we may, perhaps, assume that those of the inhabitants of Jamaica when Columbus discovered it were circular in shape, for the "Historie" of Fernando Colombo, his son, in describing Guadeloupe on his first discovery, says:—"Their houses, instead of the ordinary round forms which had been hitherto met with in the West Indies, were square."

The natives of Guiana used the following plants which supplied materials for their houses—trollie palm, dwarf palmetto, cokerite or turu palm and oéta palm. None of these plants are, however, native of Jamaica, but the following probably to their place:—Thatch palm, bullthatch, palmetto thatch, silvethatch, wild plantain and aroid. The leaves of all these could be used for thatch for roofs or walls, and the stems of the palms would supply posts and beams. The houses were probably provided with substantial walls of wattled mud, plastered with mud, and the conical roof of palm leaves was high pitched. When on hunting expeditions they erected Guiana temporary huts called benabs.

Of the buildings erected by the Spaniards no remains which can be identified with any certainty exist. In various parts of the country one comes across so-called Spanish bridges and Spanish wells, and in some of them there may be examples of Spanish masonry.

The principal towns erected by the Spaniards were Meha, the first town founded by them, near Port Maria; Sevilla Nueva, founded by Juan de Esquivel in the early days of the sixteenth century, near St. Ann's Bay; and St. Jago de Vega, the modern Spanish town. Of their buildings in general, Sir Hans Sloane, who was here in 1687-88, only thirty-two years after the conquest, says that they were "usually one storey high, having a porch, parlour, and at each end a room, with small ones behind. They built with posts put deep into the ground; on the sides their houses were plastered up with mud or reeds, or made of the split trunks of cabbage trees nailed close to one another and covered with tiles or palmetto thatch. The lowness, as well as fixing the posts deep in the earth, was for fear their houses should be ruined by earthquakes, as still is the case for coolness." It seems strange, according to modern ideas, to build a house one storey only for coolness; although "a for-ever resident in the West Indies" has recently suggested that we should build our churches and markets underground.

Long tells us that "a certain number of posts of the hardest timber, generally lignum vitæ, brazilletto, or fustick, of about 18 feet in length and 6 to 8 inches in diameter, being first well-seasoned and hardened in smoke, were fixed at proper distances to the depth of 2 or 3 feet in the ground; then a wall of bark, enclosing these posts, was carried up with very strong mortar to the plate, which was pinned with wooden spikes to the tops of the posts. The main rafters were small, but being of the like hard wood, and perfectly well-seasoned, were sufficiently strong; these were likewise pinned upon each other, and at their angle of intersection at top formed a crutch to receive the ridge pole. The smaller rafters were of the lesser empty trees, stripped of their bark, hardened in smoke, notched at bottom, and being placed at the distance of about 18 inches from each other, were pinned to the plate. Athwart the whole all rafters a stratum of the wild cane (*Arundo Indica*, bamboo species), previously smoked, was tied on by way of wattling with straps made of the bark of mahoe or mangrove trees. Upon these wattles some mortar was laid, to the thickness of about 4 inches; and the whole covered with large pantiles, well bedded in. The thickness of these roofs, from the outward shell or tile-covering to the ceiling within, was about 8 or 10 inches. A canopy of so solid a texture was certainly well contrived to shelter the inhabitants from the disagreeable effects of a vertical sun, and accordingly it is found by experience that the old Spanish houses are much cooler than our modern ones covered with shingles. After regretting the failure to establish a manufacture of tiles, and the importation of North American shingles, Long goes on to say:—"The chief error the Spaniards committed in their buildings was the placing their ground

\* A lecture by Mr. F. Cundall delivered in the hall of the Institute of Jamaica.



ers too low; these were nearly on a level with the surface of earth out of doors, or at most raised only a few inches higher." In his time there were upwards of fifty Spanish houses remaining in Spanish Town, "very little the worse for weather."

Sloane on his expedition to the north side visited Sevilla Nueva. He says:—"I observed the ruins of the town called Sevilla, among which a church built by Peter Martyr of Angiera, of a sort of freestone (to be had near this city) and bricks. A pavement was found two miles from this church; the city was so large it had a fortified castle, the walls of which were made of stones and bricks, 4 feet thick; it was and is a good port. . . . The town is now Captain Hemming's plantation. The church was not finished; it was 30 paces broad and 30 paces long. There were two rows of pillars within; over the place where the altar was to be were some carvings under the ends of the pillars. It was built out of a sort of stone between freestone and marble, taken out of a quarry about a mile up in the hills; the houses and foundations stand for several miles along. The road towards the country is rising. Captain Hemmings told me he sometimes found pavements under his canes, 3 feet thick, covered with earth, and several times wells, and sometimes mill-stones finely cut. There are the beginnings of a great city called a monastery, but I suppose the house was designed for the Governor. There were two coats-of-arms not set on a ducal one, and that of a count, I suppose belonging to Columbus's family, the proprietors of the island. There have been raised a tower, part brick and part hewn stone, as also several battlements on it, and other lower buildings not finished. At the church lie several arched stones, complete it, which had never been put up, but lay among the ruins. The rows of pillars within were for the most part plain. At the time of the Spaniards it was thought the Europeans had been cut off by the Indians, and so the church left unfinished. When the English took the island the ruins of this city were overgrown with wood that they were all turned black; nay, I saw mammees, or bastard mammees grow within the walls of the tower, so high that it must have been a very large gun could it have been fired from the top of it, and most part of the timber fell'd off the place, when it was planted, was 60 foot or more long. A great many wells are on this ground. . . . The west gate of the town was a very fine work, and stands very entire; it was 12 feet wide, and as high before the arch began. Over the door in the middle was our Saviour's head with a crown of thorns, and then two angels; on the right side a small round figure of a saint with a knife struck into his head; on the left a Virgin or Madonna, her arm tied in three places, Spanish fashion. Over the gate, under a coat of arms, this inscription:—"Peter Martir ab Angleria Italvs Civis Mediolanen. Prothonotarius Insulæ Abbas Senatus Indici Consiliarius Ligneam hanc primus a Fundamentis Extruxit." Which Long thus translates:—"Peter Martir, of Anghiera, an Italian citizen of Milan, chief missionary and abbot of this island, member of the council of the Indies, first raised from its foundation, with this square stone, this edifice, which formerly was built of wood, and twice destroyed by fire."

This Peter Martyr must not be confounded with his namesake Pietro Martire Vermigli (1500-62), of Florence, who at the instance of the professor of theology at Oxford. Our Peter Martyr was Pietro Martire of Anghiera (1455-1526), a native of Arona, Italy, Apostolic Protonotary, and a member of the Council of the Indies to Charles V. and first abbot of Jamaica. He was the prototype of the absentee proprietor; he never set foot in the island. He is best known by his work entitled "De Orbe et Populo," commonly called "The Decades." The "some saint with a knife struck into his head," mentioned by Sloane, was the Dominican saint of the thirteenth century, well known to the artists of Mediaeval Christian art, especially by reason of the world-famous painting of his martyrdom, and the figures after whom the two sixteenth-century Peter Martyrs were named.

At the time that Long wrote (1774), nearly a century later than Sloane, several fragments of carved work in stone "that could be thought no mean ornaments in an European church" were still to be seen there, and the ruins of two edifices, one of which had been a castle and the other probably the collegiate church, were still remaining separated by about half a mile. The walls were compacted with a very hard cement, and were several feet in thickness. But he mentions that these walls were every day diminished for the sake of the materials, which were used in repairing the buildings on the estate, so that the remains of the castle were then below the surface of the earth. In 1764 he tells us there were dug up two columns of about 7 feet in length, "of no particular order, but somewhat resembling the Ionic," on which were "some carvings in relief." Four or five coarse images were likewise found, one of which resembled a sphinx, another an alligator, and the rest creatures of the mason's fancy.

Long says that the Spaniards abandoned Sevilla Nueva

because the south side ports were more convenient for the galleons and other vessels passing between St. Domingo and Carthage.

The foundations of St. Jago de la Vega were probably laid by the then Viceroy, Diego Columbus, about the year 1523. His son Lewis, created Duke of Veragua, had for a second title Marquis de la Vega, after this town. Hicqueringill (writing in 1661) tells us that when the English took the island it contained 2,000 houses, sixteen churches and chapels and one abbey, and that of these the English soldiery left but two churches and 500 houses undemolished, but it is thought by Long that this was an exaggeration.

Of the ecclesiastical buildings at St. Jago de la Vega trustworthy records exist only of an abbey, and a chapel of the red cross and a chapel of the white cross. The present cathedral stands on the site of the red cross chapel. The bases of two piers (he calls them columns) 8 feet square, part of the entrance to the abbey (which stood to the south of the present parade), were, in Long's time, standing near the south end of the public offices. They were of brickwork, strongly cemented. Long goes on to say:—"I have seen in this town a great many large stone mouldings for the bases and other parts of columns, which, as well as the sculptures dug out of the ruins of Sevilla Nueva, in St. Ann's, appeared to have been executed by no mean artists. The Spanish ecclesiastics . . . must be allowed some merit in having cultivated the elegances of architecture in these remote parts of the world. Some of their public structures at St. Domingo, the Havannah, La Vera Cruz, Carthage, Panama, &c., would make a noble figure even in European cities." Unfortunately it would seem that, judging from his comments on buildings still standing, art criticism was not one of Long's strong points.

The original English church at Spanish Town was destroyed by the hurricane of August 28, 1712. The present structure was rebuilt upon its old foundations in 1714. In 1762 it received thorough repair, and in 1817 the tower was raised. In 1901 it was restored in memory of Queen Victoria.

Hakewill (1821), one of the few artists who have ever seen the cathedral, calls it "an ancient brick structure of no exterior beauty." In Roby's time (1831) the walls were wainscotted, and the roof was coved and ornamented with circles, ovals and lozenges. The original residence of the governors consisted partly of the old Spanish edifice and partly of irregular additions made from time to time by Sir William Beeston and other governors. The Spanish hall of audience was demolished in 1761 to make way for the present building. Of it, Long says:—"Nothing of art or elegance graced the inside of this hall: it was lined throughout with boards, or rather planks, unequally hewn with an adze, none of them appearing to have undergone the embellishment of the plane; these were rudely nailed to upright posts, which supported the roof. The posts were for the most part crooked, not even squared, and many of them had some remnant of their bark, but they retained for the most part their primitive solidity. The whole of the woodwork, indeed, seemed to have passed through no other hands than those of a clumsy ship-carpenter." This description might almost apply to the dwellings of the native Arawaks. The plan of the present building was designed by Craskell, the engineer of the island, and the work was finished in 1762 during the governorship of William Henry Lyttelton.

The expense of building and furnishing amounted to nearly 30,000*l.* currency (or 21,428*l.* sterling), and in Long's time it was "thought to be the noblest and best edifice of the kind, either in North America or any of the British colonies in the West Indies." Monk Lewis, writing in 1834, says more truly:—"The Government House is a large, clumsy-looking brick building with a portico, the stucco of which has suffered by the weather, and it can advance no pretensions to architectural beauty." The façade is about 200 feet long; the free-stone used in the construction came from the Hope river course in St. Andrew. The columns of the portico are of Portland stone, the pavement of white marble, of which much came out, as ballast, from time to time in the old sugar ships, and is still seen in many a great house and town dwelling.

In 1672 Port Royal contained 800 well-built houses. Twenty years later, when it was at its zenith, the number was 2,000, "the greater number of which were of brick, several storeys in height." In 1692, as is well known, a large part of the town perished by an earthquake, and from that event Kingston dates its origin, Port Royal being partially destroyed again—by fire in 1703 and by hurricane in 1722.

Charles Leslie, writing in 1739, says of Jamaica:—"One is not to look for the beauties of architecture here; the public buildings are neat but not fine. The churches in the town are generally in form of a cross, with a small cupola a-top, built high in the walls, paved within, and adorned with no manner of finery." The churches, he says, except those at Spanish Town and Half-way Tree, are "decent small houses, scarce to be known for such," and he adds, "the clergy trouble them little, and their doors are seldom open," in marked contrast to the present state of affairs. "The gentlemen's houses," he



says, "are generally built low, of one storey, consisting of five or six handsome apartments, beautifully lined and floored with mahogany. . . . In the towns there are several houses which are two storeys, but that way of building is disapproved of because they seldom are known to stand the shock of an earthquake or the fury of a storm."

On Craskell & Simpson's large map of Surrey, of the year 1763, is shown a view of a presumably typical Jamaica house, two storeys high, with an open verandah in front only. It is evident from what Long says that, at all events for the first century of the island's occupation by the British, not much attention was paid to domestic architecture by the planters of the island. "It is," he says, "but of late that the planters have paid much attention to elegance in their habitations; their general rule was to build what they called a makeshift; so that it was not unusual to see a plantation adorned with a very expensive set of works, of brick or stone, well executed, and the owner residing in a miserable thatched hovel, hastily put together with wattles and plaster, damp, unwholesome and infested with every species of vermin. But the houses in general, as well in the country parts as the towns, have been greatly improved within these last twenty years."

In this connection mention may be made of the aqueducts on some of the sugar estates, which are amongst the best pieces of architectural work in the island. They and some of the old stone bridges compare more than favourably with the modern bridges, which—excellent monuments of engineering skill as they may be—their best friends would never venture to call many of them works of art. Moreover, the stone bridges will probably be standing when the iron ones have perished by decay.

Of planters' residences in Long's time, one of the finest is said to have been the Decoy, in St. Mary, the residence of Sir Charles Price, albeit it was built of wood. Peter Marsden, writing a little later (1788), says:—"Except a few excellent houses which have lately been built of brick and two or three of stone, after the English fashion, by rich merchants, the houses are in general of wood, very often mahogany, which is plentiful in this island. They consist but of a room or two below stairs, with piazzas all round and a storey above." Stewart, whose account of the island was published in 1808, gives much the same account of the domestic houses, but goes on to say:—"As for bridges and other public structures of the kind, in this part of the world there are few that deserve mention, except a neat cast-iron bridge imported from Great Britain, and some years ago thrown across the Rio Cobre. There is, indeed, often a marked deficiency here of public spirit in undertakings of this sort." Hakewill, writing in 1821, said, "The handsomest building in Kingston is the Scotch church in Duke Street, which was erected about the year 1814 by a public subscription from a plan of Mr. James Delancy," which does not say much for the rest of the buildings then existing.

I should like here to put on record my protest against the placing of the bust of the late Mr. Radcliffe in the inappropriate position which it occupies—blocking as it does the main entrance to the church, and giving an undue prominence to a man however good that man was. It was placed there in direct opposition to the expressed opinion of the sculptor, and I am sure that Mr Radcliffe would have been the first to condemn such a position for the bust or statue of any man.

Of Montego Bay Hakewill says:—"The church of this town is the handsomest in the island." Handsome is an adjective which hardly applies to this building, which exhibits a strange mixture of Classic and Gothic with an incongruous portico-like addition on the south side. But its tower is better than those of Spanish Town and Kingston.

One of the finest residences at one time must have been Colbeck, near Old Harbour; it is not mentioned by Long, or, in fact, by any other writer so far as I remember. Many of the houses on the sea coast were, in the eighteenth century, made defensible with loopholes, so as to guard against the attacks in war time of the enemy's privateers. Sir James de Castillo's house near Bull Bay was fortified by guns.

About the middle of the eighteenth century several of the finest houses in Kingston were built. Tradition says that three or four merchants of great wealth and equally great ambition as regards appearances made a heavy bet amongst themselves as to who should build the most magnificent residence. The result was, it is said, "Harmony Hall," the building to the north of the old Mico buildings (now the residence of Mr. Peet); "Jasper Hall," built by Jasper Hall, receiver-general and speaker of the House of Assembly (who called it "Constantine House"), which is dated 1st June, 1756; and "Head-quarter House," built by Thomas Hibbert (who came to Jamaica in 1734, and soon became one of the wealthiest merchants in Kingston), and formerly known as "Hibbert's House." Mr. Schiller's house, just north of Halfway Tree, is dated September 3, 1767.

The town of Kingston was laid out by Colonel Christian Lilly at the earliest in 1695, and not as Long and other historians say in 1693, for the simple reason that Lilly did not

reach Jamaica till 1695. The land was purchased from the Governor, Sir William Beeston, whose name still survives in Beeston Street. In his plan Lilly adopted the chess-board fashion of all Spanish cities in the New World—a plan which is at least as old as the Romans. If one omits the lanes, the plan of Kingston as laid down by Lilly in the seventeenth century is precisely the same as that of the recently unearthed Roman city of Calleva (Silchester) of thirteen centuries earlier, with its *insula* prototypes of the American blocks. Kingston consisted then of a parallelogram, one mile in length from north to south, and half a mile in breadth, regularly traversed by streets and lanes, alternately crossing each other at right angles. When Long wrote it contained "sixteen hundred and fifty-five houses, besides negro houses and warehouses; so that the whole number of its buildings, including every sort, may be computed at between two and three thousand, and thirty-five spacious streets and sixteen lanes." At present there are in Kingston 171 streets and sixty-nine lanes and about 9,000 houses.

Unfortunately Lilly when he planned Kingston, when land was cheap, omitted to leave room for lines of trees down each principal street. Had this been done, shade would have been afforded to drivers and pedestrians alike and a picturesque feature would have been assured for the town. Moreover, the chessboard plan of laying-out a town, naturally from its regularity dear to the heart of an engineer, is fatal in the interests of picturesqueness, however suitable it may be for progression.

The most serious mishap to the planning of the town has been the failure of succeeding generations to safeguard their interest in a sea front. A drive along the sea front, as was recently pointed out, would be a great improvement, and of the principle that half a loaf is better than no bread, a drive along the harbour edge past the Asylum would, though it would fail to improve the appearance of the town, yet prove a boon to the inhabitants. Had the main axis of the town been laid in a line with the sea breeze every house would probably have had a better share than many now have.

The arcades, which occurred to some sensible individual as a protection from the sun, have been carried out without an idea of proportion, of uniformity or of artistic appearance. Every man in Harbour Street seems to have been determined to have a different level from his neighbour. The pillars used are in some instances painfully suggestive of the four-post beds of our grand-parents. The Romans, it is true, took liberties with the Greek columns and put them on pedestals; make them higher, but they paid some little heed to proportion. The brick arcade at the north-east corner of the intersection of King Street and Harbour Street has at least the merit of being an honest piece of well-proportioned plain masonry.

Arcades or colonnades, which formed a prominent feature in the picturesque appearance of Mediaeval towns, and which still exist in England, notably at Chester, and in many a town in northern Italy, as at Bologna (which is called therefrom the City of Columns), are most suitable to tropical life. Well-proportioned arcades, with a uniform pavement along King Street and Harbour Street, would prove a boon to foot-passengers, a pleasing object to the eye and an advantage to the storekeeper. But in the last few years as much has been done in that direction as funds would allow. But nobody—not even a Baron Haussmann—could make Kingston picturesque or imposing while her main thoroughfares are disfigured by overhead wires and supporting poles.

In picturesqueness Port Antonio is far ahead of Kingston, partly by reason of natural conditions and partly by reason of the greater taste displayed in some of the buildings.

## IMPROVEMENT OF TOWNS.

THE Section of Engineering and Architecture of the Public Health Congress was opened by Mr. E. G. Mawley, C.E., Leicester, who, in the course of his presidential address, said the section devoted to engineering and architecture emphasized the importance of pure air and water, a dry and clean subsoil, diminution of noise from traffic in our streets, exercise and personal cleanliness, with healthy and cheerful homes and surroundings and plenty of honest and well-directed work. In order to obtain pure air there should be adequate public and private scavenging and cremation of refuse, efficient ventilation, wide thoroughfares, cleansing and ventilation of sewers and drains, and other sanitary arrangements. Open spaces in centres of population, ample air space in dwellings and around our factories and workshops. Light and air would be insured by the prevention and abatement of smoke, due restrictions upon noxious trades, electrification of our poisonous underground railways, the drainage and prevention of the pollution of subsoils, and the diminution of malarial and other troubles by the reclamation of swamp and improved drainage. Supplies of pure water were insured



the satisfactory disposal and efficient purification of the sewage of every town, village and habitation, by the prevention of polluting of rivers, water-courses and springs, and by the compulsory provision of a practically pure public water-supply, not only to large towns, but also throughout all rural districts, where large populations were now depending for their supply upon shallow and frequently highly polluted wells in close proximity to the dwellings. There was great need for a national movement, in conjunction with the Local Government Board, for a better control and utilisation of our catchment and drainage areas, so as to facilitate and even enforce the joint schemes, by groups of municipalities and local authorities, for the supply of wholesome water within the various watersheds of the country. In order to encourage exercise and personal cleanliness, ample provision of recreation grounds, gymnasia, baths and open-air bathing stations, &c., were indispensable in all thickly-populated districts. It was notable that the architects of the present day were making an earnest study of hygiene. The duties of sanitary and building inspectors were of vital importance, not only in discovering insanitary conditions and defects in construction, but in dealing with the neglect, misuse and mismanagement of even the best sanitary works which could be provided. There was perhaps no more difficult problem to be solved than the successful purification of sewage, and certainly nothing had given so much hope of a satisfactory solution of the difficulty as the recent experiments which had been conducted on bacteriological lines.

## TESSERÆ.

### Colouring in Painting.

WE must not believe that the employment of many colours in a composition is indispensable to give the epithet of colourist to the artist, for in painting in camaïeu, or monochrome, the simplest of all, in which we only distinguish two colours including white, the artist may be honoured with the title of colourist if his work presents lights and shades distributed as they are upon the model. To convince ourselves of the justice of the expression, it will suffice to remark that a model might very well appear to the painter coloured with single colour, modified by light and shade. In the same sense this epithet may be applied to the engraver, who, by means of his burin, reproduces a picture as faithfully as possible, in respect both to the aerial perspective of its different planes and to the relief of each particular object. A painter who has faithfully reproduced the aerial perspective, with all its modifications of white and coloured light and of shades, has effected a true or absolute colouring, which, however, may not be universally deemed as perfect as that in which this quality of absolute colouring is not found, at least in the same degree of perfection. A painter may have perfectly seized upon all the modifications of white and coloured light, but in his imitation of modifications or a part of them are more strongly marked than in nature. It almost always happens that true but exaggerated colouring is more agreeable than absolute colouring, and that many persons who experience pleasure in seeing the modifications of exaggerated coloured light which a picture may exhibit do not feel the same pleasure from the sight of a model, because the modifications corresponding to those which are imitated in excess are not sufficiently prominent to be evident to them. Besides, the relish of the eye for an excess of an exciting cause is essentially analogous to the inclination to have for food and drink of a flavour and odour more or less pungent. A painter may have perfectly seized all the modifications of light which bring forward the planes and the relief of objects; the modifications of the coloured light of his picture may be true, but the colours may not be those of his model. In pictures there is a dominant colour not found in the model, which is often called the tone of such a picture and the tone of such a painter, if he uses it habitually. We may form a very just idea of these pictures by supposing the artist to have painted them while looking at his model through a glass of precisely the colour to enable him to see the tint which predominates in his imitation. We may mention as an example of this kind of imitation a landscape painted from its reflection in a black mirror, the effect of which is very soft and harmonious. Thus we speak of brilliant or warm, cold or dull colouring.

### Flemish Settlements in England and Ireland.

It is a popular opinion that in the baronies of Forth and Bargie, co. Wexford, the Flemish element is exhibited in a very high degree. The origin of the colony presents no difficulty. Writers upon Irish history, local and general, agree in considering it as a settlement of the first adventurers, who in 1169 accompanied the expedition of Strongbow, Fitzstephen and Maurice Fitzgerald to Ireland, and to some among whom lands were assigned in the district now known under the name of the baronies of Forth and Bargie. This little band consisted

of one hundred and forty knights and three hundred infantry. The latter, being followers of Strongbow and Fitzstephen, may be presumed to have been recruited in Glamorganshire and Pembrokeshire, and one of the main foundations of the hypothesis of the Flemish character of the language of their descendants is derived from this circumstance. The population of these counties was at that time a very mixed one, consisting not only of Welsh, but also of English, of Normans, and of other foreign adventurers. Among these were a large number of Flemings who had been settled in Wales for nearly half a century previous to the invasion. A terrific inburst of the sea in 1107, and again in 1113, had laid waste the seaboard of the Low Countries, and had driven a considerable body of Flemings for refuge to England, with which country, since the marriage of Matilda, daughter of Baldwin of Flanders, with the Conqueror, a close connection had been maintained. With the English peasantry, however, these foreigners were from the first so unpopular that the king, Henry I., found it expedient to collect them all into one settlement around the present Haverfordwest, in Pembrokeshire, where they were joined by a subsequent immigration of their fellow-countrymen, who came over as military adventurers in the reign of Stephen in 1138. These Flemish settlements had their centre in the south of Pembrokeshire and the south-west of Glamorganshire, in that peninsula west of Swansea Bay still known as the Gower district, and that they engaged in considerable numbers in the invading expedition under Strongbow is inferred from the number of seemingly Flemish names which are still to be found in different parts of the county of Wexford, but especially in these baronies of Forth and Bargie. On a closer examination, it is true, this evidence will be found in part illusory. Of the names on which it is founded some are certainly of a date far later than the Anglo-Irish invasion. Others, however Flemish in appearance, are unquestionably Norman or English. Mr. Herbert Hore, of Pole Hore, however, in a learned paper in the "Archæologia Cambrensis," clearly proves the Flemish origin of many of the Wexford families. A roll of Wexford men, summoned for military service in 1345, cited by him, contains several unmistakably Flemish names. And on the whole it is impossible to doubt that the original settlement in the baronies of Forth and Bargie contained a considerable infusion of that Flemish element which already existed in the population of Pembrokeshire and Glamorganshire.

### Uniformity and Variety.

Uniformity and variety mean similarity and dissimilarity of form. Every one knows, however, that the mere union of similarity and dissimilarity does not constitute a beautiful form. In the forms of ground, of water, of vegetables, of ornaments, &c., it is difficult to find any instance of a perfectly simple form, or in which lines of different descriptions do not unite. It is obvious, however, that such objects are not beautiful in so great a proportion, and that, on the contrary, in all of them there are cases where this mixture is mere confusion, and in no respect considered as beautiful. If we inquire further what is the circumstance which distinguishes beautiful objects of these kinds, it will be found that it is some determinate character or expression which they have to us, and that when this expression is once perceived we immediately look for and expect some relation among the different parts to this general character. It is almost impossible, for instance, to find any form of ground which is not complex, or in which different forms do not unite. Amid a great extent of landscape, however, there are few spots in which we are sensible of any beauty in their original formation, and wherever such spots occur they are always distinguished by some prominent character—the character of greatness, wildness, gaiety, tranquillity or melancholy. As soon as this impression is made, as soon as we feel the expression of the scene, we immediately become sensible that the different forms which compose it are suited to this character; we perceive, and very often we imagine, a correspondence among these parts, and we say accordingly that there is a relation, an harmony among them, and that nature has been kind in combining different circumstances with so much propriety for the production of one effect. We amuse ourselves also in imagining improvements to the scene, either in throwing out some circumstances which do not correspond, or in introducing new ones, by which the general character may be more effectually supported. All this beauty of composition, however, would have been unheeded if the scene itself had not some determinate character, and all that we intend by these imaginary improvements, either in the preservation of greater uniformity or in the introduction of greater variety, is to establish a more perfect relation among the different parts to this peculiar character.

### The Cartoon of Pisa.

This work, whose celebrity subjected those who had not seen it to the supercilious contempt of the luckier ones who had, which was the common centre of attraction to all the students of Tuscany and Romagna, from Raphael Sanzio to Bastiano da San Gallo, called Aristotile, from his loquacious



descants on its beauties; this inestimable work itself is lost, and its destruction is with too much appearance of truth fixed on the mean villany of Baccio Bandinelli, who, in possession of the key to the apartment where it was kept, during the revolutionary troubles of the Florentine Republic, after making what use he thought proper of it is said to have torn it in pieces. Still we may form an idea of its principal groups from some ancient prints and drawings. Crude, disguised or feeble as these specimens are, they will prove better guides than the half-informed rhapsodies of Vasari, the meagre account of Ascanio Condivi, better than the mere anatomic verdict of Benvenuto Cellini, who denies that the powers afterwards exerted in the Cappella Sistina arrive at "half its excellence." It represents an imaginary moment relative to the war carried on by the Florentines against Pisa, and exhibits a numerous group of warriors, roused from their bathing in the Arno by the sudden signal of a trumpet, and rushing to arms. This composition may without exaggeration be said to personify with unexampled variety that motion which Agasias and Theon embodied in single figures; in imagining this transient moment from a state of relaxation to a state of energy, the ideas of motion, to use the bold figure of Dante, seem to have showered into the artist's mind. From the chief, nearly placed in the centre, who precedes, and whose voice accompanies the trumpet, every age of human agility, every attitude, every feature of alarm, haste, hurry, exertion, eagerness, burst into so many rays, like sparks flying from the hammer. Many have reached, some boldly step, some have leaped on the rocky shore; here two arms emerging from the water grapple with the rock, there two hands cry for help, and their companions bend over or rush on to assist them; often imitated, but inimitable, is the ardent feature of the grim veteran whose every sinew abours to force over the dripping limbs his clothes, whilst gnashing he pushes the foot through the rending garment. He is contrasted by the slender elegance of a half-averted youth, who, though eagerly buckling the armour to his thigh, methodises haste; another swings the high-raised hauberk on his shoulder, whilst one who seems a leader, mindless of dress, ready for combat and with brandished spear, overturns a third, who crouches to grasp a weapon—one naked himself buckles on the mail of his companion, and he, turned towards the enemy, seems to stamp impatiently the ground. Experience and rage, old vigour, young velocity, expanded or contracted, vie in exertions of energy. Yet in this scene of tumult one motive animates the whole, eagerness to engage with subordination to command; this preserves the dignity of action, and from a straggling rabble changes the figures to men whose legitimate contest interests our wishes.

#### Roman Architecture.

The architectural achievements of the Romans deserve the greatest admiration. The Greeks have the boast of having formed their temple from an idea so that everything was in keeping, but the Romans, although they did not invent new forms, had the wit to develop and combine existing forms so as to supply appropriately the demands of an imperial city, the capital of the world. They managed to solve the discord between columns and arches, and used them together. The taste of the Romans was not so delicate as that of the Greeks, who always managed to hit the happy mean between too much simplicity and over-elaboration; the Romans pile on all sorts of ornament to increase the effect, but they surpass the Greeks in their management of large spaces, for their buildings were practically unlimited in size and became models for imitation owing to the ingenuity of the grouping together of large and small rooms, so that each should be in the right place and serve its purpose, and yet be subordinate to the effect of the whole. A great architect and archæologist has said that the art of building in imperial Rome was the art of ruling the world expressed in stone.

#### GENERAL.

**The India Office** has just added to its collection of pictures associated with the Government of India a large portrait of Charles Lamb, who was a clerk in the East India Company's service, painted by Meyer, a nephew of Hoppner, in 1826, two years before the essayist retired on his pension. The picture belonged to his friend and biographer, Sir T. N. Talfourd.

**Colonel E. A. Yorke**, senior inspecting officer of railways, has been commissioned by the Board of Trade to proceed to America next month to report to the Board on the working of American railways, including both steam and electric lines.

**The Congress of the Sanitary Institute** will commence at Manchester on September 9. Delegates from about 350 sanitary authorities are expected to be present. Lord Egerton of Tatton will act as president. The usual Health Exhibition will be held in connection with the congress.

**M. Charles Duvent**, the painter, has been appointed delegate to represent French artists at the Hanoi Exhibition and promote their interests in the East.

**M. Nèige**, an Algerian architect, claims to have discovered a new colour, which may be termed "locust brown." It comes from the body of the locust, or, according to the *Presse*, from its "digestive tube." The new colour has some analogy with sepia, is non-putresced, and so naturally bright as to need no varnish. The colour given off by one insect, when mixed with water, will cover a space of 4 square inches.

**The Foundation-stone** of a Roman Catholic church, which is being erected in Bombay at a cost of 2½ lacs, was recently laid. A site has been secured near the Wodehouse Bridge on a lease of 198 years, and Mr. Chambers, of the firm of Gostlin & Morris, architects, has prepared the plans.

**The Royal Institute of Public Health Congress** held at Exeter have passed a resolution approving "of the efforts made by the Worshipful Company of Plumbers in promoting the Plumbers' Registration Bill, believing that such a measure will be for the safeguarding of the public health and beneficial to all classes of the community, and appeals to the Government to give facilities and support to the measure."

**The Japanese Authorities** strictly forbid the taking of photographs in and around Shimonooseki and Moji. The penalties for breaches of the regulations are very severe, and include imprisonment, fine and confiscation of the camera and plates. Special permission may sometimes be obtained from the gendarmerie office.

**Lady Algernon Gordon-Lennox** about two years ago started a wood-carving class to employ the villagers of Broughton and North Newington, near Banbury, on winter evenings. The members of the class did some carved work for the great hall of Broughton Castle, and Mr. Charles Dana Gibson, the American artist, was so much impressed with the beauty of the work that he has given the class an order to make the whole of the panelling for a new house which he is building in New York.

**Mr. George F. Sever**, adjunct professor of electrical engineering at Columbia University, has been appointed consulting electrical engineer to the Department of Water Supply, Gas and Electricity of New York City.

**The Dover Harbour Board** will in the course of a few weeks invite tenders in connection with the completion of the new commercial harbour, including the marine station and the additional accommodation required for transatlantic liners, involving an extra expenditure of 300,000*l*.

**Mr. Charles Poland**, who was formerly quantity-surveyor for the late G. E. Street, R.A., and other architects, died at Littlehampton on Saturday last in his seventy-fourth year. One of the last works on which he was engaged was the Palace of Justice in the Strand.

**An Exhibition** of ancient and modern metalwork has been opened in the Stuttgart Museum. Examples have been obtained from Munich, Berlin, Vienna and Paris. One of the most interesting sections is that of the Schlosser School in Rossau.

**Applications** were received by the Paris Municipality from no less than seventy-seven sculptors in the course of twenty-four hours for the commission to execute the busts of the Brothers Dutuit, who have presented their collection to the city. The two busts are to cost not more than 8,000 francs.

**Sir Frederick Bramwell** has been requested by the Portsmouth Council to inform them as to whether he will be able to advise "as to the most economical manner of remedying the flooding at Southsea."

**The Leipzig Town Council** have bought Max Klinger's nude statue of Beethoven, which incurred the disapprobation of the Kaiser.

**Mr. G. F. Bodley, R.A.**, has advised the committee appointed to promote the erection of a reredos in Ronceverte Cathedral that a carved stone reredos would be more popular than one of wood, as the latter would require much gilding and colour to make it effective. The architecture of the cathedral would not admit of a low reredos, and it would be undignified. He suggested that the altar be brought 6 feet (half a yard) westward.

**The Materials** of the premises on the west side of the National Gallery were sold by auction on Friday last, and the buildings are now in course of demolition in order to minimise the risk of danger to the Gallery.

**M. Dunant**, the curator of the Archæological Museum in Geneva, was killed last week while ascending Mount Pleier.

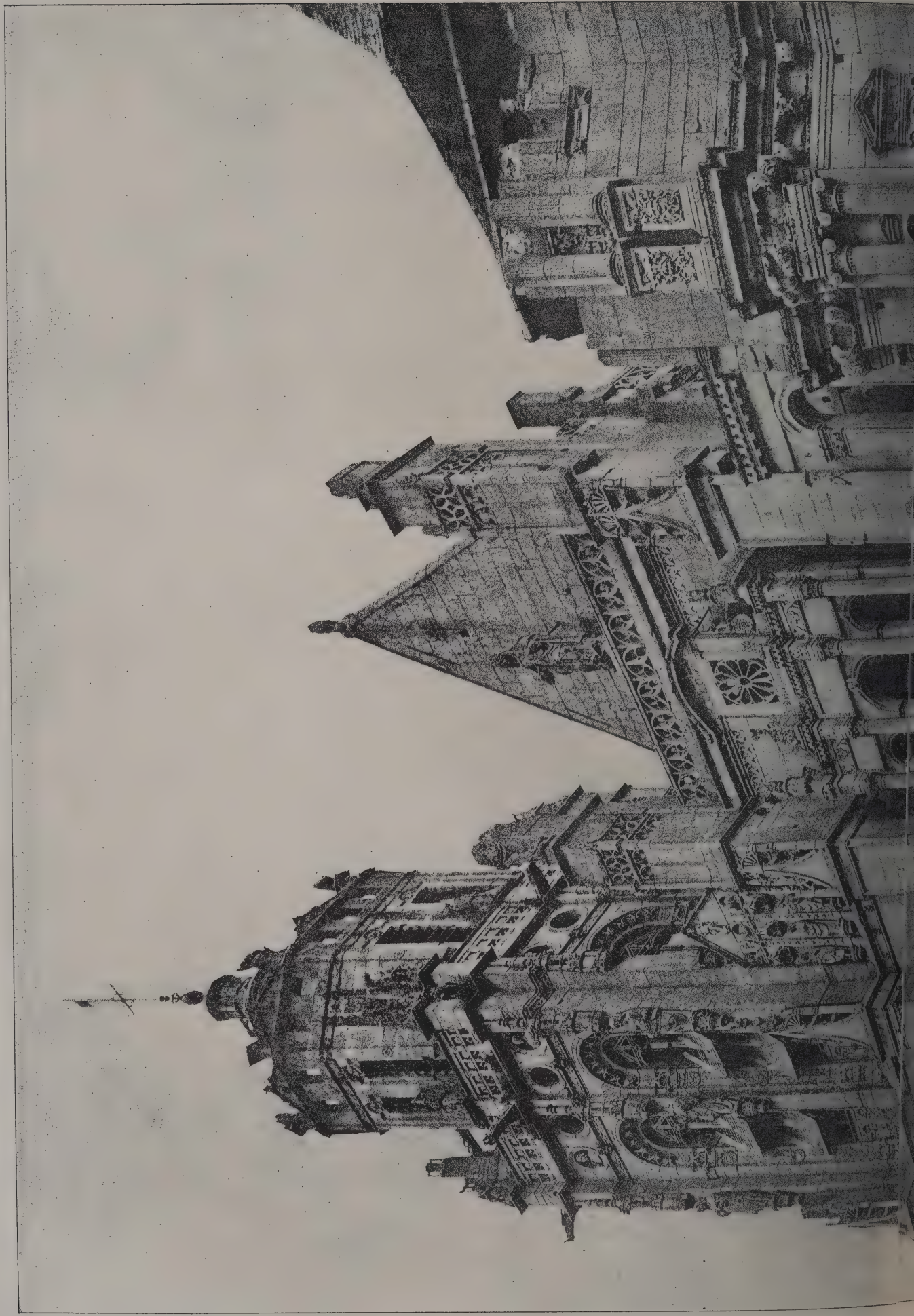
**Mr. C. Innes**, of 50 Cannon Street, London, E.C., architect for the new Board school about to be erected at Barnes.



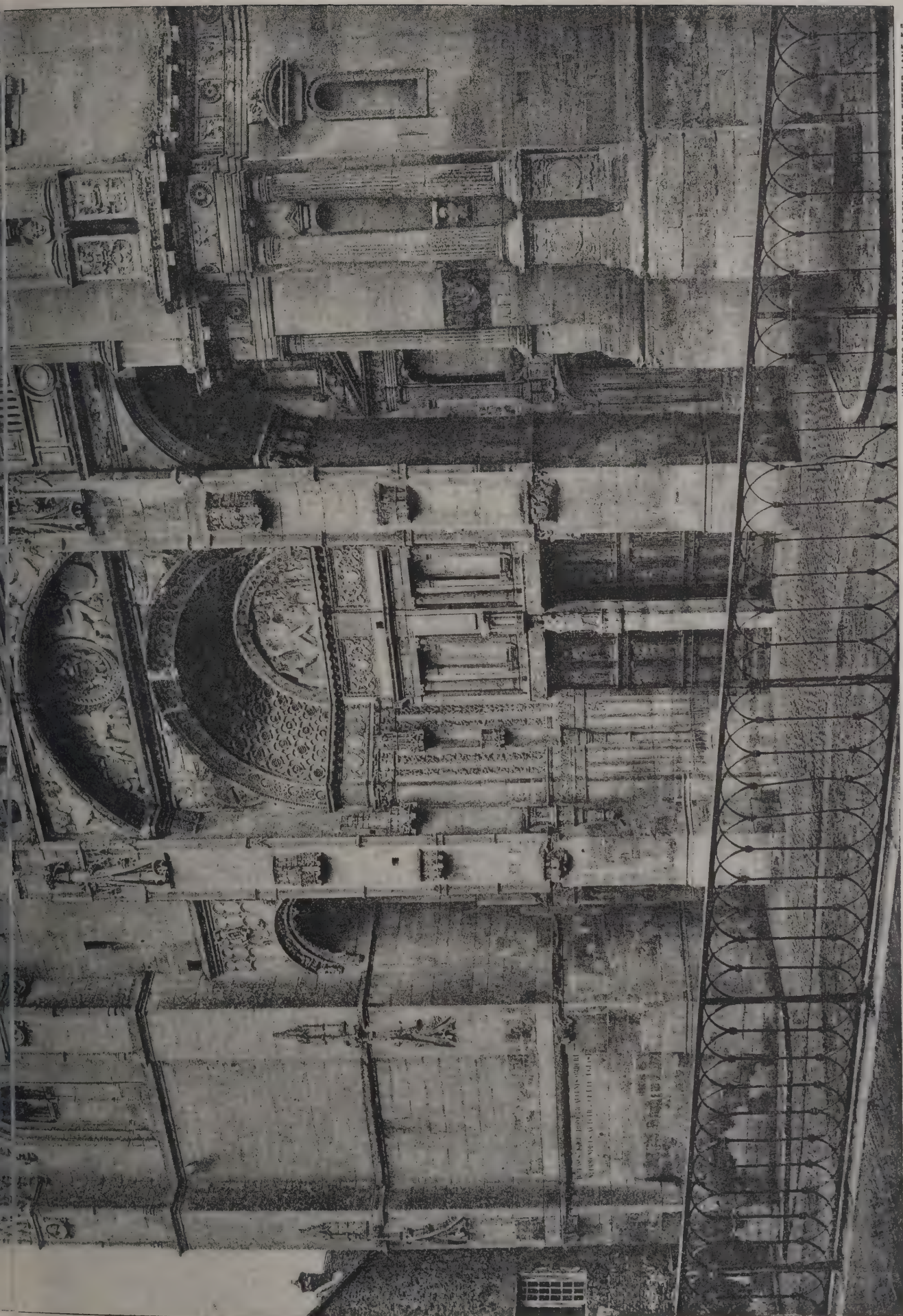
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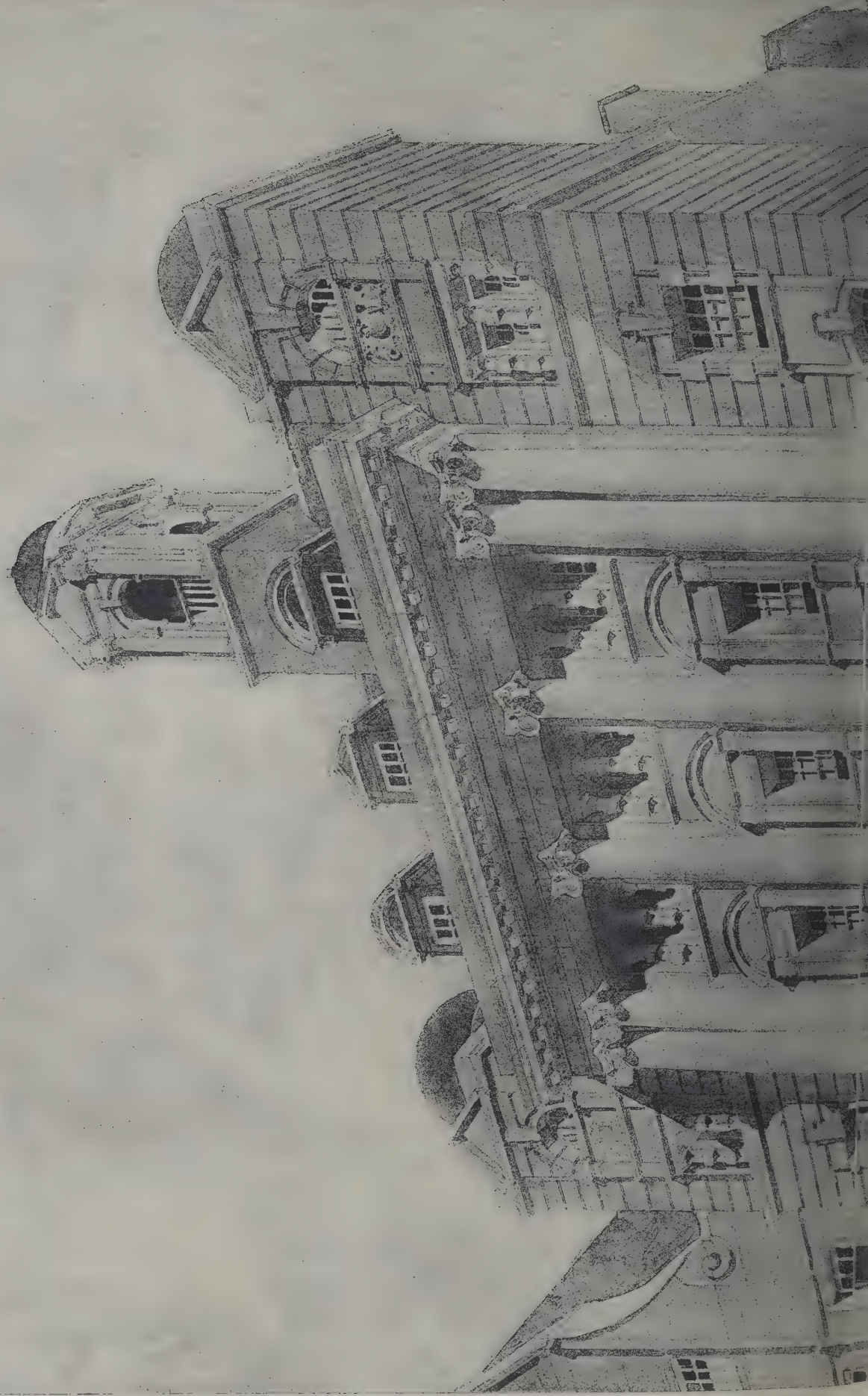




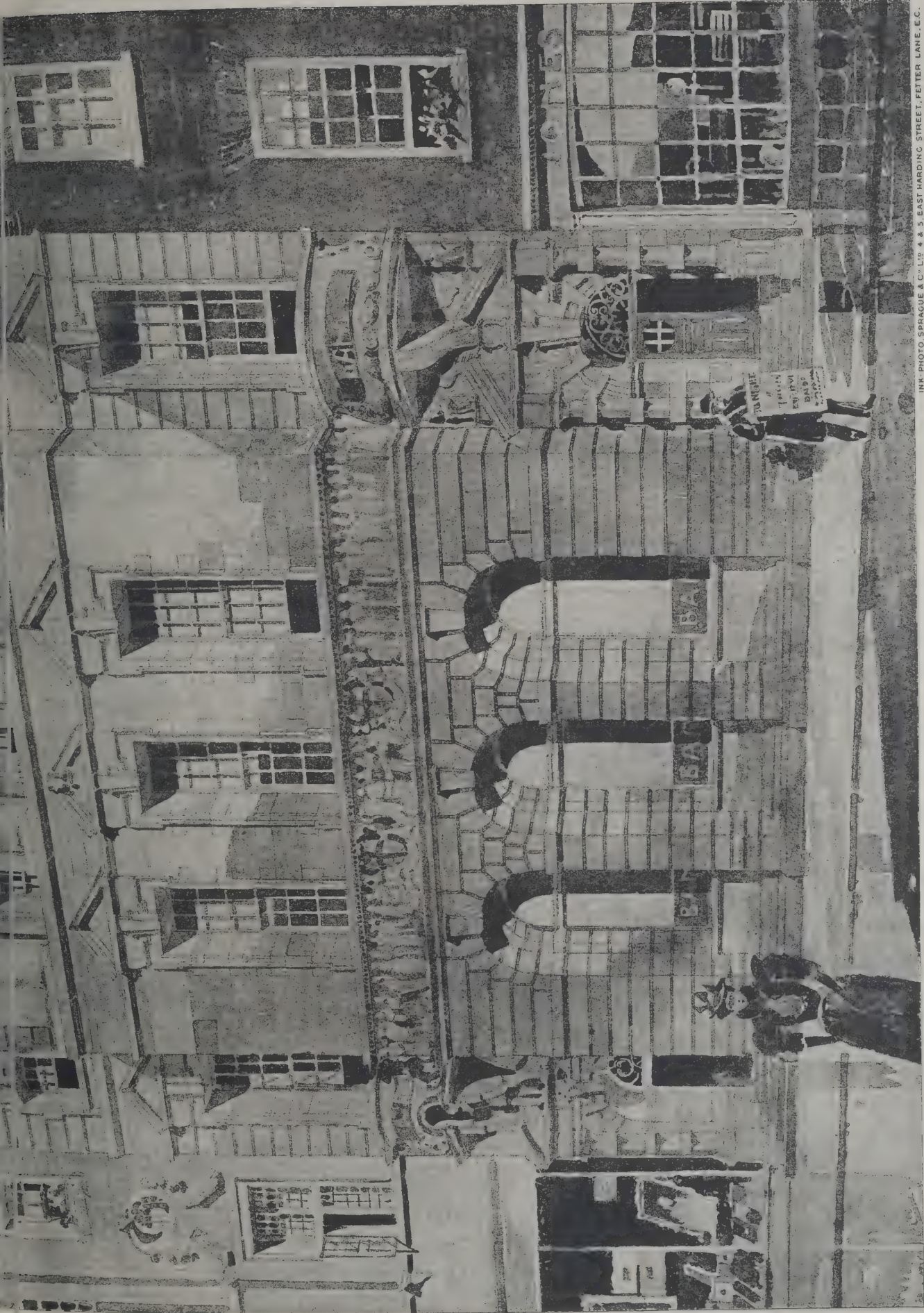
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DESIGN SUBMITTED FOR REBUILDING OF WESLEYAN CENTENARY HALL, BISHOPSGATE STREET, E.C.

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ROSENOR SQUARE, W.

Architect.



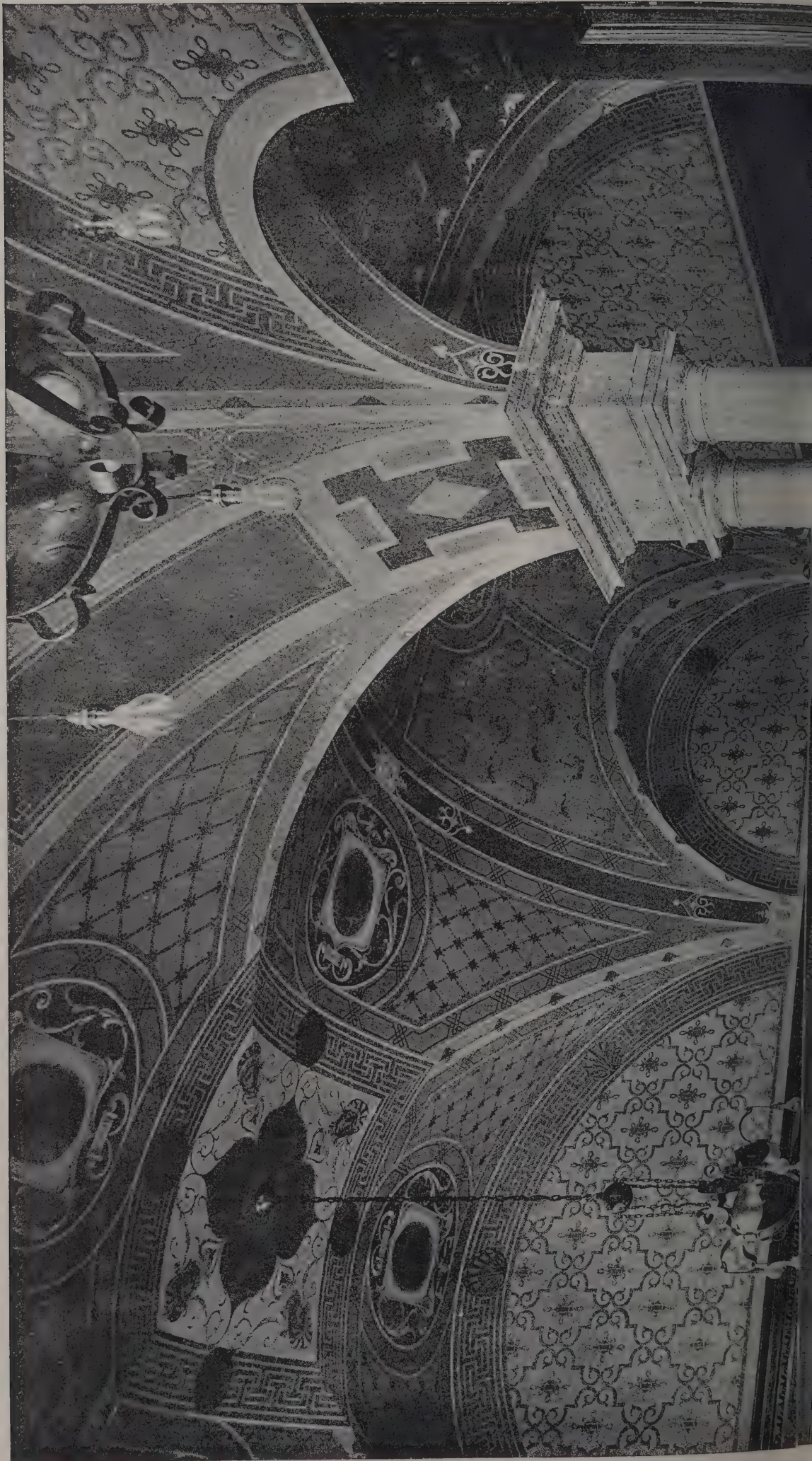




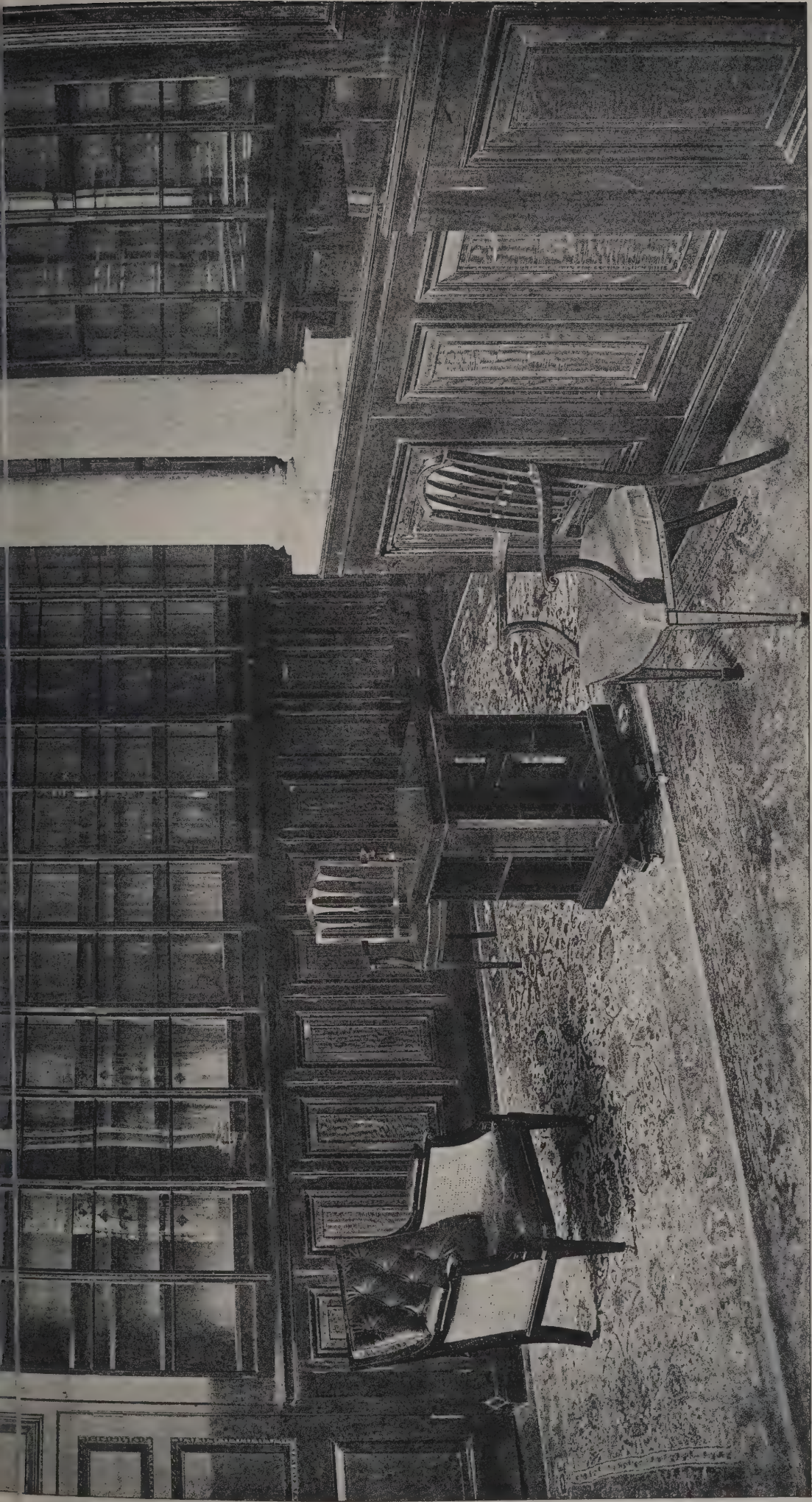
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THE

# Architect and Contract Reporter.

## EDITORIAL NOTICES.

*In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name, and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

## TENDERS, ETC.

*\*\* As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

## COMPETITIONS OPEN.

**BERMONDSEY.**—Sept. 16.—Designs are invited for artisans' dwellings to be erected on land at Rotherhithe, within the borough of Bermondsey, and known as the Fulford Street area. Premiums of 100l., 60l. and 40l. will be awarded. Mr. Fredk. Ryall, town clerk, Town Hall, Spa Road, S.E.

**BIDEFORD.**—Sept. 25.—The Town Council of Bideford are about to erect municipal offices and a public library upon a site opposite the west end of the Long Bridge, Bideford, and they invite designs for the proposed buildings. Premiums of 30l., 15l. and 10l. respectively are offered for the designs which shall be placed by the Council first, second and third in order of merit. Designs and descriptions, &c., are to be delivered to Mr. Wm. B. Seldon, town clerk, 18 The Quay, Bideford.

**INDIA.**—Nov. 1.—Competitive designs are invited for the erection of a memorial to Her Majesty the late Queen Victoria at Allahabad. A premium of 2,000 rupees will be awarded to the design selected by the committee. Mr. H. Nelson Wright, Indian Civil Service, honorary secretary, Queen Victoria Memorial Fund Committee, Allahabad, India.

**LIVERPOOL.**—Sept. 15.—Designs are invited for new labourers' dwellings to accommodate about 2,500 persons, to be erected on the Hornby Street area. Premiums of 250l., 150l. and 100l. respectively are offered for the first three selected designs. Particulars will be supplied by the Town Clerk.

**MAIDENHEAD.**—Oct. 1.—Designs for free library. Premiums offered of £50, £20 and £10 respectively. Mr. John Kirk, town clerk, Guildhall, Maidenhead.

**NEWARK.**—Oct. 14.—Designs and suggestions are invited for alterations and additions at the infirmary, Bowbridge Road, Newark, comprising a board and committee-room, a new mortuary and provision for twenty extra beds. A prize of twenty guineas is offered for the best plans sent to the office of Mr. M. H. Colton, clerk, 27 Lombard Street, Newark.

**SOUTHEND.**—Sept. 7.—Designs are invited for a church to accommodate 500 persons, a clergy-house, and a parochial hall or parish-room about 50 feet by 30 feet. Mr. C. H. J. Talmage, Kathleen Villa, Southchurch Road, Southend-on-Sea.

## CONTRACTS OPEN.

**ACTON.**—Oct. 7.—For erection of a refuse destructor. Mr. D. J. Ebbetts, surveyor, 242 High Street, Acton, W.

**BEETHAM.**—Sept. 8.—For erection of village schools, Beetham, Westmorland. Mr. John F. Curwen, architect, 26 Highgate, Kendal.

**BEXLEY HEATH.**—For erection of four cottages in May Place Road, Foresters' Asylum, Bexley Heath. Mr. W. F. Potter, architect, 18 York Grove, Queen's Road, Hatcham, S.E.

**BRADFORD.**—Sept. 2.—For erection of an engine-house, &c., at Northside Mills, Legrams Lane, Bradford. Mr. Jas. Ledingham, architect, District Bank Chambers, Bradford.

**BRADFORD.**—Sept. 6.—For extension of the Rawson Place markets. Mr. Frederick Stevens, town clerk, Town Hall, Bradford.

**BRADFORD.**—Sept. 6.—For erection of a Board school at Wyke, Bradford. Messrs. Adkin & Hill, architects, Prudential Buildings, Bradford.

**BRIGHTON.**—Sept. 2.—For alterations to the Corporation electricity works in Bread Street. Mr. Francis J. Tillstone, town clerk, Town Hall, Brighton.

**BRISTOL.**—Sept. 10.—For erection at Stapleton of an infirmary for the accommodation of about 875 sick patients. Mr. J. J. Simpson, clerk, St. Peter's Hospital, Bristol.

**CHESTERFIELD.**—Sept. 10.—For erection of an isolation hospital to accommodate thirty patients at Penmore, in the parish of Hasland, Chesterfield. Mr. G. E. Bolshaw, architect, 189 Lord Street, Southport.

**CROMER.**—Sept. 5.—For erection of a chapel with vestry, &c., caretaker's lodge, entrance gates and boundary wall at the new cemetery, Holt Road, Cromer. Mr. A. F. Scott, surveyor, West Street, Cromer.

**DARLINGTON.**—For erection of a Wesleyan church, &c. (with spire), Corporation Road, Darlington. Messrs. W. J. Morley & Son, architects, 269 Swan Arcade, Bradford.

**DOVER.**—Sept. 9.—For erection of Turkish baths adjoining the town hall, Dover. Sir Wollaston Knocker, town clerk, Castle Hill House, Dover.

**ENFIELD.**—Sept. 9.—For erection of a deaf centre and additions to the junior mixed and infant departments at the Bush Hill Park school, Enfield, Middlesex. Mr. G. E. T. Laurence, architect, 22 Buckingham Street, Adelphi, W.C.

**GATESHEAD.**—For rebuilding the Peareth Arms, High Street, Gateshead. Mr. L. H. Armour, 16 West Street, Gateshead.

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GREAT YARMOUTH.—Sept. 2.—For erection of a nurses' home at the workhouse. Mr. Arthur S. Hewitt, architect, Bank Chambers, Regent Street.

GWITHIAN.—Sept. 6.—For rebuilding the Pendarves Arms hotel, Gwithian, Cornwall. Mr. Horace W. Collins, architect, Walreddon, Redruth.

HACKNEY.—Sept. 11.—For erection of coal stores. Mr. George Grocott, town clerk, Town Hall, Hackney.

HADLEIGH.—Sept. 3.—For erection of school buildings, Hadleigh, Suffolk. Messrs. Eade & Johns, architects, Cornhill Chambers, Ipswich.

HENDON.—Sept. 15.—For erection of a pair of cottages at the sewage outfall works, Renters Lane; the erection of a corrugated iron fire-escape shed, Institute Road; and the supply and erection of entrance gates, boundary fencing, &c., at the Council offices. Mr. Henry Humphris, clerk, Urban District Council offices, The Burroughs, Hendon, N.W.

HUCKNALL HUTHWAITE.—Sept. 1.—For slating and plastering three shops in Main Street, Hucknall Huthwaite. Messrs. E. Turner & Sons, Hucknall Huthwaite.

ILKLEY.—Sept. 3.—For erection of the south abutment and wings of bridge over the river Wharfe at Ilkley. Mr. James B. Fraser, architect, 8 Park Square, Leeds.

IRELAND.—Sept. 1.—For alterations and extension to weaving factory, Belfast. Mr. James A. Hanna, architect, 102 Donegall Street, Belfast.

IRELAND.—Sept. 2.—For construction of a wall, laying a concrete floor and drainage works in connection with proposed public shelter at esplanade, Bangor, county Down. Mr. James Milliken, town clerk, Town Hall, Bangor.

IRELAND.—Sept. 3.—For erection of fourteen labourers' cottages (including out-offices, piers and gates) and the fencing of the acre plots attached thereto, and for the fencing of thirteen plots at Kinsale. Mr. John Murphy, clerk, Rural District Council board-room, Workhouse, Kinsale.

IRELAND.—Sept. 3.—For alterations at the male infirm lavatory and bathroom adjoining hospitals, Limerick. Mr. H. J. Guinane, clerk to the Guardians, Limerick.

IRELAND.—Sept. 6.—For deepening well and erecting a pump in the townland of Shantallow, Londonderry. Mr. W. L. Perry, clerk, R. D. C., Londonderry.

IRELAND.—Sept. 6.—For sinking and walling well and fixing pump at Kilbride, and erecting wall around the southern

end of Burgage burial-ground. Mr. D. J. Purcell, clerk, Board-room, Workhouse, Naas.

IRELAND.—Sept. 6.—For rebuilding a portion of the Pavilion, Armagh. Mr. H. C. Parkinson, architect, Armagh.

IRELAND.—Sept. 8.—For erection of an electric power station, 42 feet by 25 feet, in brick, with steel principals and slated roof, at the Grosvenor Street goods terminus, Belfast, for the Great Northern Railway Company (Ireland). Mr. T. Morrison, secretary, Amiens Street Terminus, Dublin.

LAMBETH.—Sept. 3.—For construction of conveniences at the junction of Stangate with Westminster Bridge Road, and at Loughborough Junction. Mr. Henry Edwards, borough engineer, Lambeth Town Hall, Kennington Green, S.E.

LANCASTER.—Sept. 1.—For taking-down and re-erecting on the new site the steamer shed at St George's Quay. Mr. T. Cann Hughes, town clerk, Town Hall, Lancaster.

LANCASTER.—Sept. 1.—For erection of a wall on St. George's Quay. Mr. T. Cann Hughes, town clerk, Town Hall, Lancaster.

LEEDS.—For erection of a warehouse in Whitehall Road, Leeds. Messrs. S. E. Smith & J. Tweedale, architects, 12 South Parade, Leeds.

LEEDS.—Sept. 5.—For erection of about 85 lineal yards of dwarf boundary wall at the Hill Top recreation ground, Armley. Particulars may be obtained at the City Engineer's Office, Leeds.

LEEDS.—Sept. 8.—For preparing the foundation of the Killingbeck hospital for smallpox, including formation of a new road. Mr. Edwin T. Hall, architect, 54 Bedford Square.

LEYLAND.—Sept. 16.—For erection of business premises on Chapel Brow, Leyland. The Leyland and Farington Co-operative Society, Ltd., Golden Hill, Leyland.

LEYTON.—Sept. 2.—For providing and erecting movable wood flooring and supporting trestles over the first-class swimming-bath at the public baths, Cathall Road, Leytonstone, E. Mr. William Dawson, surveyor, Town Hall, Leytonstone, Essex.

LEYTONSTONE.—Sept. 3.—For supply, delivery and erection of a washing-machine and four hydro-extractors at West Ham Union Workhouse. Mr. Fred. E. Hilleary, clerk Workhouse, Leytonstone.

LLANELLY.—Sept. 8.—For construction of a bridge over the river Lliedi, Llanelly. Mr. J. Vaughan Stewart, engineer, Harbour Office, Llanelly.

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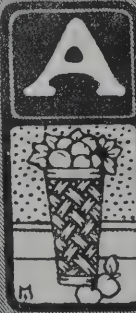
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MANCHESTER.—Sept. 5.—For erection of an electricity generating station adjoining Longford Bridge, Stretford. Mr. Ernest Woodhouse, architect, 88 Mosley Street, Manchester.

MARGATE.—Sept. 8.—For sinking of a well and working shafts, and driving about 3,200 yards of adit at Wingham, about a mile north of Adisham railway station. Mr. Edward Brooke, town clerk, 18 Cecil Square, Margate.

NEWCASTLE-UPON-TYNE.—For rebuilding the premises of the Co-operative Wholesale Society, Ltd, West Blandford Street. Mr. F. E. L. Harris, architect, Co-operative Wholesale Society, Ltd, 1 Balloon Street, Manchester.

NORTON-UNDER-CANNOCK.—Sept. 1.—For erection of Walsall Wood Board school, Norton-under-Cannock, Staffs. Mr. T. H. Fleeming, architect, Darlington Street, Wolverhampton.

NOTTINGHAM.—Sept. 1.—For erection of a refuse destructor and stables at the depôt, Wollaton Road, Radford. Mr. Arthur Brown, city engineer, Guildhall, Nottingham.

OTLEY.—Sept. 3.—For supply of a steam road-roller (an improved compound engine, with differential gearing, weight about 12½ tons). Mr. Chris. Jno. Newstead, clerk, Union Offices, Otley, Yorks.

PARKESTON.—Sept. 3.—For erection of schools for 510 children and alterations at Parkeston, Essex. Messrs. Start & Rowell, architects, Colchester.

PLYMOUTH.—Sept. 10.—For erection of a dry wall at Knighton, and laying pipes at Wembury Ford. Mr. Fred. Wm. Cleverton, clerk, Rural District Council, 4 Buckland Terrace, Plymouth.

ROCHDALE.—Sept. 4.—For supply and fixing of heating apparatus at Marland hospital. Mr. S. S. Platt, borough surveyor, Town Hall, Rochdale.

SALFORD.—Sept. 4.—For erection of a coal-shed roof at the Regent Road Gasworks. Mr. L. D. Evans, town clerk, Town Hall, Salford.

SOUTHWOLD.—Sept. 5.—For sub-piling part of the cliff protection works. Mr. Ernest R. Cooper, town clerk.

TRURO.—Sept. 8.—For erection of a rectory at St. Mary's Truro. Mr. G. H. Fellowes Prynne, architect, 6 Queen Anne's Gate, Westminster.

WALES.—Sept. 1.—For additions to The Ivies, Hereford Road, Abergavenny. Mr. B. J. Francis, architect, Abergavenny.

WALES.—Sept. 4.—For erection of a steel bridge complete to replace the present wooden structure over the river Bran at Pontwen Cynghordy, Llandovery. Mr. D. T. M. Jones, clerk, District Council Offices, Llandovery.

WALES.—Sept. 6.—For renovating Malakoff House, Brecon Road, Abergavenny. Mr. B. J. Francis, architect, Abergavenny.

WALES.—Sept. 7.—For erection of a temporary iron small-pox hospital, containing provision for eight beds, at Pontypridd. Mr. J. Colenso Jones, clerk, District Council Offices, Pontypridd.

WALES.—Sept. 8.—For erection of a cattle and sheep market at Llandovery. Mr. John Thomas, town clerk, Llandovery.

WALES.—Sept. 8.—For removal of St. George's pier, the construction of a sea-wall, promenade, &c., and construction and erection of a pier and floating landing stage. Mr. Thomas Hughes, clerk, Menai Bridge, Anglesey.

WALES.—Sept. 8.—For erection of a club building for the Briton Ferry Working-men's Club and Institute. Mr. H. Alex. Clarke, architect, Briton Ferry.

WALES.—Sept. 9.—For alterations to a building at Cardiff to adapt it for use as an electric-light station, for the Great Western Railway Company. Mr. G. K. Mills, secretary, Paddington Station, W.

WALES.—Sept. 15.—For erection of a new school, consisting of mixed and infants' departments, at Llwynycelyn, Porth. Mr. Jacob Rees, architect, Hillside Cottage, Pentre.

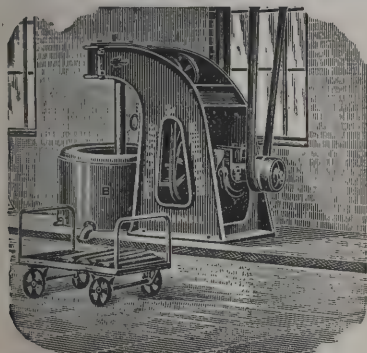
WALSALL.—Sept. 8.—For erection of a school to accommodate 1,000 children and a caretaker's house at North Walsall. Mr. H. E. Lavender, architect, Bridge Street, Walsall.

WESHAM.—Sept. 30.—For erection of workhouse and offices at Wesham, Lancs. Messrs. Haywood & Harrison, architects, Accrington.

WHITECHAPEL.—Sept. 22.—For erection of stores, cart and van sheds, lodge and public urinals at the depôt in Wentworth Street. Mr. G. W. Clarke, town clerk, 15 Great Alie Street, Whitechapel, E.

WOOLWICH.—Sept. 18.—For erection of municipal buildings at the corner of Wellington Street and Upper Market Street, Woolwich. Mr. A. Brumwell Thomas, architect, 5 Queen Anne's Gate, Westminster.

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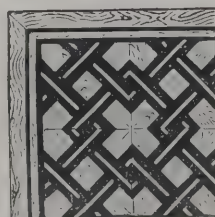
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Fenton . . . . .	1,852	0	0
Craig . . . . .	1,777	12	9
Wheeler . . . . .	1,696	0	0
Swaker . . . . .	1,690	4	0
RANDALL, Abingdon (accepted) . . . . .	1,598	7	10

**AMBLE.**

For street works in Woodbine Street. Mr. W. GIBSON, surveyor, 31 Queen Street, Amble.

E. COULSON (accepted) . . . . . £168 15 0

**ARMLEY.**

For erection of a small shed, a carpenter and smith's shops, &c., at Antwerp Mills, Armley, Leeds. Mr. C. S. NELSON, architect, Sun Buildings, 15 Park Row, Leeds.

E. WALES, 25 Wortley Road (accepted) . . . . . £556 12 8

**AYLESBURY.**

For sewerage works, with manholes, &c., in the parish of Bierton.

H. E. RICKARD, Bierton (accepted) . . . . . £105 0 0

**BIGGLESWADE.**

For erection of a Sunday school. Mr. THOS. COCKRILL, architect, Market Square, Biggleswade.

S. Redhouse, sen., Stotfold . . . . . £285 0 0

Stones & Skelton, Biggleswade . . . . . 247 0 0

Wright, Langford . . . . . 235 0 0

**BRIDGWATER.**

For sewerage works, with manholes, and construction of bacteria beds for sewage-disposal works at Westonzoiland, Bridgwater. Mr. W. A. COLLINS, engineer, 120 West Street, Bridgwater.

E. H. Page . . . . . £215 7 8

J. Palmer & Sons . . . . . 175 0 0

C. Bryer, jun. . . . . 163 1 3

R. ASHTON, Bridgwater (accepted) . . . . . 154 0 0

**BRADFORD.**

For erection of laundry, boiler-house, chimney and stabling in Barnard Terrace, Usher Street, Bradford. Mr. WM. RYCROFT, architect, Bank Buildings, Manchester Road, Bradford.

**Accepted tenders.****Laundry, &c.**

C. Booth & Sons, Lidget Green, mason, &c.

E. Fearnley & Sons, Trafalgar Street, joiner.

J. H. Clapham, Bowling Old Lane, plumber.

A. Taylor, Eccleshill, plasterer.

G. Wilkinson, Burnett Avenue, slater.

S. Cockroft, Allerton, painter.

Roberts & Co., Dudley Hill, ironfounder.

**Stabling.**

C. Booth & Son, mason.

Bradford District Joiners' Works Department, Adolphus Street, joiner.

J. H. Clapham, plumber.

A. Taylor, plasterer.

G. Wilkinson, slater.

S. Cockroft, painter.

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**BURY.**

For rebuilding the Robin Hood inn, Rochdale Road, Bury, Lancs. Mr. A. HOPKINSON, architect, 15 Agur Street, Bury.

C. BRIERLEY, Fishpool, Bury (accepted).

**CHRISTCHURCH.**

For erection of a house and store at the cottage homes, Fairmile, Christchurch, Hants.

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**EAST SHEEN.**

For laying-out and sewerage portion of Palewell Park estate, East Sheen. Mr. WILLIAM HUNT, surveyor, Donnington House, Norfolk Street, Strand.

Wimpey & Co. . . . . £1,800 0 0

C. Killingback . . . . . 1,756 0 0

W. H. Wheeler . . . . . 1,743 0 0

J. Jackson . . . . . 1,729 0 0

W. H. WOODHAM, Catford, S E. (accepted) . . . . . 1,665 0 0

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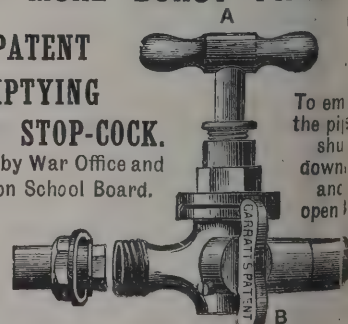
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J. Meston	3,124	0	0
S. Kavanagh & Co.	2,964	15	6
J. MAY, Ashstead, Surrey (accepted)	2,335	0	0

EWSHOT.

For altering the gradient of the road over Beacon Hill, Ewshot, Hants.

Mott	£850	0	0
T. Turner	589	0	0
J. J. Paddington	587	0	0
Mussellwhite	529	0	0
R. CUNNINGHAM, Fleet (accepted)	519	0	0

HALWELL.

For repairing and levelling road and constructing a new carriage drive, two entrances, piers and gates at Higher Washbourne, Halwell, near Totnes, Devon. Mr. R. MONTAGUE LUKE, engineer, 15 Princess Square, Plymouth.

Shillabear	£650	0	0
HARRIS & LEIGH, Harbertonford (accepted) *	241	5	0
W. E. Bennett	202	8	9

\* Without repairs to existing wall, £226 5s.

HARROGATE.

For erection of a gardener's cottage at the Heatherdene Con-valescent Home, Harrogate. Messrs. FRANCE, MILNES & FRANCE, architects, 99 Swan Arcade, Bradford.

Accepted tenders.

E. England, mason.	
M. Preston, joiner.	
J. Light, plumber.	
J. Tyson, plasterer.	
J. Shepherd, tiler.	
G. H. & F. S. Lawn, painter.	

HARROGATE—continued.

For alterations, additions and roof over town's yard at Robert Street. Mr. F. BAGSHAW, borough surveyor.

Accepted tenders.

W. Jackson & Son, mason	£1,530	0	0
J. Bagshaw & Sons, Limited, ironwork	606	15	0
G. H. Carrick, joiner	560	0	0
G. Thompson, plumber	439	0	0
T. Rayner, slater	131	11	6
M. M. Bartholomew, plasterer	44	7	4
W. Norman, painter	40	0	0

HELMSLEY.

For widening and strengthening Shaken bridge, near Helmsley, Yorks. Mr. W. G. BRYNING, surveyor, Northallerton.

W. BLACKBURN, Broughton, Malton (accepted).

HIGH HARRINGTON.

For erection of a six-roomed house at High Harrington, Cumberland. Messrs. W. G. SCOTT & CO., architects, Victoria Buildings, Workington.

Accepted tenders.

H. Killip, Harrington, mason	£142	0	0
T. McMullen, Harrington, joiner	61	16	0
J. Lawson, Workington, plasterer	48	0	0
J. B. Whitfield, Workington, slater	16	6	0
D. M. Walker, Workington, plumber	13	0	0
J. Pratt, Harrington, painter	8	0	0

HIPPERHOLME.

For widening the road and county bridge over the beck at Bailiffe Bridge, Hipperholme. Messrs. WALSH & NICHOLAS, surveyors, Museum Chambers, Halifax.

S. WILKINSON (accepted).

HULL.

For construction of a new street about 907 lineal feet in length on the north side of the Anlaby Road. Messrs. WELLSTED & EASTON, engineers, Prince's Dock Chambers, Hull.

T. C. Starkey	£1,966	13	0
B. Robinson	1,910	0	0
Boyce, Bradley & Co.	1,585	6	0
R. Fisher	1,569	0	11
A. H. Atkinson	1,561	0	0
J. SANGWIN, Hull (accepted)	1,520	0	0

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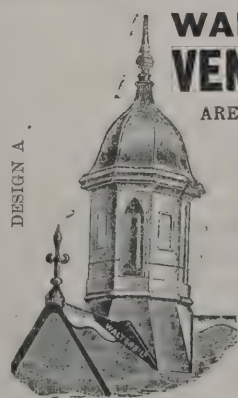
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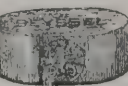
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W. SCOTT & SONS, Jarrow (*accepted*) . . . £133 17 6

For street works in Bede Burn Road and Wansbeck Street, and footpath in Cross Street and East Back Wansbeck Street. Mr. J. PETREE, borough surveyor.

G. Wells . . . . . £71 5 10

G. Thornton & Co. . . . . 66 10 9

GLEN & MOFFETT, Jarrow (*accepted*) . . . 59 1 0

**LANGLEY MOOR.**

For erection of St. Patrick's (Roman Catholic) schools at Langley Moor, Durham. Mr. H. T. GRADON, architect, 22 Market Place, Durham.

J. ROBSON, Waterhouses (*accepted*) . . . £1,690 0 0

**LEWES.**

For erection of Guardians' offices and Board-room. Mr. H. CURTIS CARD, architect, Lewes.

E. Hammond . . . . . £3,799 0 0

W. Wells . . . . . 3,060 0 0

PEERLESS, DENNIS & CO., Eastbourne (*accepted*) . . . 2,968 0 0

Noakes & Son . . . . . 2,893 0 0

**LONG EATON.**

For erection of engine-house and rope race, Harrington Mills, Long Eaton. Mr. JOHN SHELDON, architect, Darley House, Long Eaton. Quantities by the architect.

J. H. Williamson & Co. . . . . £826 0 0

F. Messom . . . . . 806 0 0

Youngman & Son . . . . . 795 0 0

Hutchinson & Son . . . . . 780 0 0

PERKS & SON, Long Eaton (*accepted*) . . . 770 0 0

**MARYBOROUGH.**

For construction of a wrought-iron gasholder with all necessary attachments, for the Maryborough Gas Company, Ltd.

*Gasholder.*

WILLEY & Co., St. Thomas, Exeter (*accepted*) . £272 0 0

*Purifiers.*

WILLEY & Co. (*accepted*) . . . . . 189 0 0

**MILLOM.**

For erection of bank premises, Millom. Mr. JOHN F. CURWEN, architect, 26 Highgate, Kendal.

*Whole tenders.*

D. Mackereth . . . . . £3,960 0 0

R. G. W. Bradley . . . . . 3,700 0 0

W. Richardson . . . . . 3,270 0 0

W. Tomlinson . . . . . 2,985 0 0

*Separate tenders.**Waller, mason and bricklayer.*

A. J. Blair . . . . . 2,095 0 0

W. Richardson . . . . . 1,722 10 6

R. Pennington, Kendal \* . . . . 1,705 10 0

W. Tomlinson . . . . . 1,600 0 0

*Slater.*

A. J. Blair . . . . . 136 0 0

W. Richardson . . . . . 73 16 0

T. Mandle . . . . . 70 10 0

W. Tomlinson . . . . . 70 0 0

W. J. Cross . . . . . 65 4 0

R. PENNINGTON, Millom (*accepted*) . . 64 10 0

*Plasterer.*

J. Perrin . . . . . 185 5 5

W. Richardson . . . . . 163 8 6

W. Tomlinson . . . . . 160 0 0

W. J. CROSS, Millom (*accepted*) . . . 149 12 0

*Carpenter and joiner.*

W. Richardson . . . . . 814 12 0

G. F. Martindale . . . . . 735 0 0

W. TOMLINSON, Millom (*accepted*) . . . 680 0 0

*Plumber, painter and glazier.*

W. Richardson . . . . . 496 5 6

*Plumber.*

W. Mandall . . . . . 294 3 0

W. Tomlinson . . . . . 275 0 0

J. M. Clark . . . . . 263 0 0

D. Burns . . . . . 250 0 0

J. MILLS & SON, Millom (*accepted*) . . 246 0 6

\* Accepted. The tender includes granite base and steps, supplied by the Shap Granite Co., Ltd.

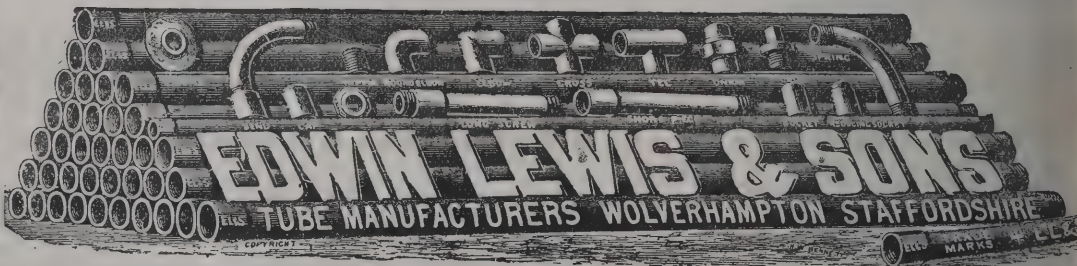
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W. Tomlinson . . . . .	200	0	0
J. MILLS & SON, Milloom (accepted) . . . . .	197	0	9
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For (1) painting the exterior of the workhouse, Delaunay's Road, Crumpsall; (2) painting and limewashing the interior of the workhouse; (3) painting the outside and limewashing the inside of the vagrant wards,  
A. BRADSHAW, Prestwich, Manchester (accepted) . . . . . £720 0 0

PURLEY.

For construction of roadway at Foxley estate, Purley (first portion). Mr. FRANK WINDSOR, architect and surveyor, 9 and 10 Bank Buildings, George Street, Croydon.  
Streeter Bros. . . . . £1,223 0 0  
W. Langridge . . . . . 929 0 0  
F. CHAPPELL, Purley (accepted) . . . . . 922 10 0

SCOTLAND.

For alterations and repairs at Mains of Glasclune, Blairgowrie. Mr. LAKE FALCONER, architect, Blairgowrie.

Accepted tenders.

W. T. Robertson, Blairgowrie, joiner . . . . .	£42	10	0
Webster & Anderson, Glenisla, mason . . . . .	16	14	2
R. Kidd, Blairgowrie, plumber . . . . .	7	10	0
H. Leith & Son, Blairgowrie, slater . . . . .	4	10	0

For erection of a double villa in Kirriemuir. Mr. LAKE FALCONER, architect, Blairgowrie.

Accepted tenders.

Mason.			
Watson & Son . . . . .	£336	0	0
Joiner.			
Davidson & Herald . . . . .	268	0	0
Plumber.			
A. Stewart & Son . . . . .	103	0	0
Slater.			
A. Stewart & Son . . . . .	52	8	6
Plasterer.			
J. Thoms . . . . .	33	6	0

SCOTLAND—continued.

For erection of shops in Kirriemuir. Mr. LAKE FALCONER, architect, Blairgowrie.

Accepted tenders.

Mason.			
J. Watson & Son . . . . .	£344	0	0
Joiner.			
J. Low . . . . .	263	0	0
Plumber.			
A. Stewart & Son . . . . .	65	14	0
Slater.			
T. Donaldson . . . . .	16	16	7
Plasterer.			
G. Munro . . . . .	33	9	6

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SHERBURN HILL.

For conversion of Shotton Colliery schools into branch stores. Mr. H. T. GRADON, architect, Durham.  
DRAPER & SONS, Leamside (accepted) . . . . . £900 0 0

STALYBRIDGE.

For erection of four new shops in Market Street, Stalybridge. Mr. EDWARD GARLICK, architect, 121 Stamford Street, Stalybridge.

W. Storrs, Sons & Co, Ltd. . . . .	£3,599	0	0
Myles & Warner . . . . .	3,596	19	7
A. Chorlton . . . . .	3,397	0	0
Wilson & Roberts . . . . .	3,362	0	0
Shuttleworth Bros. . . . .	3,300	0	0
E. Marshall . . . . .	3,298	0	0
Saxon Bros. & Co. . . . .	3,285	0	0
J. Ridyard . . . . .	3,280	0	0
GARSIDE, BARNES & CO., LTD., Stalybridge (accepted) . . . . .			
J. Robinson . . . . .	3,100	0	0
Burgess & Sons (plumbing only) . . . . .	400	0	0

TRURO.

For alterations to the city isolation hospital. Mr. MEASHAM LEA, city surveyor.  
H. TIPPETT (accepted) . . . . . £95 0 0

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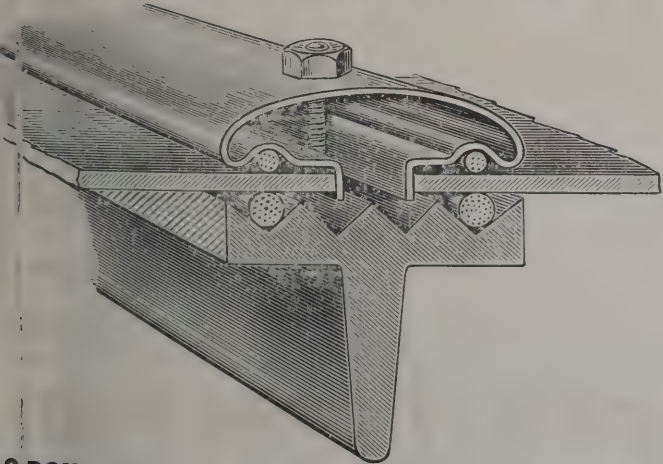
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## WALES.

- For water-supply works for Talybont village. Mr. B. L. PRITCHARD, surveyor, 8 Castle Street, Brecon.
- J. D. & W. FRYER, Brecon (*accepted*) . . . £460 0 0
- For alterations and additions to Minera police-station. Mr. R. LLOYD WILLIAMS, county surveyor, Denbigh.
- S. MOSS, Wrexham (*accepted*) . . . £183 4 0
- For erection of a stone arched bridge or an iron girder bridge at the Pitt, Llanarth, Abergavenny. Mr. JOHN GILL, architect, 4 Brecon Road, Abergavenny.
- E. SHURR, Abergavenny (*accepted*) . . . £69 0 0
- For alterations and additions to the waterworks, Bethesda.
- R. A. Lowe . . . £988 0 0
- W. Thomas . . . 968 0 0
- H. GRIFFITH, Lydgoed Aber (*accepted*) . . . 815 0 0

## WORKINGTON.

- For erection of four cottages in Harrington Road, Workington. Messrs. W. G. SCOTT & Co, architects, Victoria Buildings, Workington.

*Accepted tenders.*

- Miller & Edgar, mason . . . £445 5 0
- J. Fletcher, joiner . . . 194 0 0
- J. Perrin, plasterer . . . 100 0 0
- J. A. Pape, plumber . . . 79 10 0
- J. Lythgoe & Sons, slater . . . 51 10 8
- G. Davies, painter . . . 21 0 0

## YALDING.

- For reconstruction of Hampstead Lane bridge, Yalding, Kent. Mr. FREDERICK W. RUCK, surveyor, 86 Week Street, Maidstone.
- Tuff & Miskin . . . £4,732 3 0
- A. E. Nunn . . . 4,570 0 0
- Barden & Head . . . 4,547 0 0
- G. E. WALLIS & SONS, Maidstone (*accepted*) . . . 4,128 0 0

HER MAJESTY THE QUEEN has graciously been pleased to accept the dedication of Mr. H. Inigo Triggs's work on the "Formal Gardens of England and Scotland," the concluding part of which will be shortly issued to the subscribers by Mr. B. T. Batsford.

## ELECTRIC NOTES.

MR. R. H. BICKNELL, Local Government Board inspector attended at Cleckheaton town hall for the purpose of conducting an inquiry into the District Council's application for sanction to borrow 6,000*l.* for an extension of their electricity plant.

IN Canada extensive developments are being made in the use of natural water power in the production of electricity. About midway between Montreal and Quebec is the river St. Maurice, a tributary of the St. Lawrence. This stream brings down an enormous body of water, which tumbles over the Shawinigan Falls. Rapids and cascade together are capable of producing 200,000 horse-power. Works have been constructed to convert the fall into electric energy by means of suitable turbines, and generators of 30,000 horse-power will be at work sending power to Montreal and Quebec, eighty-four and ninety miles away respectively, and to Three Rivers and other places nearer at hand. At no distant day double this amount, or 60,000 horse-power, will be at the service of the community. This is one example only of the water-power utilisation which is in progress or in contemplation all over the Dominion. The turbines and electric machinery, or most of it, are being made in the States.

AN inquiry was held on the 21st inst. at Dewsbury into an application by the Corporation, on behalf of the gas and electricity committee, for permission to borrow 10,000*l.* for additional plant at their works in Bradford Road, the object being to supply power to the British Electric Traction Company for the running of the cars shortly to be introduced. The town clerk stated that the population of Dewsbury at the last census was 28,660, the rateable value 129,738*l.* and the area 1,460 acres. The value of the borough 136,521*l.*, the assessable amount of loans outstanding under the Public Health Act was 110,260*l.* the limit of borrowing powers being two years' rateable value and there remained unexhausted for the purposes of the present application 149,216*l.* Replying to a question by the inspector he stated that the total amount sanctioned to be borrowed for electric-lighting purposes was 41,420*l.*, and that of the 10,000 proposed now to be borrowed all but a very small proportion would be used for traction purposes. This would involve the provision of extra plant, equivalent to 300 kilowatt capacity with adequate "spare."

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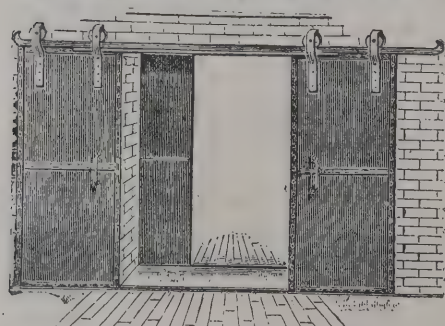
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### BUILDING AND BUILDERS.

THE erection will shortly be commenced of a bridge across the river Swale, Yorks, midway between Skipton and Morton bridges, where the need for such a means of communication has long been felt. It will cost about 4,000*l*.

MR H ELLIS (town clerk of Dewsbury) has received the sanction of the Local Government Board to an application made by the Corporation for power to borrow 5,700*l*. to defray the cost of erecting a covered market. The market will be erected on a plot of land opposite the Great Northern Railway passenger station.

AT Girvan, N.B., on Saturday last, the memorial-stones were laid of a new Wesleyan church in Dalrymple Street, which will provide accommodation for 400 worshippers, and will have a classroom in addition. The architects are Messrs. Watson & Salmond, Glasgow, and the entire cost will be 5,000*l*. The builder is Mr. Blair, Girvan.

THE foundation-stone was laid on the 18th inst. of a new Sunday-school which is being erected in connection with the Primitive Methodist church, Bloxwich, Walsall. The new school, which will cost a little over 2,000*l*., including the site, is being erected from the designs of Messrs. Hickton & Farmer, Walsall, who also designed the chapel, which has only been erected a few years.

THE fire station which has been erected in Hales Street, Coventry, is now practically complete, and the brigade will soon take possession of their new home. It is a commodious building, offering every convenience, and quite in keeping with the growth of the city. On the ground floor the accommodation consists of main engine-house for the reception of the fire appliances, a covered yard, stabling for six horses, &c., while upstairs is a recreation-room for the members, committee-room, storeroom, &c. Three cottages adjoining will be occupied by the engineer and the horse-drivers. The total cost of the building is about 6,000*l*.

THE dispute between the builders and joiners at Bradford ended last week, after lasting fifteen months. At the beginning of August the men accepted the mediation of the Board of Trade, and Mr. G. R. Askwith went to Bradford last week and took evidence on both sides. It was understood that the masters would not offer less than 8½*d*. per hour, and that the men would not ask for more than 9*d*. The arbitrator has decided upon the rate of 8½*d*. per hour. Before the dispute

the men were receiving 9*d*. The cost to the men's society has been 15,000*l*.

THE standing joint committee of the Staffordshire County Council have decided to recommend the latter body to sanction the agreement entered into with the Smethwick Town Council to purchase a site in Crockett's Lane, Smethwick, containing 2,500 square yards, from the Harborne Charity Trustees, for the purpose of erecting new police buildings. It is expected that as soon as the site is purchased the scheme will at once be commenced. A police court will not be built, although provision will be made upon the site for such a building in the event of the existing premises at High Street not meeting the requirements. The buildings will be erected by the County Council, and the Town Council have agreed to purchase them at a valuation if at any time a transfer should be rendered desirable.

MR. H. R. BICKNELL, one of the inspectors of the Local Government Board, held an inquiry at the Batley town hall regarding an application by the Town Council for sanction to borrow 5,038*l*. for the erection of a new refuse-destroyer in New Ing fields, and 2,210*l*. for street improvements in the district of Mount Pleasant. The destructor and electric-lighting works are being erected side by side, and it is the intention to utilise steam from the former to generate electricity for traction and lighting. Mr. John Illingworth, a member of the Town Council and an ex-mayor, opposed the application as far as the destructor was concerned. He said that with the expenditure of 1,500*l*. or 2,000*l*. the present works in Bradford Road could be made available for all necessary purposes.

EXTENSIVE harbour improvements have just been completed at Bridgeness. These consist of the construction of a new wharf on the north side of the Bridgeness colliery and of an elevated loading place by which steamers can be served from railway waggons instead of from small colliery waggons hitherto in use. The wharf, which is about 400 feet long, is formed on a line running eastwards at or near the low-water level of ordinary spring tides, which rise and fall about 18 feet here. The berth where the vessels are to lie has been sheet piped between the long piles, so that it can be dredged outside. A Priestman dredger is employed by which the dredging is being carried on at present, and as soon as it is finished vessels will be able to use the harbour regularly. The dredgings are being used for the purposes of reclamation, about

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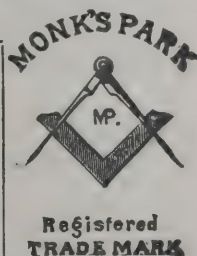
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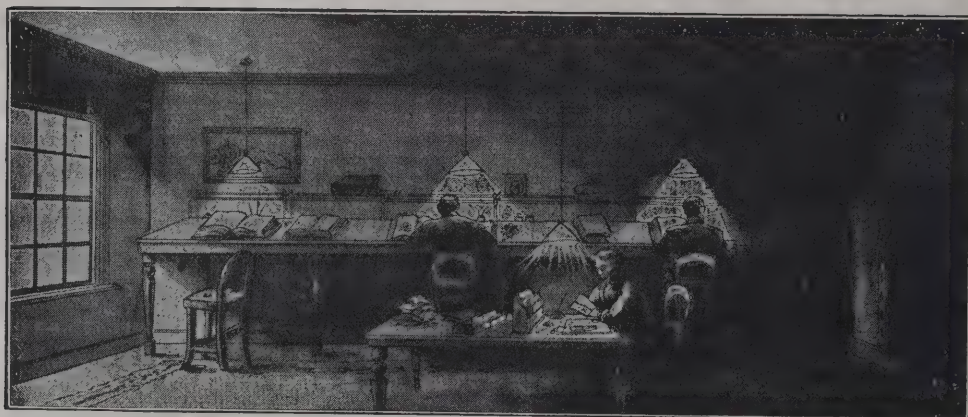
THE city buildings sub-committee of the Leeds Corporation met recently for the purpose of considering the report sent in by Mr. Leonard Stokes, architect, London, with regard to the suggested rearrangement of the Town Hall and the Municipal Buildings. The subject involves the question of new Law Courts, which the municipal authorities have had before them for some considerable time. One scheme submitted by Mr. Stokes entails the placing of the Public Library and News-room in new premises, as well as extensive alterations in the Art Gallery and its approaches, in order to get more light and air into the building. With regard to the Town Hall, the Council Chamber would be placed where the Civil Court now is, and the present Council Chamber would become a tea-room, the whole length of the west side of the ground floor being set apart for the Lord Mayor's reception-rooms. Another scheme places the Council Chamber, Lord Mayor's rooms and Town Clerk's department from the Town Hall to the Municipal Buildings. The City Police-court would be given up to the West Riding magistrates, whilst the Council Chamber would be converted into a Coroner's Court. This scheme would necessitate the erection of new police-courts and offices, which, it is suggested, might cost 50,000*l.*, exclusive of the site. In course of the meeting, which was under the presidency of Mr. Peate, the position was discussed, and it was decided to call a meeting, to which the heads of the various departments affected would be invited, in order that the subject might be properly ventilated.

MR. M. K. NORTH, on behalf of the Local Government Board, held an inquiry at Wolverhampton on the 26th inst. into the application of the Town Council for sanction to borrow 5,500*l.* in connection with the improvement of the town hall and public offices, 3,229*l.* for purposes of street improvement in New Hampton Road, and 3,000*l.* in respect of the new covered wholesale market. There was no opposition shown. Mr. H. Kendrick (assistant town clerk) stated that the original loan applied for respecting the town hall alterations was 11,074*l.*, but that was before the receipt of the builders' estimate, which amounted to 12,655*l.*, and several items of additional expenditure were also included. With regard to the second amount, it was explained that the holding of the Wolverhampton Art and Industrial Exhibition rendered the immediate laying of a double line of track in the New Hampton

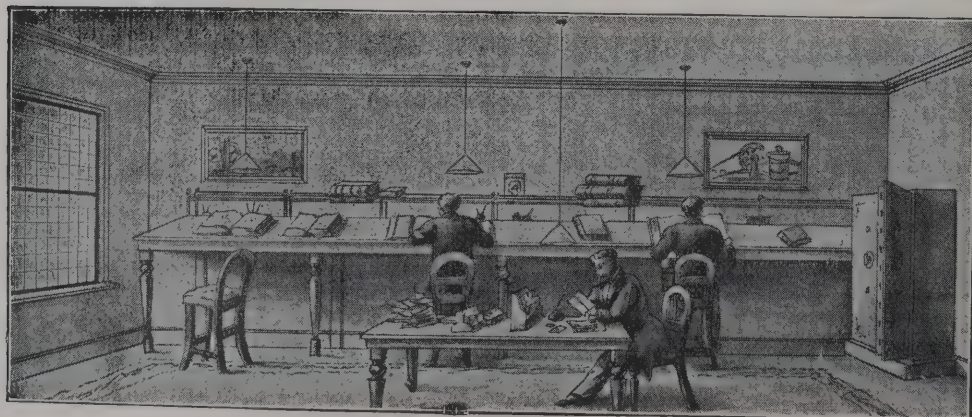
Road necessary, and this necessitated the purchase of property. With regard to the covered wholesale market, the Local Government Board last year sanctioned a loan of 13,850*l.*, and allowed twenty-six years for its repayment. Since that date several alterations had been thought of with a view to the increased usefulness and efficiency of the market and the augmentation of revenue. The cost of the scheme had been increased by 3,000*l.* Mr. George Green, the borough engineer, gave evidence in support of the application, and later in the day Mr. North inspected the various sites.

A LOCAL Government Board inquiry was held on Tuesday by Col. A. J. Hepper, D.S.O., R.E., at the Municipal Offices, Dale Street, Liverpool, into an application by the Corporation to borrow 20,000*l.* for extra work not included in the original estimate of 100,000*l.* for the extension of the museum and the erection of the technical schools. Mr. E. W. Pierce (deputy town clerk) supported the application, and there were present Mr. Morris P. Jones (chairman of the museums sub-committee), Mr. J. Harrison Jones, C.C., Alderman Stolterfoht, Mr. Thos. Utley, C.C., Mr. Philip H. Holt, Dr. Forbes (director of museums), Mr. W. Hewitt (director of technical instruction), Mr. Peter Cowell (librarian), Mr. H. Edwards (chief committee clerk), Mr. E. P. Pugh (accountant's department) and Mr. E. W. B. Mountford (architect of the technical schools). In 1893 the Corporation commenced the museum extension and the erection of the technical schools. During the progress of the work the original plans were altered to meet unforeseen contingencies or to effect minor improvements which were suggested as the building proceeded. Two extras which absorbed considerable sums were the provision of accommodation for the Nautical College in the new technical schools and the underpinning of part of the wall of the old museum building which was found necessary before the extension could be proceeded with. The St John's Churchyard improvement scheme had also necessitated some modification of the plans of the museum building consequent on the removal of the plateau and the forming of a terrace. Besides the original estimate of 100,000*l.*, the Corporation had borrowed 22,000*l.* for fitting the museum extension and 14,000*l.* for equipping the technical school. Mr. Morris P. Jones and Mr. J. Harrison Jones gave evidence as to the necessity for the expenditure, and Mr. Mountford, the architect, explained in detail the reasons for the extra expense being incurred. The inspector subsequently visited the buildings.

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A VERY complete installation of passenger and goods lifts has been provided by Messrs. A. Smith & Stevens, of Battersea, for the new premises for Lloyd's Registry of Shipping in Fenchurch Street, which is a sufficient testimony to the excellence of their system.

DURING the Shah's recent visit to London, Messrs. Ewart & Son, Ltd., 346 Euston Road, N.W., were favoured with an order from His Imperial Majesty for one of their well-known "Success" oil geysers, to be shipped to His Imperial Majesty's Palace at Teheran.

**VARIETIES.**

OPERATIONS have been commenced for clearing the site of the Westminster improvement, by which a boulevard will be formed from Abingdon Street to the Embankment.

A RELIC of the recent war has been received at the British Museum in the shape of the coat-of-arms of the late Orange Free State, which used to hang over the Court of Justice in Bloemfontein. The arms are beautifully executed in wood, and form a very handsome piece of carving.

THE final arrangements have now been made by which the Imperial Life Insurance Company and the Alliance Assurance Company become one and the same company. By this amalgamation it is anticipated that a very large amount will be saved in the carrying on of these two very prosperous insurance companies.

A WELL-ATTENDED meeting was held in the chapter-house, Ripon Cathedral, on the 21st inst., with the object of forming a committee to promote the erection of a permanent rearedos at the east end of the cathedral. It was resolved that the rearedos should take the form of a memorial to the men of the diocese who have fallen in South Africa.

ON the 23rd inst. Mr. J. W. Webb, chief mechanical engineer of the London and North-Western Railway, opened at Crewe an exhibition of science and art apparatus and works of art from the Victoria and Albert Museum, South Kensington, and the City and Guilds of London Institute, in inauguration of the opening of a large new suite of classrooms at the Mechanics' Institute.

THE new parish church of Fortingall, N.B., was formally opened on the 23rd inst. by the Rev. Dr. Russell, moderator of the General Assembly, in presence of a large congregation. The new church, which is simple in style, in harmony with its picturesque surroundings, will accommodate 200 worshippers and has cost about 4,000/. It is distinguished more by its substantial construction than by any degree of ornament. In a niche behind the pulpit an interesting relic—the old Celtic vesper bell, supposed to be about 1,000 years old—is preserved.

A NEW block of buildings at the Royal Northern Sea-bathing Infirmary, Scarborough, was opened on the 21st inst. The new portion is situate at the rear of the main building, and one-half of it consists of wards and the other half of a chapel. The total cost of the work is estimated to be 2,125/. The accommodation of the institution is now for 105 patients—59 males and 46 females. When founded in 1812 six patients only were provided for. Prior to the opening ceremony the chapel was dedicated.

THE Photographic Survey and Record of Surrey is the name of a useful little association which was inaugurated in May last and of which the first president is the Right Hon. Viscount Midleton, Lord Lieutenant of the county of Surrey. The very praiseworthy object of the Association is to preserve by permanent photographic process records of antiquities, anthropology, buildings of interest, geology, natural history, passing events of local or historical importance, portraits of notable persons, old documents, rare books, prints, maps and scenery, so as to give a comprehensive survey of what is valuable and representative in the county of Surrey.

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"MERRIE ISLINGTON" was on Tuesday evening plunged into dismal darkness owing to a fire which occurred at the Borough Council electric-light station, Eden Grove, Holloway Road. The outbreak was on the ground floor, and an alarm was at once given. Within a few minutes there were upon the scene a number of fire-engines from the neighbouring stations, and attention was mainly directed to preventing the spread of the flames to the upper part of the building. In this they were successful, and the principal damage was to the ground floor and contents, comprising a large quantity of electrical machinery. Practically the whole of the electric light in the borough was extinguished, and many shopkeepers were compelled to close their premises for want of light.

THE Government grant having been continued for the purpose, repairs are again being carried out on the old Royal Palace at Linlithgow. The suggestion made by Lord Rosebery to restore the ancient structure as a national memorial to the late Queen Victoria has not, so far, been acted upon, but the Board of Works seem resolved to devote attention to the work of repair and preservation by which in recent years considerable good has been done in the way of protecting the old pile against the ravages of wind and weather. The contract this year is in the hands of Mr. Alex. Marshall, builder, Polmont, who is strengthening the north side of the building nearest the loch, and effecting such other repairs as may in the meantime be deemed necessary.

THE North Pier at Roker, Sunderland, which has been under construction fifteen years, is now practically completed, and the River Wear Commissioners have agreed to take steps to invite the Prince of Wales to lay the last stone. Yesterday afternoon three granite-faced concrete blocks, each weighing 57 tons, and forming part of the round head at the pier end, were laid by three venerable members of the commission, whose combined ages reach 259 years. They were Mr. R. M. Hudson, chairman of the traffic committee, aged eighty-nine; Mr. G. R. Booth, chairman of the finance committee, eighty-six; and Mr. Robert Thompson, chairman of the works committee, eighty-four. These octogenarians are still vigorous, and when Mr. Booth laid his block he struck the mallet with such force against the masonry that he was jocularly exhorted to be careful.

A PRESS view of the new theatre in Ayr took place on Monday. The new building is situated in Carrick Street on a site near to where the old wooden erection stood. The main entrance is in

Carrick Street, the other entrances being to the side of a proposed new road. The house consists of pit, orchestra stalls, dress circle, upper circle and gallery, while there are four boxes. The dress circle, upper circle and orchestra stalls are approached from the main entrance, which contains a commodious vestibule, and in which a ladies' cloak-room and lavatory is placed, as also the manager's room. On the opposite side of the vestibule are pay-boxes for all parts of the house. On the other floors ample provision is made for lavatory, cloak-rooms and lounges. The house comfortably seats about 1,200 persons. The stage is a very large one, being the full width of the house, 47 feet, and 30 feet deep, provision being made in front for orchestra, and there is also a commodious stage pit. A complete system of ventilation has been carried out both in inlet and exhaust throughout all parts of the house, which is heated by radiators. The auditorium is fireproof, and provision is made in the event of fire to completely cut off the auditorium from the proscenium.

SIR WILLIAM MATHER, M.P., presided at the annual meeting of Messrs. Mather & Platt, Ltd., held at the accountants' rooms, Manchester, on the 21st inst. In moving the adoption of the report, the Chairman said that the results of the business for the past year justified the policy of having several district branches of engineering and machine-making within one concern, instead of solely depending on one, for in a time of partial depression such as the trade had been subject to during the past year, among the branches there might be one or more not affected by adverse conditions of trade, consequently an average of satisfactory results might be maintained from year to year on the working of the whole enterprise. The report was adopted, and it was agreed that the disposable balance of 83,218*l.* should be appropriated as follows:—Dividend of 5 per cent. per annum on the preference shares for the half-year to June 30 last, 8,126*l.*; dividend of 7 per cent. per annum on the ordinary shares for the year, 28,000*l.*; transfer to reserve account, 30,000*l.*; carried forward to next account, 17,092*l.* The directors were congratulated by the shareholders upon the successful results of the year's working.

THE Cambrian Archaeological Society in connection with their annual meeting went for an extended excursion on the 20th inst. Leaving Brecon at nine in the morning, the antiquaries first visited Llanthw, where the ancient cruciform church and the remains of the palace of former bishops of

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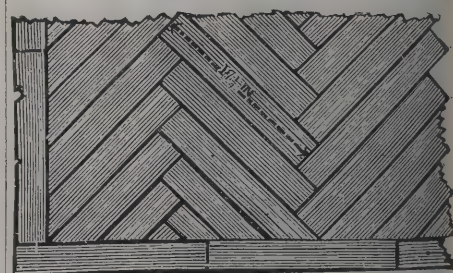
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St. David's (also of Giraldus Cambrensis, the distinguished Archdeacon of Brecknock) were fully explored. Departing from Llanthw the party journeyed to Talgarth, visiting *en route* Llanfillo Church (dedicated to St. Milburg, daughter of Morwald, king of Mercia), Bronllys Church (with its detached tower standing two yards from the rest of the building), and Bronllys Castle, with its round tower (supposed to be of Syrian architecture). At the latter place an historical paper was read by Mrs. Dawson, daughter of the venerable Archdeacon of Brecon. At Talgarth the church, where rest the remains of Howel Harris, of Trevecca, was seen, and its objects of interest examined, including the memorial tablet on the chancel wall to the great Welsh revivalist. Leaving Talgarth the ruins of Gwernyfed Hall, with its terraces and gateways, were visited. Here in 1645 the late Sir Henry Williams entertained King Charles I., the chair in which that monarch sat being preserved at Gwernyfed mansion, the home of Colonel T. Wood. By invitation of Colonel Wood the party lunched at Gwernyfed, and afterwards proceeded to Llangorse, calling at Trevecca on the way and viewing the house in which Howel Harris lived. At Llangorse the church and inscribed stones, and also the crannog (ancient lake dwelling) in Llyn Safaddau (Llangorse lake) received attention, after which the party were entertained to tea by Mrs. Bradley, of Cefn Park, and afterwards returned to Brecon.

### SANATORIA FOR CONSUMPTIVES.

At the Public Health Congress on Tuesday a paper was read by Dr. Frank Bushnell on "Sanatoria for Consumptives." He said that in order to prevent the collection of dust and to permit of daily cleansing and disinfection of the building, there must be no sharp angles present, no mouldings, ledges or cornices, no unnecessary ornamentation, no elaborate joiners' work; the walls, floors and ceilings must be washable, the furniture and equipment must be of the simplest kind, cupboards which are difficult to clean avoided, and carpets, mats and curtains used most sparingly. A steriliser must be provided. Plenty of sunlight must be admitted to the rooms and the windows be large. Permanent building material is recommended, and the sanatorium should be situated on the southern slope of a hill of fair elevation, on dry soil, and protected from cold winds. Sanatoria should be provided and maintained by the combined action of the charitable public, sanitary

authorities and Poor Law authorities. In conclusion, he said:—Both the provision of sanatoria and hospitals for consumptives and laboratories for testing and reporting on sputum would entail a large expenditure of public money, and such measures can only be recommended if a vigorous and general effort be made to reduce the prevalence of the disease to its lowest extent. It is with this proviso that he drew the attention of this section of the Congress to the country house and grounds which have been recently purchased on South Dartmoor as a sanatorium for consumptives. An excellent site exists on it for a modern sanatorium to be built as funds allow. With the belief that it will relieve the urgent need of accommodation and serve as an object-lesson, it has been acquired, and the number of beds and future work of the Institution depends on charitable individuals and public bodies.

Mr. Harbottle Reed, architect, said there appeared to be a consensus of opinion upon the desirability of the site for a sanatorium possessing the following advantages:—Abundance of pure fresh air, a maximum amount of sunshine, shelter from winds, dry and well-drained soil, remoteness from roads or ground productive of dust, privacy and quiet, grounds of sufficient extent to permit of walks. For the disposition of the buildings there was no accepted standard plan, but they might be placed in four groups:—(1) The large self-contained block; (2) the connected pavilion type; (3) the disconnected pavilion type; (4) the chalet system. In the component parts, the first consideration was the patients' bedrooms, best placed on the south front with only a corridor behind them, and this latter should have a sufficiency of opening windows as well as doors at the ends. A floor space to each room of about 120 to 150 superficial feet and a cubic space of about 1,200 to 1,400 seems a fair allowance, but cubic space is secondary to thorough ventilation, and to insure this about half of one wall should be window space, and for the ground-floor rooms French casements reaching to the floor with fanlights over gave best results, enabling patients with their beds to pass directly into the open. Several methods had been tried for cross ventilation, including air ducts through the corridor from the outside of the north wall; the bedroom doors had been made with panels to admit the air, but a hopper fanlight over the door was perhaps as effective as any, if the windows of the corridor were placed opposite each bedroom door; the hopper also showed if the lights were unduly used. In the chalet system, with windows on three sides and a door on the fourth, there was no trouble in this respect. Radiators ap-

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peared to present the easiest solution of the warming problem. Then the ordinary precautions observed in hospital construction should be enforced with regard to wall surfaces, rounded angles, abolition of mouldings and impervious floors. The dining-room must have ample windows on at least two sides and three where possible, and if placed away to the north of the main block considerable sunshine would be obtained. Electric fans are useful in large rooms. Means of isolating and nursing grave cases were sometimes desirable, as in a hospital. Verandahs were useful if properly placed, but their value was decreased if they were placed in front of the patients' rooms and covered with an opaque roof. The verandah should, besides being ventilated, be well warmed, since patients can be so wrapped in warm clothing and provided with hot bottles as to enable them to lie out of doors during the winter. Seeing that the source of infection was the sputum, provision should be made for its reception and destruction, and frequent disinfection of the rooms was also recommended. The limit of accommodation was a debateable point, to be settled by medical authorities, some of whom favoured a maximum of forty patients, with a separate bedroom to each. Furniture was a point on which much care was exercised, to keep as plain and free from dust as possible. One recently erected sanatorium for twenty beds cost about 325*l.* per bed, and an additional block for eight beds would only cost 150*l.* per bed.

Dr. Sergeant, medical officer to the Lancashire County Council, said he should recommend his Council to adopt for a proposed sanatorium a permanent administrative block, which could be extended and associated with a village of chalets, and he should recommend that patients should be called upon to pay 1*l.* a week, either themselves or through friends or societies, towards the maintenance expenses.

Mr. MacDonald, city engineer of Glasgow, said he had been impressed with the advantages of absolute isolation of the different departments of a sanatorium.

Mr. A. Wheaton, Heavitree Urban Council, thought the County Council was the natural body to initiate and carry out sanatorium schemes, for the smaller public bodies were not only without power, but were without the knowledge necessary. Information concerning the disease should be spread broadcast and some sort of notification adopted.

Mr. Clarke, surveyor to Dawlish Urban Council, said that body had adopted voluntary notification of phthisis, in which medical men loyally co-operated.

Mr. Cameron (who had taken the chair on the departure of

Mr. Mawbey) said he was a believer in preventive rather than curative arrangements, and to this end better education should be given to the public on the general question of health. The public should be taught that civilisation meant hard work in this direction, and that it was absolutely necessary that great care should be given to the body. As to materials of which sanatoria should be built, there was an old British saying that when men lived in houses of reeds they had constitutions of oak, but that when they lived in houses of oak they had constitutions of reeds. Free access to open-air was essential to the care of the body, and in this direction there were many things that might be improved. One thing he had been struck by recently in making inquiries concerning workmen's dwellings was the necessity for a more economical method of building; and in the same way, if sanatoria were to be such as to require patients to pay 3*l.* or 4*l.* a week they would be beyond the reach of the greater number of people who required them.

Mr. Bushnell, replying to the discussion on his paper, said a Ministry of Health would certainly be established some day, and so probably would compulsory notification of phthisis, in which Norway and the United States had led the way.

### DURHAM ARCHITECTURAL AND ARCHÆOLOGICAL SOCIETY.

THE Architectural and Archæological Society of Durham and Northumberland held their third country meeting of this season at Alnwick, Edlingham and Hulne Abbey, and being favoured with fine weather spent an agreeable day.

Assembling at Alnwick station, the party drove first by the hillside round to Edlingham, finding, en route, much to interest them. On the one hand were the rugged hills, with their wealth of heather and bracken, while on the other the broad valley, with the Cheviots looming in the background, formed a picturesque study in green, on which the eye rested in pleased complacency. Indeed, in the bright morning nature looked her best, while art, in the form of the ancient church and castle which distinguishes Edlingham, received enhanced attraction. Dr. Greenwell, the president, happy in reminiscence, cited the history of the church from the year 737, when it was built and given to St. Cuthbert by Ceolwulf, king of Northumbria.

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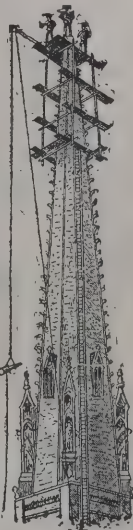
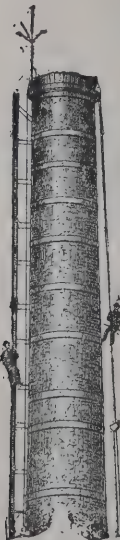
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Gospatric the Second, he said, had it from Henry I. as part of the barony of Beanley, and subsequently it came through Edward, his son, and Walthoof, his grandson, to descendants who took the name of Edlingham. From the latter family the President traced the possession to the Feltons, the Hastings and latterly the Swinburnes. The President's remarks were supplemented by Mr. W. H. Knowles, of Newcastle, who, in describing the architectural features, drew attention to the perfect harmony of the church with the wild and picturesque scenery by which it is surrounded. The edifice is dedicated to St. John the Baptist, and comprises a chancel, nave, with north aisle, west tower, south porch and a modern vestry. The earliest portion of the existing fabric is no doubt the west wall of the nave, now enclosed in the tower. Edlingham, in the opinion of both Dr. Greenwell and Mr. Knowles, must have possessed a church in Anglian times, although no portion of the existing building can with certainty be attributed to that period. However, the portion of a sculptured memorial cross, which was found by the vicar (the Rev. J. W. Russell) near a spring in the glebe field, about 500 yards from the church, and which once stood in the adjacent cemetery, seems to be proof conclusive. The ornamentation upon the cross resembles that on cross shafts found at Hexham, Stamfordham and other places, and may be attributed to the eighth century. The ruined castle, in Mr. Knowles's words, is "one of the few larger peel towers which can pretend to possess some details of architectural merit, being in this respect much richer than the church, which is, however, of an earlier date." Both the castle and church were carefully inspected, and then a move was made for Bolton, where the little chapel, with its Norman church arch, claimed attention. It was near this spot that the Earl of Surrey in 1513 was joined by the noblemen and gentlemen of the North of England to the number of 26,000 men four days before the battle of Flodden Field was fought. The chapel was founded in 1225 and dedicated to St. Thomas the Martyr. From Bolton the journey was continued to Hulne Park, where, by permission of His Grace the Duke of Northumberland, the ruins of the Carmelite abbey were examined. Built in 1240, the remains of the church, chapter-house and domestic buildings are still in existence, and, with Mr. Knowles as guide, a pleasant half-hour was spent in the vicinity. Then the brakes were once more boarded and the party returned to Alnwick, pleased with their peregrinations and ready for the excellent repast which was served before they separated at the Star Hotel.

## INTERNATIONAL FIRE EXHIBITION AT EARL'S COURT, 1903.

THE arrangements for the International Fire Exhibition are progressing rapidly, the British Fire Prevention Committee's scheme having met with the greatest encouragement on all sides, particularly in Government, scientific and engineering circles.

The Duke of Marlborough, K.G., as president of the National Fire Brigades Union, will act as vice-president of the advisory council, and Mr. Edwin O. Sachs, as chairman of the British Fire Prevention Committee, will act as chairman of the executive. Mr. Marsland, hon. secretary of the Society of Architects, will perform the duties of hon. secretary of the Exhibition.

Among those who have consented to act on the advisory council, the majority of whom have expressed their intention of taking an active part in the work, are the President of the Royal Society, Sir William Huggins, O.M., the Presidents of the Institution of Mechanical Engineers, the Institution of Electrical Engineers, the Chemical Society and the Institute of Chemistry; as also Sir Douglas Fox, past president of the Institution of Civil Engineers; Professor Aitchison, past president of the Royal Institute of British Architects, and the President of the Royal Navy League. Among Government officials we notice the names of Sir John Taylor, K.C.B., consulting architect, and Mr. Tanner, principal architect to H.M. Office of Works; Colonel Bainbridge, C.B., chief superintendent of H.M. Ordnance Factories; Captain Thomson, chief inspector of explosives; Dr. Thorpe, F.R.S., principal of the Government laboratories; Dr. Whitelegge, C.B., chief inspector of factories; Sir James Williamson, C.B., director of H.M. dockyards; Mr. Gavey, engineer-in-chief of the General Post Office, and Sir W. H. Preece, K.C.B., consulting engineer of the same department.

The historical side of the exhibition will be represented by Sir Edward Maunde Thompson, K.C.B., director of the British Museum; Sir Henry Maxwell Lyte, K.C.B., deputy keeper of the Public Records, and the President of the Archaeological Association; while amongst exhibition experts we find the names of Sir Henry Trueman Wood, Mr. Dredge, C.M.G., and Mr. Isidore Spielman; and among the scientists and electrical engineers not named above, Sir Henry Lockyer, F.R.S., Major-General Festing, F.R.S., Professor Ray Lankester, F.R.S., and Commandatore Marconi. The interest of

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art will be entrusted to Sir Wyke Bayliss, president of the Royal Society of British Artists, and Mr. Lionel Cust. Sir Henry Irving and Mr. Moss, of the Hippodrome, will represent the important question of safety of life from fire in our theatres and places of public amusements. Lastly, representative members of the fire salvage and ambulance services include Major Fox, chief of the Salvage Corps; Lieutenant-Colonel Seabroke, chairman of the National Fire Brigades Union; Lieutenant-Colonel Dixon and Mr. J. H. Dyer, vice-presidents; Mr. Folker, hon. secretary of the same body; and Captain Dyson, of the Windsor Fire Brigade, the ambulance section being represented among others by Colonel Sir Herbert Perrott, Bart.

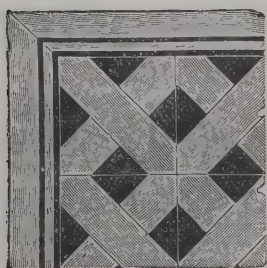
As to foreign representatives acting as local corresponding committees to the councils, the full lists are not yet to hand except in the case of Germany, where we find, among others, the names of the Director of Public Works, the chief officer of the Berlin Royal Police Fire Brigade, the chief officers of the Hamburg and Bremen fire brigades and several eminent architects and engineers.

### HOUSING OF THE WORKING CLASSES.

At the Conference of the Royal Institute of Public Health at Exeter on Monday, the section devoted to Municipal and Parliamentary Hygiene met for the first time, the president being the mayor of Plymouth, Mr. J. A. Bellamy. In his opening address, the President said that there was an ever-increasing desire to make life in our towns more healthful for the poor as well as the rich. The problem ever present, however, was, in the first place, the education of public opinion, and, in the second, that of cost. The question was, What could be done by means of the machinery provided by municipalities or by Parliament to make days better than they were for those who lived in towns and cities? Abundance of pure air and water, a perfect drainage system, and personal cleanliness would practically solve the problem. The starting-point of a municipality desirous of doing its duty in this respect should be the appointment of a medical officer whose wholetime should be devoted to the duties of his office. From the varying conditions in some towns compared with others, the lack of courage on the part of the Local Government Board, and the impracticable conditions imposed by that department, very little progress had been so far made in providing the poor with dwellings where they could get plenty of pure air to breathe. The terms for the repayment of loans should be extended, and

municipalities should be allowed to erect such dwellings as they pleased and as they might think best suited to local requirements. On the subject of the spread of infectious diseases, he said that the supervision of the milk supply to towns was generally very inadequate, and inasmuch as milk might convey the germs of typhoid fever to the inhabitants of a whole district, he thought that municipalities should have power to examine all dairy farms from which milk was provided. In conclusion, he urged the importance of public baths, muscular training for the young, and the adoption of methods to prevent the depopulation of country districts.

In a paper on "The Housing of the Working Classes," Mr. J. W. Spear, M.P., said that private enterprise and philanthropic methods might do something, but could not unaided do more than touch the fringe of the question. The State had a duty before it. While good work had been done by municipalities and local governing bodies through the extended power to build houses and assist the occupiers of small houses, failure to cope with the real evil was very marked, which might be partly due to natural causes and partly to the artificial condition with which the powers of the local bodies were hedged and hampered. Owing to the cost attendant upon erecting workmen's dwellings in towns, he suggested that municipalities should purchase land in the country for the purpose, and as this would necessitate much more regular, constant and rapid transit from the centre to the outskirts, he urged that when municipalities were engaged in street improvements they should work with a view also to opening up of definite and easy modes of ingress to and egress from the town. In clearing and renewing houses, the very poorest men and women in casual work and unable to pay the cost of journeying to the suburbs were rendered homeless. This resulted in greater overcrowding still in another area, and it was surely this class which really needed attention. Was it not desirable that some less expensive houses than those required by the Local Government Board should be allowed to be erected by the local authorities, who should have power to build dwellings simply in accordance with their own by-laws? He suggested an extension of the time for the repayment of loans. A terrible part of the overcrowding in towns was due to people flocking in from the country. He asked whether our system of education had not tended to induce this migration, and said he was hopeful that in this respect our educational system would be recast, and while giving every opportunity to the clever lad to rise to the highest honours, it would be made more practical, useful and



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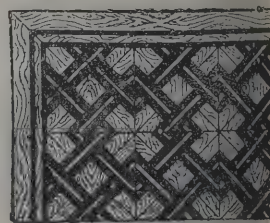
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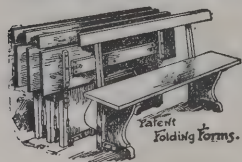
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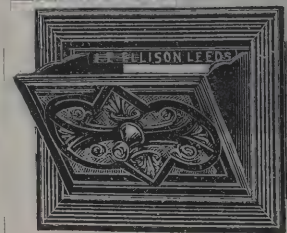
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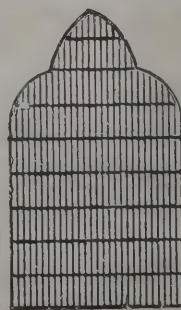
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would do something to enhance the value of the work performed in country districts.

"The Treatment of Slum Populations" formed the subject of a paper by Mr. Paul Swain, chairman of the sanitary committee of the Plymouth County Council, who said that in the majority of cases failure, he thought, had been the result of efforts of municipalities to provide dwellings for the working classes. Houses, as a rule, built for people displaced had not been occupied by those for whom they were intended. The result was the creation of a fresh slum. It was worse than useless to attempt to transplant this decadent mass of humanity from their congenial surroundings of squalor and misery to the serene atmosphere of municipal homes, built on the approved system of the Local Government Board. As an alternative, instead of abolishing slums they should be reformed. For a comparatively small sum many of these houses could be repaired and put in order, as had been done in Glasgow. It would be cheaper and more practical for municipal bodies to acquire slum properties and to utilise them in this way rather than to spend large sums of money in building houses for the working classes, which hitherto had proved gigantic failures. But there must be firm control and a fearless and impartial treatment of all slum landlords. The good work of Glasgow was an admirable example of what might be done by private efforts. It would be quite feasible for all large towns to combine private effort with municipal authority. Why did not the various parochial organisations and philanthropic societies ally themselves with the municipal officers in their work amongst slum populations?

Mr. H. Tozer, vice-chairman of the committee for the housing of the working classes, Westminster, said where the duty of individuals had failed in providing sufficient housing accommodation for the labour employed, it became the duty of the authorities to supply the deficiency. There existed a direct mandate to this effect from the King. Statistics were too strong to be ignored, and showed incontestably the necessity of systematic dealing with the present condition of working-class housing. It was more than a necessity. To-day it was an evil; to-morrow it might become a peril. The academic question was often raised as to how far municipalities should take upon themselves what might seem to be the duty of traders. Was not this the right axiom that municipal trading was justified and advisable where such things as were vitally necessary to the health and well-being of a community were inadequately provided by private enterprise, whether it

were water, public lighting, tramways and other locomotion, housing of the poor, or other things? Our commercial supremacy, which depended in a great measure upon our raw labour, was seriously threatened, and it behoved us *inter alia* to wake up to the necessity of labour being properly sheltered. A cheap and efficient system of locomotion offered the most immediate and least experimental, though not complete, solution of the housing problem. As a nation we were slow to recognise the urgency or necessary extent of reform, but without being led away by the sentimental excesses of enthusiasts possessing more warmth of heart than coolness of judgment, he saw no reason why this large question should not be solved by persistent energy and earnestness, by the application of common sense and by putting it on a business footing.

Mr. Taylor (Liverpool) proposed:—"This congress urges the Government at the earliest possible moment to give legislative effect to the recommendation of the Select Committee of the House of Commons that the repayment of loans on land and buildings be extended for eighty years."

Mr. McGuffie (Liverpool) seconded the motion, which was carried.

On the motion of Mr. Lawson, chairman of the sanitary committee, Leeds, the following resolution was also adopted:—"Local authorities should have a free hand to erect such buildings as best suit their local requirements, subject to compliance with the approved sanitary by-laws."

Mr. T. Poyntz Wright, of London, read a paper on the desirability of appointing a minister of public health, and moved:—"That in the interest of the public the health services of this country require organisation on a system suitable to modern conditions, and that this end would be furthered by the power and influence from the initiative of the Health Department of the Local Government Board being increased, and the department formed into a ministry of public health."

Dr. Bushnill (Plymouth) seconded the resolution, which was adopted.

THE Manchester waterworks committee are seeking to obtain powers to borrow 1,000,000*l.* for the extension of the Thirlmere Waterworks.

THE completion of Govan's Municipal Building scheme was celebrated on the 23rd inst.; the last item, the stables, which have cost 7,500*l.*, were opened. The whole scheme has required the expenditure of 150,000*l.*

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## AMERICAN EXPERIMENTS ON MORTAR.

In connection with the construction of the Wachusett dam, the New York Metropolitan Water and Sewerage Board has been conducting a series of continuous tests of cement which have now lasted for over five years for some brands. The results are summarised in the report for 1901 of the chief engineer, Mr. F. P. Stearns, who also gives the following notes concerning some special investigations:—

In view of the very large amount of mortar to be used in the dam and the importance of having it as watertight and strong as possible, extensive experiments were begun early in 1901, to determine the permeability and strength of mortars made of the natural and Portland cements which were to be used in the construction of the dam, mixed with different proportions of coarse and fine sands.

The experiments on permeability were made by placing the mortar in cast-iron cylinders, 22 inches long and about 6 inches in diameter. After the mortar had set, caps were bolted to the tops of the cylinders and water was admitted to the cylinders between the caps and the mortar with a pressure of 74 lbs. to the square inch. There were 144 cylinders used in the experiments, and the apparatus was so arranged that the water pressure could be applied to twenty-four cylinders at a time. The applied water was first filtered through sand, to remove all suspended matter.

There were 1,494 briquettes made and broken to determine the tensile strength of the mortars. It was found that the use of a sand with a very large proportion of coarse particles and a much smaller percentage of the finer grades makes a mortar both less permeable and stronger than where a larger proportion of the finer grades is used, provided the proportion of sand to cement does not exceed 3 to 1.

In addition to the experiments upon permeability and strength of mortars, other experiments were made to determine the relative strength of mortars used immediately after wetting and mixing, and when used at different intervals up to two hours after they are first wet and mixed. These experiments were very extended, as they were made with mortar mixed with different grades of sand, with Portland and natural cement, with slow-setting and quick-setting cement, and with mortar that was worked continuously from the time of mixing until it was put into the moulds, and also with mortar which was not worked after it was mixed until just before it was put into the

moulds. The briquettes were broken at the end of fourteen days, twenty-eight days, and three months after mixing.

It was found that when the cements, both Portland and natural, were so manufactured as to take the initial set slowly, the strength of the mortar was not diminished by a delay of two hours in putting it into the moulds, and when the mortar was worked continuously to the time of filling the moulds, there was an increase in strength occasioned by the delay. When the cements were so manufactured as to take the initial set quickly, the results obtained with the quick-setting Portland cement were not materially different from those obtained with the slow-setting cement, except that when the mortar was not worked there was a slight loss of strength in the briquettes moulded at the end of one and a half and two hours, and at no time was there much gain in strength occasioned by delay in filling the moulds. The results obtained with the quick-setting natural cement were less favourable, as the briquettes broken at the end of fourteen days showed a great loss of strength when there was much delay in moulding the briquettes. At the end of three months, however, the briquettes made with mortar which had been worked continuously from the time of mixing showed slightly greater strength than that put into the moulds immediately, and the loss of strength of the mortar not worked was not very marked except for the one-and-a-half and two-hour periods.

## A FRENCH LIGHTHOUSE.

THE new lighthouse just completed on the Isle Vierge, off the coast of Brittany, has the distinction of being the most lofty yet erected. The new lighthouse stands in close proximity to an older one, dating from 1845, which it is intended to replace. L'île Vierge is a rocky islet, situated a little to the east of the river Abercrach, which enters the sea on the north side of the headland off which lies Ushant Isle. The old light, which combined a fixed white light with a revolving red light, was deemed of insufficient power, both from its inadequate optical equipment and from its insufficient elevation. It was therefore decided, says *Engineering*, to replace it by a new light 246.65 feet above ground level, or 4.18 metres of the first order, with a focal plane 75.18 metres (137.1 feet) higher than that of the Barfleur-Gatteville light, and 15.18 metres (49.8 feet) higher than the famous light at Genoa, which, however, dates from the sixteenth century. The masonry for the new structure was



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begun at the end of July 1897, and was finished in a total time of about four years and eight months. The lantern in the meantime had been finished by Messrs. Barbier, and formed a prominent exhibit at the Paris Exposition of 1900. The foundation of the new work is on a granite reef, covered in parts by a sandy bed, varying from 2.50 to 3.50 metres (8.2 feet to 11.5 feet) in depth.

A peculiarity of the masonry lies in the fact that it is constructed of small stones instead of the massive blocks usual in work executed by the Trinity Corporation. This procedure was largely due to the fact that the revenues appropriated by the service of the French Lights and Buoys Department is so small that it has been necessary for the engineers to exercise the utmost economy in the details of their design. Up to a height of three metres (9.84 feet) the tower has the form of a truncated cone, 16 metres (52.5 feet) in the diameter at the base and battered at one in 30. The hollow centre of the tower is uniformly 5 metres (16.4 feet) in diameter from base to crown, and is provided with a stairway secured to the wall, the steps, which are 360 in number, being 31.5 inches wide. The masonry of the base up to the 12-metre (39.4 feet) level is of Brittany granite from the quarries of Kersanton, at which level is commenced the shaft of the tower proper, which rises to a height of 66 metres (216.5 feet). The diameter of this tower at the 12-metre level is 11.40 metres (37.4 feet) and it tapers down to 7 metres (22.96 feet) at its summit. The whole external wall of this shaft is faced with Kersanton granite supplied in small blocks, which have in consequence been lifted and placed with great ease.

At the top of the tower is a platform of ferro-concrete, supporting the sleeping-room of the attendants. A cornice supported by a series of sixteen small arches completes the tower below the lantern, and adds much to its architectural effect. The platform over the cornice is corbelled out for a distance of 1.5 metres (4.92 feet), and is protected by a granite parapet affording a passage 1 metre (3.28 feet) wide around the base of the lantern. This passage leads to the masonry block, in which is lodged a spiral stairway giving access to the lenses. The base of the optical apparatus is fixed at a level of 70 metres (229.7 feet), where it rests on a system of iron beams. The wall is, however, carried up in granite for another 5 metres, and supports at this level the base of the lantern proper. The latter is of the usual type, but it may be added that the foot of the lightning conductor in which it terminates is not less than 82 metres (269 feet) above the base of the tower. As already

mentioned, the masonry is in part of Kersanton granite, which had to be conveyed to the site of the tower in boats. This transport could be made in fine weather only, and had to be stopped in winter. The small size of the stones used was therefore a great advantage. The rest of the tower is also of granite, but the stone in this case was quarried in L'île Vierge itself. The total cost, apart from the optical plant, has not exceeded 300,000 frs, which is very low considering that the tower was built on an islet difficult of access, to which much of the material used had to be transported in boats and discharged under considerable difficulties at the site of the works, and that the work had to be stopped during winter.

### CARE OF MARBLE.

MANY years ago, long before I thought I should have any interest in the stone business, says Mr. G. Barnum in *Stone*, I had occasion to buy a variety of fancy woods. I needed tropical woods like mahogany, rosewood, cocobola, satin and tulip woods. In those days such varieties of wood were not easily obtained. I finally heard of a sawmill in a little village a number of miles from my home, where, I was told, I could obtain what I was seeking. With very little hope of success I made a visit to the mill. I shall never forget my impressions of it. It was a small and unpretentious structure embowered in trees. It was neat and well kept and bore a general air of prosperity. When I entered and examined the stock, I found that the interior and the business methods that ruled were in keeping with the exterior. As soon as a log was sawed the pieces were neatly piled together, just as they lay in the log. As the sawdust had a commercial value it was frequently gathered into bins. There was a minimum of waste, and no refuse lay about under the feet of the workmen. Everything was as neat and orderly as a typical New England kitchen. The entire stock could be examined with very little trouble, and it was very easy to get matched patterns in the wood.

It is years since I have seen the mill, but in an indirect way I have frequently heard from it. A second generation is now in charge of its destinies. It has made no great fortune for its owner, but has given satisfactory returns. The lesson of the mill has always been with me, and I cannot say how often I have thought of it and sighed with regret as my business has led me through the marble yards. There is no apparent

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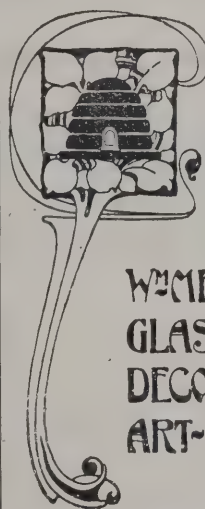
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reason why the same general methods that obtain in this saw-mill should not be followed in the marble yard. That the same care and foresight cannot be found in one marble yard out of a thousand every stone man is aware. The similarity between the wood and the marble is more striking than the differences. In both it is desirable to keep the slabs assembled in the order in which they are cut, in order that the patterns may readily be matched. The wood sawyer knows that if he exposes his stock to the elements, even for a brief time, it will be hopelessly ruined. The marble man is aware that many of the most costly varieties of his stone will be affected by the frosts, but still he will stack his slabs in the open air and trust that they will be off his hands before they have noticeably deteriorated. The only excuse that can be advanced for the marble man is that his stock is cumbersome and difficult to handle. Against this, however, must be considered the fact that by lack of care at the outset it is often necessary to handle stock two or three times over needlessly. There are often direct losses that must be taken into account. To say nothing of stone that is broken by the frost, many dealers will sell a delicate marble at figures they realise are not the most favourable, because they fear to carry it over in their open-air yards. How often large slabs are cut up for a hurry order simply because it is impossible to go through the entire stock for slabs of the required size I would not venture to say.

With all of these points so often brought to the attention of the marble men it is strange that more attempts are not made to overcome the difficulties. There are doubtless many yards that are carefully constructed and well managed, and a fair proportion of them keep their valuable marbles under some sort of shelter. During all my experience, however, I have seen only one that seemed deserving of description as a model yard. This belongs to one of the leading firms in the trade. The marble is stored in a large and admirably arranged building that is kept constantly at an equable temperature by steam throughout the winter. The marble is all carefully assorted according to size, and matched slabs are, of course, kept together. What all of this means in a business way it is difficult to estimate in dollars and cents. I realise that it is impossible for most of the small yards to follow any elaborate system like this, but there is scarcely one where it would not be possible, as well as highly desirable, to give greater care to the storage of marble.

A few instances bearing on this general subject that come to mind may not be amiss. In one of the large yards stood a

block of green marble. It was not needed at the time, and it lay exposed through a very severe winter. In the spring there was need for it, and it was found split to pieces by the frost. Of course, the block was not sound, but if it had not been shattered it could have been used for the purpose desired by backing up the slabs after sawing. Another firm had a large block of the finest imported marble. This was bought years ago, when this particular variety was not as scarce as at present and when prices were low. A short time ago a firm of marble workers had occasion to use some of this marble in a hurry job. They went all over the city, but could not find another block save this. They offered the full market rate for it, but the owners refused to sell save at a very stiff advance, a price that represented at least three times the original cost of the block. The would-be purchaser laughed at the demands and tried once more to secure the desired stone. There was absolutely none to be had, and finally this block was bought, but at a slight advance from the first figure asked. If the block had been treated like most of the marble and kept in the open air it would have been absolutely worthless during the fifteen years that had elapsed since its original purchase. Of course, it would not have been kept in this way, but would probably have been sold at cost price when it was found that it was not immediately needed. The profit made on this one block would pay for the careful storage of thousands of feet of marble.

I have said that the firm that has the model yard is a leading one in the business. I am confident that the growth of its business is in no small part due to the care with which they store and handle their stock. They know exactly what they have on hand, and they can show it to an intending purchaser without a moment's delay. All of this counts for much, and if the smaller yards would follow this excellent example as closely as possible, would classify and arrange their stock and would shelter the delicate marbles so that they could carry them through winter after winter without fear of deterioration, I am sure that they would find their earnings increased. I have always held that stone dealers are apt to give too little consideration to the life of the stone. It may be shattered by blasting, by rough handling or by the weather, but the dealer thinks he is free from blame if the stone goes from his hands apparently sound, so far as a casual inspection shows. It does not seem too much to ask that in the mere storage of the stone, while it is awaiting a purchaser or the workman, it should be treated with the same amount of care and consideration that is bestowed by other tradesmen upon their wares.

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# The Architect.

## THE WEEK.

ALTHOUGH arrangements have been made for the sale of Ordnance maps at post-offices, it is remarkable how few people have taken advantage of the accommodation. In 258 head offices in Great Britain not one order was received. The sales, however, during the past year reached 37,108, a decrease of 84% from the total of the preceding year. The revision of the Survey continues. It is now anticipated that by the end of 1907 the work will be completed for Great Britain, while in Ireland seven more years will be required. The acceleration of the date of completion of the re-survey of Ireland is subject to the condition that the additional buildings required for the increased staff in Dublin, needed to complete publication within a reasonable time after completion of the field work, are provided. These buildings are moderate in size, and their early completion is essential to the efficient prosecution of the re-survey of Ireland within the time estimated. The Ordnance surveyors have to attend to work in other places besides Great Britain and Ireland. Two complete survey sections, each commanded by an officer, have been despatched to South Africa. They are still in that country, and it is believed that they have done very useful work. Three additional survey sections have been formed. One of these sailed for Mauritius in February 1902, and the other two were placed under orders for South Africa in March 1902, and sailed in the following month. A sixth survey section is in course of formation in case its services should be required. In addition to the survey sections above mentioned, twelve non-commissioned officers and sappers have been sent to South Africa for employment as photographers, printers and draughtsmen. Two non-commissioned officers were sent out with the Anglo-German Gold Coast Boundary Commission, and one sapper with the Anglo-French Boundary Commission. Thirteen non-commissioned officers and sappers were, at the instance of the Colonial Office, sent out for the survey of the Gold Fields, Gold Coast; West Africa. Captain W. M. THOMPSON, R.E., has been sent out with the Chili-Argentine Boundary Commission to South America. Three non-commissioned officers from the Survey are at present employed under the colonial authorities on the survey of Lagos, and one on the survey of St. Vincent.

AMSTERDAM, it appears, enjoys immunity from the destructive effects of lightning. In the memory of the oldest inhabitant not one case of injury to a human being or a house has been known. The people are not satisfied with their happy condition, but wish to discover the reasons for the exemption from the danger. Dr. MORITZ SNELLEN, the director of the De Bildt observatory, has endeavoured to satisfy his countrymen. He says that the immunity is, in the first place, owing to the numerous towers and tall houses which are so carefully provided with conductors that the risks of sudden attacks are removed. He thinks that the character of the flat country which surrounds Amsterdam is also a factor. Credit is likewise given to the telegraphic and telephonic arrangements; for, according to Dr. SNELLEN, it would be possible to utilise those means of communication in such a way that the danger from lightning would be reduced to a minimum. Instead of recognising the extent to which overhead wires stretched from point to point affect the appearance of a city, Dr. SNELLEN would have a network of them. In that way he believes that not the least risk to houses would arise, for the force would be so much diffused as to lose its harmful properties. It is recommended that at present insurance should be made doubly sure by an increase in the number of conductors existing in Amsterdam.

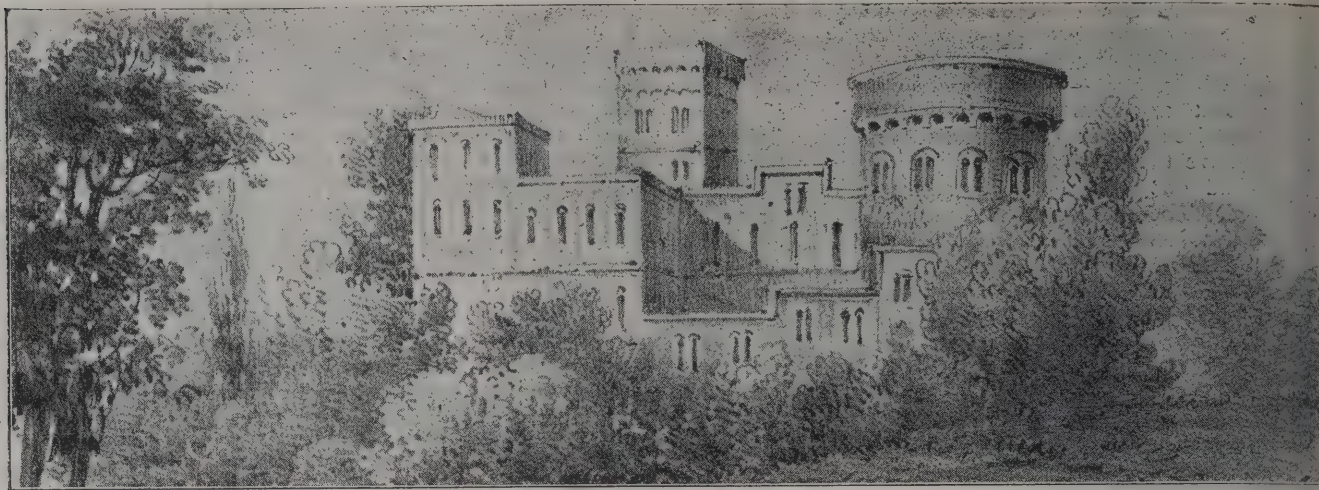
THERE is no country in which more talk is heard about property than in Ireland. On the other hand, there is no country out of India in which the caste system is so strong. The working classes have always striven to keep trades in such a way as to become monopolies for the families of the workmen engaged in them. The endeavour which is now being made to introduce technical education is therefore

handicapped. Ireland is not a manufacturing country, and in many parts of it industries do not exist for which any high degree of technical education is needed. It was stated before a recent inquiry that the only industries which can be regarded as general are those connected with the building trades, and under the special circumstances in which the work was carried on it was unnecessary to provide against demands for higher classes of work, which were never likely to arise. It is accordingly easy to understand why the technical education committee of Limerick passed a resolution that none but sons of tradesmen or operatives, or apprentices to tradesmen, should be admitted to the classes for plumbing and carpentry. It is needless to say much dissatisfaction was aroused by that decision, especially among people who were not connected with the two trades, but wished to see even a remote chance of employment for their sons. A second meeting was held at which it was explained that the Technical Education Department in Dublin would not countenance such a proposal or give their consent to public moneys being expended in a manner contrary to the intention of the Act of Parliament, and which it would be illegal to carry out. It was after discussion agreed that trade representatives should confer with the committee's representatives, with the object of a satisfactory settlement of the dispute. The principle at stake is important, and sooner or later the old system must give way to modern necessities.

CO-OPERATION in this country is mainly exemplified by efforts to dispense with the retailer and other middlemen who contrive to find profit in transactions which take place between the production of an article and its consumption. Labour partnerships have met with little success. Economists have been in a position to show that partnerships of that kind are more rigorous in dealing with labourers and employes who are not members than ordinary manufacturers. In foreign countries and the colonies the experience seems to be otherwise. In France, where M. LECLERE, the house-painter, first made the experiment of establishing his men on a similar footing with himself it is not uncommon to let contracts, especially in building operations, to workmen's associations. The arrangement is facilitated by the custom of having separate contracts for each trade instead of entering into one contract for all trades. The principle is recognised in other classes of work. In Italy building works are likewise carried out by labour societies, and in New Zealand a large amount of work is performed in that way. By the Trade Union Acts speculation with a society's funds is not tolerated. It will therefore be impossible for the experiment about to be tried by the Amalgamated Society of Carpenters and Joiners to be supported out of the Society's funds. It is estimated that 6,000% will be sufficient to start the enterprise. That sum can be raised by a special levy of 6d. a week for four weeks. The amount is not large, and the contracts undertaken must therefore be of limited extent. It will be more difficult to make the experiment successful than in France. The members are not likely to be competent to undertake the work of other trades, and yet it is not easy to see how the letting of work is to be arranged on a new system in order to accommodate their weakness.

THE first instalment has appeared of a large work to be entitled "The Modern Carpenter, Joiner and Cabinet Maker: A Complete Guide to Modern Practice" (The Gresham Publishing Company). It is edited by Mr. G. LISTER SUTCLIFFE, who has supplied an introductory section on architectural styles. The section on woods is by Mr. FRANK TIFFANY. The pages show numerous excellent illustrations, some in colours, and the work promises to supply ample information to all who employ wood. A book of the kind is evidence of the increased interest which is now taken in technical education. It is well fitted for adults who stand in need of information, but have not the courage to attend classes with youths, or opportunities to study in public libraries during the hours they are open. Unless, however, encouragement is given to authors and publishers it cannot be expected that works which are costly to produce can become available on economical terms.





PAINTERS' ARCHITECTURE: GUIDO.

## SCULPTURE IN ST. PAUL'S CATHEDRAL.

WHEN Dr. NEWTON, who was dean of St. Paul's, as well as rector of St. Bride's and bishop of Bristol, died in 1773, he left a sum of 500*l.* for the erection of a monument of himself, and expressed the desire that it should be set up in St. Paul's. The Bishop of London refused. Dr. TERRICK was probably not altogether pleased with the conduct of the dean, who had endeavoured to persuade his lordship into approval of the project of the Royal Academy, by which REYNOLDS, WEST, BARRY, DANCE, CIPRIANI and ANGELICA KAUFFMANN were to be allowed to decorate the walls of the building. Bishop TERRICK declared that he would never suffer the doors of the metropolitan church to be opened to the introduction of Popery, and monumental sculpture was, to his mind, as dangerous as paintings of Biblical scenes. Dr. NEWTON had anticipated that his request would be granted, and his memorial would become the pioneer of many other works of art. At that period the bareness of the walls was beginning to be realised. HORACE WALPOLE wrote:—"The excess of plainness in our cathedral disappoints the spectator after so rich an approach. The late Prince of WALES, I have heard, intended to introduce tombs into it, and to begin with that of his grandfather." But the bishop was obdurate to all appeals.

The exterior of the cathedral was originally adorned with sculpture, and apparently the doctrines of the Church of England were not shaken. FRANCIS BIRD received 650*l.* for the fine relief in the pediment which illustrates the Conversion of St. PAUL. He also produced the statue of St. PAUL on the apex, with the companion figures of St. PETER and St. JAMES. GRINLING GIBBONS executed beautiful carving in the choir. But those precedents were disregarded. It was not until 1785, or twelve years after Dr. NEWTON's death, that a statue of Dr. JOHNSON, by BACON, was allowed to be introduced. Everyone knows it is a half nude figure, but the head bears some resemblance to the sage. Ten years afterwards a second statue by BACON was set up, one of HOWARD the philanthropist. That strange being, who, although he hated his son, went all over Europe in the endeavour to mitigate the lot of prisoners, is represented as trampling on chains and fetters, and holding a large key. It was, therefore, not unreasonable at first sight to conclude that the statue was a figure of St. PETER, and that Dr. JOHNSON was a colossal St. PAUL.

Once sculpture was permitted to gain a position in St. Paul's it was not long before a supply was forthcoming. One of the causes was the war with France. There was a committee of taste in those days, whose duty it was to select subjects. JOHN BACON proposed to spare the members trouble and expense by offering to execute all the national monuments below the sums assigned to them in the Parliamentary estimates. THOMAS BANKS obtained the commission for memorials of Captain BURGESS, who fell at Camperdown, and Captain WESTCOTT, who was killed at the battle of the Nile. In the figures an effort was

made to combine portraiture with Greek idealism. JOHN FLAXMAN was the sculptor of the monument of Lord HOWE, whose deeds the Muse of History is recording. NELSON is shown wearing a pelisse he obtained from the Sultan of TURKEY, while BRITANNIA points him out to the attention of two young sailors. The latter, in an historical sense, was FLAXMAN's most important work. Sir RICHARD WESTMACOTT endeavoured to immortalise several English officers, Sir RALPH ABERCROMBY, Lord COLLINGWOOD and Admiral DUNCAN being among them. ROSSI, who, notwithstanding his Italian name, was a native of Nottingham, produced the statues of Lord HEATHFIELD, Lord RODNEY and Lord CORNWALLIS, Captains MORSE and RIVERS. The excellent statue of Sir JOHN MOORE was by BACON. The fiery PICTON's monument is the work of SEBASTIAN GAHAGAN, who had been an assistant of NOLLEKENS. By THOMAS CAMPBELL, the Edinburgh sculptor, is the figure of Sir WILLIAM HOSTE. CHANTREY is not represented by many works; among them are the statues of General GORE and General SKERRETT.

There is no question that the gratification at the success of English troops imparted an extraordinary impetus to the sculptor's art. About 100,000*l.* is understood to have been spent on the monuments of the heroes. It became plain from the appearance of the figures in St. Paul's that the objections to sculpture in churches were not well founded. Much can be said on both sides of the question. If the dead must be recalled, there are many simpler ways of doing so than by such elaborate nudities as are visible in the cathedral of London. In some cases the subjects of the monuments are not easily made out and the allegorical figures are not always self-evident. But the figures, it must be admitted, although executed without any regard to the architecture of St. Paul's, are of some use in overcoming the coldness of the interior.

Warriors were not the only class allowed to have memorials in the cathedral. One of FLAXMAN's earliest works is the statue of Sir JOSHUA REYNOLDS. The President could not be considered as the friend of the sculptor, for he had given the gold medal to ENGLEHART, although FLAXMAN's relief was superior. He had also announced to the young sculptor, when he heard of his marriage, that FLAXMAN was ruined for an artist. But the statue in St. Paul's bears no traces of dissatisfaction. Instead of a palette, REYNOLDS holds his "Discourses" in his right hand and the left rests on a pedestal bearing a portrait of MICHEL ANGELO. Other representatives of peaceful pursuits are Sir WILLIAM JONES, who, as the founder of the "Asiatic Researches," laid the foundation of the study of those Eastern laws, languages and literatures which to a great extent have revolutionised men's notions of ancient history; Bishop HEBER, who also laboured in India; HENRY HALLAM, the historian of literature; and Dean MILMAN, the historian of the Jews and of Latin Christianity. But no monument in this cathedral can approach that of WELLINGTON by ALFRED STEVENS; indeed, it has not its equal in any English



building. The memorial of Lord LEIGHTON is another example which suggests by its contrast with the early nineteenth-century works that sculpture has advanced in England. But what would Bishop TERRICK say if he could see the reredos? It is very rich, but it is as little in keeping with the general character of the building as some of the monuments.

It is remarkable how little regard was given by WREN to the employment of sculpture as a means of decoration. Only in connection with the altar was there any mention made of the art. From the "Parentalia" we learn that he contemplated the use of mosaic for beautifying the inside of the cupola, and it goes on:—"The painting and gilding of the architecture of the east end of the church over the Communion Table was intended to serve only the present occasion, till such time as materials could have been procured for a magnificent design of an altar consisting of four pillars wreathed of the richest Greek marbles supporting a canopy, hemispherical, with proper decorations of architecture and sculpture, for which the respective drawings and a model were prepared." Specimens of Greek marbles were obtained from a "Levantine merchant in Holland," but the colours and scantlings did not answer WREN's purpose. The architect's indifference to sculpture is the more inexplicable because he was evidently fascinated by BERNINI, who was more of a sculptor than an architect, and whose architecture has sculptural qualities.

If WREN had provided for sculpture, and especially in the form of reliefs, a large part of the building by this time would present a different appearance. Instead of expending 100,000*l.* on the figures of brave men executed in a way that justifies the application of the epithet "Heathen" to them, if the money had been applied to the execution of reliefs the end desired would be attained besides the adornment of the building. The statuary as we now see it might have served for a secular hall of fame or a historic sculpture gallery, but it cannot be looked upon as in any way religious. In WREN's time the art of sculpture, especially in the form of reliefs, was no doubt believed to be at a low level. But the work of BIRN was sufficient to indicate what might be done with proper encouragement. There is no reason why sculpture would not answer at least as well as mosaics, a form of art which is not shown with supreme power in St. Paul's.

### THE MODERN HOMESTEAD.\*

AT the Congress of Public Health which has just been held at Exeter, several of the speakers called attention to farm buildings as a source of general danger. There was a time when the state of those buildings received no consideration except from landlords and tenants. It is now realised how an unhealthy cowhouse or pigstye can affect the health of a district, and it may be one at a remote distance. On the other hand, the question must arise how far respect for sanitary conditions increases the farmer's expenses, and on that matter there is much difference of opinion. It must also be remembered that in our days there are many changes in the processes of farming, and arrangements which are adapted to one system of raising crops may not serve for other kinds of produce. For those reasons the character of farm buildings is a serious subject for the designer, as well as for the farmer. In North America the possibility of revolutionary alterations is recognised by the indifference to the grouping of the buildings, and wood is used in preference to stone or brick, owing to the belief that economy is desirable, and it is well to have structures which can be readily removed in order to make way for others of a different kind which correspond to new conditions.

The qualifications which Mr. HENDERSON possesses for writing on the modern homestead are described as exceptional by the Secretary of the Highland and Agricultural Society of Scotland. We are informed that his "tastes, training and experience have all combined to fit him for such an undertaking. He is familiar with the

numerous types of homesteads to be seen on present-day farms, and has made it his business to study their peculiar features, their weak points and their strong. He has had extensive and varied practical experience both in the erection of new homesteads and in the repairing and remodelling of old." It is not easy to see what else is required to constitute a writer on the subject. All through the pages we perceive a recognition of practical needs. The book is not intended for those who would play at farming. The author says there are plenty of instructors who have more of the fluency of the ready writer than the wit of the man of experience; but more stone than bread is usually found in their baskets. He at least does not belong to that class.

It is curious what influence is exercised by little things, or those which seem to be such to amateurs, in determining the character of farm buildings. If the reaping machine had more resembled the Australian stripper, barn buildings could be diminished in size. A donkey-engine would also serve and less granary accommodation be demanded. The immense amount of straw, however, which is unavoidable at present, involves expense which is out of proportion to its value. Farm buildings, it should be understood, form a factory in which materials that are nearly superfluous have to be dealt with, being unlike most other factories which allow of a large amount of preliminary preparation to be gone through in other places, and it may be in a distant country. When the farmer remembers how vast a part of his operations do not pay if considered by themselves, he is not to be blamed if he grudges every pound expended on the appearance of buildings. The system advocated by Mr. HENDERSON will be evident from the following extract:

There is no necessity for spending more money in the erection of the homestead than is absolutely needful. We do not, however, advocate the pushing of economy to the verge of ugliness in all that pertains to the steadings. The buildings may be plain and serviceable, and yet not altogether objectionable from an artistic point of view. Neither, on the other hand, would we sacrifice utility and economy for the sake of appearance. A little money judiciously spent will take away the bareness, if nothing else, from the harshest place of the kind. But first of all let us arrange the houses in such a manner that each one separately, and as a part of the whole group, will serve its end at the least outlay of labour. Following on this we have to make sure that the animals proposed to be confined within the buildings will have the opportunity of being comfortable as well as healthy. Then we must see to their erection for the least amount of money without sacrificing either efficiency or permanency. After that, or at any rate after the probable cost of that has been arrived at, comes in what those who control the purse are willing to spend gratuitously in improving the appearance of the countryside, or at least toning down somewhat the too frequent ugliness of these excrescences on the landscape.

The last words reveal the idea which has inspired a good many architects' plans which have not met with approval from farmers. In the majority of cases farm buildings do not enhance the beauty of landscapes. This is shown by the difficulty of painters in discovering picturesque examples. They are obliged to depict them in their stern utilitarianism, but try to make them presentable by indicating their age or their loneliness, or in other ways to express that "pathetic fallacy" which is supposed to be associated with everything connected with agriculture. But the dissatisfaction is no new one. At the end of the eighteenth century we find JOHN CARTER, the champion of Gothic, preparing a design which was to overcome the irregular, injudicious and disagreeable objects by showing how farm buildings could be arranged in a grand though simple and uniform manner. Accordingly in his plan curved lines prevail; the house is approached by a curved arcade, the farmer's house is square, but the dairy and the pantry flanking it are semicircles. The wood-house, the pigsties and poultry-houses are all laid out as semicircles, and the cow-house is segmental. So much roundness would probably be agreeable to the eye, but there is no evidence to show that the design was ever carried out. It is difficult to convince a farmer of the connection between the line of beauty and increased productiveness.

The titles of the chapters will suggest the subjects which are comprised in Mr. HENDERSON's exhaustive work. It deals with the essentials of a good homestead,

\* *The Modern Homestead: its Arrangement and Construction.* By Richard Henderson. (London: The Country Gentlemen's Association, Ltd.)



walls, roofs, their framework and covering, floors and drains, doors, windows and ventilators, sanitation, water supply, power, the barn range, buildings west of the barn, buildings east of the barn, dairy buildings, pig-house and dungstead, cattle court, hay and sheaf sheds and the sheep "fanks" or mustering place. As there are 273 diagrams the descriptions are always to be understood. The author throughout supposes that he is appealing to tyros, amateurs or designers who may not have had experience with farm buildings, and acts on the principle that information cannot be too detailed to be explicit. The use of the volume is therefore not confined to England, for it would be a valuable endowment for farmers, who are mostly novices, who have decided to seek their fortunes in the colonies. Architects who are in cities pent have neither time nor opportunity to master all the requirements of buildings which are demanded when they have to be turned to agricultural

purposes. In Mr. HENDERSON's book those architects will find unadorned examples; they can convert them if clients are favourable into more ornamental structures, but, unless we are mistaken, there is little need to deviate from the arrangements. Economy and efficiency are mainly sought after by the author, and it is only in exceptional cases that any other quality will be desired by farmers.

#### THE DUCAL PALACE, NANCY.

IN Nancy is a large equestrian statue of JOAN OF ARC, who is represented as looking towards Germany and seems ready to lead an army in that direction. But with no less reason the position of the figure could be reversed. JOAN OF ARC, as a native of Domremy, was not a Frenchwoman, but a subject of the Duke of LORRAINE, whose





capital was Nancy. Many attempts were made during centuries to unite Lorraine with France, but that end was not fully accomplished until 1766. For a long time Lorraine might be considered as having acted as a buffer State. The Dukes of BURGUNDY looked on themselves as no less powerful than the Kings of FRANCE, and in the wars between the mighty opposites Lorraine repeatedly suffered. CHARLES LE TÊMÉRAIRE seized on Lorraine, and in 1473 sought to have himself recognised as a king instead of a duke. A league was formed against him. The duke, considering his forces inadequate against so many enemies, prevailed on the English monarch, EDWARD IV., to lend him his aid, and in 1475 a large army landed at Calais. LOUIS XI., the French king, however, was able to purchase immunity, and the peace was long known as "La Trêve Marchand." The same year CHARLES LE TÊMÉRAIRE entered Nancy as conqueror. Two years afterwards the duke was defeated under the walls of the city which he had destined for his capital. He was slain by an enemy who did not claim any distinction for the deed, and his corpse was mutilated.

It suggests a peculiarity of the time that immediately after the war Duc RÉNÉ II., the Lorrainer, commenced a new palace in Nancy on the site of one which had been built by Duc RAOUL, and was devastated. The works took several years to accomplish, and the grand entrance, of which we give an illustration, was not completed until 1512 by Duc ANTOINE. His successor, CHARLES III., added a *salle d'honneur*. He also enriched the palace with many masterpieces of art. On his death there were remarkable funeral ceremonies, of which engravings were prepared. They enable us to judge of the exterior as well as the interior of the palace at that period. They were the only documents employed for guidance during the restorations which took place in the nineteenth century. We need not closely follow the history of Nancy. It was conquered by LOUIS XIII. in 1633, and he retained possession of it for four years. The palace was occupied by a French governor, when the building was neglected. In 1641 the Frenchmen left the city, but in 1659 there was another attack, and the palace was pillaged. LOUIS XIV. stopped for a time at Nancy, and he considered the palace in which he resided as more commodious than the Louvre. Duke LEOPOLD, of Lorraine, preferred to live at Lunéville, and a part of the ducal residence was demolished in order to supply stones. After a time His Highness imagined the old palace could be improved. He added a second storey to a part where there was only one. Then he removed some of the most interesting features, and at length he grew tired of his meddling and left the building incomplete.

Nancy owes many of its characteristics, such as its triumphal arches, its beautiful wrought-iron gateways and balconies, to the Polish king STANISLAS LESCZYNSKI, who had married a princess of Lorraine, and became duke after his abdication of the throne of Poland in 1735. By his liberality Nancy rose to be one of the most interesting of modern cities, but he was indifferent to the ancient abode of the dukes. He made it over to the Municipality on the condition that it should be used as Government offices. It was found to be inconvenient for that purpose, and a series of transformations and demolitions began. The *Salle des Cerfs* in which the States used to assemble was changed into a public granary, with stables on the ground floor. But the eighteenth century had not closed when the Revolution broke out. The fanatical volunteers from Marseilles passed through Nancy. Regarding the palace as a representative of feudalism and royalty, they expressed their rage by the mutilation of the sculpture, and the great entrance which so many restorers had respected was the principal victim. For years the palace was allowed to fall into ruin. When more peaceful times arrived it was decided to make arrangements for the conversion of the remains into a prefecture. The Municipality of Nancy, however, claimed the liberty to employ the *Salle des Cerfs* for a picture gallery and museum. Their demand was in course of time agreed to.

Unfortunately, a fire occurred in August 1871, which added to the grief of the inhabitants who had seen their city occupied by German troops. The *Salle des Cerfs* was over-arched with wooden vaulting, above which was a massive framing to support the roof. The roof was one of the first parts to take fire, and the valuable collections of antiquities

relating to Lorraine which were kept on the first floor were consumed. The tapestries alone were rescued. At the two ends of the musée were rich Renaissance chimney-pieces, which were in a great measure destroyed. All the masonry of cut stones was reduced to powder, but it was observed that some rubble of an ordinary kind was, owing to its great thickness, able to resist the flames. The part on the ground floor in consequence of the masonry vaulting escaped to some extent, and various objects of art which were placed there are still to be seen.

At such a time the people were not in a condition to contribute largely. The restoration was in consequence of only a partial character, and the visitor now finds some difficulty in realising the extent of the original palace. What was executed was, as we have said, based upon the engravings which were prepared as records of the funeral ceremonies of 1608. As their accuracy was remarkable, there are grounds for accepting the modern restoration as having some claim to authenticity. The entrance especially appears to correspond with the ancient representations, and is accepted as the most characteristic part of the palace.

### THE CHURCHES OF CLEY AND BLAKENEY.

THE Norfolk and Norwich Archaeological Society recently visited some of the quaint old-world villages which fringe the bleak northern coast line, including Cley and Blakeney.

The Cley of the present day, says the *Norwich Mercury*, is but the shadow of its former greatness, but its undisturbed quiet and wide variety of scenery are evidently an attraction for a great many holiday-makers, for the village just now presents quite an air of bustle and importance. Arrived at the church, which has also shared in the general decay, and is but the ghost of the magnificent structure it was evidently intended it should be, Dr. Bensly read a few notes upon its architectural characteristics. It was difficult, he pointed out, to fix precisely the date of the structure, but the earliest work traceable pointed to some considerable time prior to the thirteenth century. The lower portion of the tower appeared to be the oldest part of the fabric, and then in succession the chancel, nave and aisles were taken in hand. The transepts were also begun but never completed, for the ravages of the Black Death, here as elsewhere, put an end to all church building. In their ruined state, weather-worn and time-stained, these remain incomplete to the present day. The extent of the work which was once planned told of a large and prosperous community in those remote days, whereas now quite five centuries and a half after the plague the whole population scarce suffices to fill the church. At the present day the north aisle is completely boarded up, and even of the remaining space only a small part is screened off for purposes of worship. A priest's chamber over the south porch, till within recent years exposed to the elements, has been suitably roofed over. Locally it seems to be known, for some mysterious reason, as the "old maids' chamber. Among its curious contents is a massive iron-bound chest, which must have been built where it stands, for it would be impossible to get it out of the chamber by the only means of ingress, the narrow turret staircase. In the churchyard one noted tomb records the burial-place of Capt. James Greeve, who, in one of Cloudesley Shovel's maritime enterprises, helped "in burning ye ships in ye port of Tripoly, in Barbari, January 14, 1675-76, and for his good service performed was made captain of ship called the *Orange Tree of Algier* in 1677, and presented with a medal of gold by King Charles ye 2. He died April 14, 1686, aged 48 years."

Blakeney, where, as the popular rhyme goes, "the people stand on the steeple and crack hazel nuts with a five-farthing beetle," was the next object of research. Mr. J. Oldrid Scott, a resident, and evidently an enthusiast on the lore of the locality, kindly undertook the office of guide to the beauties of this extraordinary fine church. Dedicated to St. Nicholas, the patron saint of mariners, this noble building serves a doubly useful purpose, inasmuch as at its north-east angle is a second tower, in miniature, designated the lighthouse tower, and built and utilised for the very purpose of guiding the home-coming mariner along the treacherous stretch of water that lies between the sea and the once busy harbour of Blakeney. The two towers certainly are a most conspicuous feature in the landscape. Mr. Scott said the architectural history of the church is very simple, for only two styles are represented, the beautiful brick groined chancel dating from the middle of the thirteenth century, and the very noble nave from the fifteenth. Why it became necessary to rebuild the Early English nave only some 200 years after its erection cannot now be determined, but it is very probable that it was burnt down, though there is no direct evidence of this. The traces of the older nave are very slight—two of the Early English columns were placed against the eastern jambs of the



two eastern windows of the north aisle, no doubt to carry figures connected with chapels. There is part of an Early English corbel inserted over the doorway which led to the rood-loft, and it seems very possible that the stones of the inner order of the beautiful nave arcade once formed a part of the corresponding early arcade. Of the nave and tower little has to be said. They are of most admirable design, while all the details are refined and appropriate to their general position. The proportions of the interior are entirely satisfactory. The roofs, though not so rich as many in the eastern counties, are very pleasing, and one is glad to see how carefully they have been restored. The only old benches are the very simple ones in the south aisle. The font deserves especial attention. The lower part is adorned with shields bearing emblems of the Passion. Mr. Scott said one of them was a puzzle to him for some time, when he discovered that it was the sword with which St. Peter cut off Malchus's ear. The ear is shown sticking to the blade. There are two shields carved on the plinth of the tower buttresses, one of which bears the arms of the see of Norwich—three mitres labelled, the lower one transfixing with a crozier in pale. The other shield bears a dolphin embowered with a cross above it on an escutcheon, all within a bordure charged with escallops. This shield has probably to do with St. Nicholas, the patron of the church, and of fishermen in general. Inside the tower there is a small niche on the north side. Six holes are cut in its floor. They were probably used to hold the candles of those attending funerals. The north porch is a somewhat later addition. The few remains of stained glass collected in one of the aisle windows deserve attention. The chancel requires careful examination. It is groined in two square bays. The western bay has two similar windows on each side. These have had later tracery inserted for some reason which is not apparent. The old windows consisted of three lancets each, as may be seen outside, on the south side, where the original sill was left when the later window was inserted above the sedilia. The three lancets correspond in width with the two outer ones in the seven-light east window. Above the chancel groining there is a chamber approached by the turret, which is continued upwards and forms the lighthouse tower. In the west wall of the chamber there is an Early English doorway which must have opened into the church above the chancel arch. It may have been used for reading the Gospel from till the later rood-loft was erected. When this was done the door ceased to be of any further use, and it was blocked up by the rood, the beam for which still remains, and is now occupied by the rather handsome frames containing the Commandments, &c. The church is one which no one who has had the good fortune to visit it will easily forget. Its noble western tower and its unique lighthouse turret, its grand nave, with a tower arch hard to match in any other church, its lovely groined chancel with the rare feature of an east window consisting of seven lancets, make up a whole which gives to Blakeney Church a distinction hardly to be met with anywhere else.

Before leaving the place, a quaint pebble and brick built structure, overlooking the harbour, was examined and proved to be the crypt of a guildhall that the town once boasted. It, too, had its subterranean passage, now blocked up. The groined roof of the crypt is still in fair preservation.

### TESSERÆ.

#### Choirs in Churches.

THE form which choirs have assumed in England and in Northern Europe is well known. At Milan, where the Ambrosian rite still prevails, the choir is raised some steps above a "confessione," and is surrounded by stalls, while two ambones, considerably elevated and of most beautiful form, stand at the extreme ends of the choir seats, close to the nave. At Rome, and in some places in Tuscany, the choir is in its primitive position before the altar. In many other places it is behind the altar in a sort of lady chapel; in others, and by far the greater number, it is in a separate side chapel, sacristy or chapter-house. The main difference in the North of Europe is the position of the cancelli or rails. They formerly separated the altar from the choir, now they separate the choir from the nave. The idea that the laity should never enter the chancel or choir has always been a puzzle to antiquaries. The practice of going to the high altar is so often named, it has also seemed so difficult to believe when we see such a choir as that at Canterbury, raised up so many steps and enclosed by such a massive screen and such high walls, how a service was celebrated at which the laity were called on "to draw nigh," and where they could neither draw nigh, nor see, nor hear. But there is the positive testimony of Barclay in the "Shippe of Fooles," which shows that the laity were not only admitted to the church, but also the choir or quere. The second part of the homily "On the right use of Churches" says, "They never cease their uncomely walking and jetting up and down and

overthwart the church; and speak covetously and ungodly, scarce honest or fit for tavern or alehouse, in the house of the Lord." Besides this, we have the well-known custom in France and Belgium, as well as in our own cathedrals to the present day, that the laity are and always have been admitted freely into the choirs. In the different towns in Italy the laity, men and women, entered what we should call the different chancels when mass was said and took their seats in the stalls, or wherever was most convenient. The word chancel is never applied to any portion of the building, but only to the gates, and railings, "cancelli," which separate the various chapels from the other parts of the church; that what we call the choir is by them called by its primitive name tribune—the ancient bema—and that the "coro" or quire is in any place, side chapel or otherwise, where it may be conveniently held, and, besides this, that it is shifted from place to place at different times according to weather, and not only so but that in most cases it ceases to be called the choir when the choir or monks who form the choir and who sing the breviary services have left it. But still, and here seems the point whence all these errors have arisen, while it is a choir—that is, while the breviary or choir services are going on—the gates or "cancelli" are carefully closed; sometimes curtains are drawn before them, and the laity are always rigidly excluded. A still more striking instance is found in the Jesuit churches, which are all built without chancels or choirs. Ignatius Loyola found the system of assembling every three hours for short services so interfered with the life of active exertion which he required from all his followers that this obligation is omitted in his constitutions, and as thereby choirs would have been useless they are never erected in Jesuit churches.

#### Greek Painting.

Plutarch tells us that Euphranor painted the engagement of the cavalry at the battle of Mantinea as if he had been inspired. The painter had never merited such singular praise, had he not wrought his subject to the nearest semblance to truth, and that this could not have been without a particular attention to the disposition, the same writer proves in another instance when, speaking of the battle fought by Arastus against the Etolians, he adds that Timanthes the painter brought this action, as it were, before the eyes of the beholders by the evidence of his disposition. Thus it is plain that the inspiration of Euphranor and the evidence of Timanthes flowed from the same excellence, an union of the two kinds of disposition, the expressive and the picturesque. "The drama of painting."—It was with great propriety so termed by the ancients, because, like a dramatic poem, a picture contains, first, a subject or fable; secondly, its order or contrivance; thirdly, characters or the manners; fourthly, the various passions which spring from those characters. Philostratus, speaking of the composition of a picture, calls it in express terms the drama of the painter; Pliny has the same idea to his commendation of Nichophanes. But we shall be better satisfied of the justness of this application by examples than by authorities. It was the opinion of Nicias, one of the greatest of Greek painters, that the subject was of no less consequence in painting than the fable in poetry, and, of course, that great and noble actions tended to elevate and enlarge as the contrary must humble and contract the genius of the painter. The ancients had great advantages in this particular; they had not only their profane history, rich in the most glorious and interesting events; but their sacred, whilst it furnished them with new ideas of the sublime, gave no check to the pathetic. Their gods, superior in grace, majesty and beauty, were yet subject to all the feelings and passions of humanity.

#### Indo-European Building.

History does not inform us of the condition of the parent people from which it is assumed the Indo-European nations have sprung. But knowledge of this kind would be very useful, indeed is indispensable, to enable us to exercise a critical judgment upon the obscure events which constitute the only historical evidence which can be brought forward to support the presumed migrations of races. We must accordingly seek for this information in some other quarter, or rather in the only one to which we could look—an examination and comparison of all the words expressing family relations, government, cultivation, &c., now existing in the Indo-European languages. The chief occupation of the parent Indo-Europeans was the herding of cattle, as is proved by the number of words, especially in Sanscrit, which appear to have originated in pastoral habits. Great wealth was connected with the possession of cows, and the vedas are full of allusions to the ancient pastoral life. At an early period, too, there must have been considerable associations of people among the parent race, because in addition to the word "vic," denoting a place, we find already in the vedas the word "grāma" for village, and the word "pur," or in the later form, "puri," for city. Now the word "vic" is probably the root of the Latin "vicus," village, and of the great number of derivatives which have



been formed from it, while the Greek "polis" = city, corresponds exactly with "puri." They also had regular houses. In Sanscrit, "dama"; Gr., "doma"; Lat., "domus"; Rus., "domi." According to Grimm the Gothic word "timrjan," to build, contains it, being related to "demein" (Ion. pro "oikodomein") to build a house. A similar correspondence may be observed between the parts of a house; thus, for example, "door"—Sanscrit, "dvār," fem., "dvāra"; Old Persian, "dhuwara"; Kurd, "deri"; Armenian, "durhn"; Gothic, "daur"; Gothic of the Crimea, "thurn"; old high German and old Saxon, "dor"; Lett. "durwis" ("durris"); Lithuanian, "durrys"; Rus., "dver," plural, "dveri"; Greek (plural), "thura."

### Stothard's "Wellington Shield."

The Wellington Shield was the work in which the genius and art of Stothard were most remarkably displayed. This testimonial was subscribed for by the bankers and merchants of London, the competition being made open to the silversmiths, whose designs were to be approved by the committee. Stothard was applied to by every house which competed. He gave the preference to Ward & Green, who were till then strangers to him. He had only three weeks to the day fixed for receiving the designs. The first thing he did was to read and make extracts from the histories and despatches of the war. The Shield of Achilles, by Flaxman, which he greatly admired, he took as the basis of his design, and imitated it in planning a series of compartments with separate subjects. Commencing with the battle of Assaye, he depicted scenes from all the great victories of the European war. In the centre the duke is represented on horseback, surrounded by the chief officers of his army. The management of the horses in this group is much admired. The designs were done in sepia, and on being examined by the committee were selected unanimously, although some distinguished artists were among the competitors. It is stated that Westall received from the same house (Ward & Green) 500*l.* for his unsuccessful designs. After the designs were approved, difficulty was experienced in getting the models executed, the artist employed having died before commencing the work. Stothard volunteered to prepare the models, although this was a kind of work which he had never attempted. He did not even know the usual mode of procedure, but taking a camel's-hair pencil, he laid on the soft clay after his own ideas. His attempt was entirely successful, and sculptors who saw the models pronounced them admirable. He had far more difficulty when the chasing in silver began to be executed. Repeatedly did he complain of the sad want of knowledge of effect and deficiency in drawing among chasers of silver, who ought to cultivate the art of drawing in order to enable themselves to execute well the practical parts of their own art. He said also that so great was their self-conceit that while teaching them by instruction and criticism, accompanying his remarks with delineating what he wanted them to understand, instead of attending to him, they would turn aside their heads with the most careless indifference, so that at the last he saw the task completed in its chasing with anything but satisfaction. This led him to resolve to make etchings of the designs, the same size as the originals. Of engraving he was also practically ignorant. In this, however, he was also successful, so much so that Heath, who accidentally heard from the copperplate manufacturer what Stothard was about, on seeing the plates, expressed his wonder and admiration. The engravings are now very valuable. With the designs of the shield the Duke of Wellington was highly pleased, and the reputation Stothard obtained by the work procured for him much advantageous employment.

### B. E. Murillo.

The influence of the style of Vandyke upon Murillo, produced by the intimacy of the latter with Pedro de Moya, a pupil of the great Flemish painter, seems to have mainly engendered in him that earnest desire to inspect the originals which made him contemplate visiting England, and which actually led him to the capital of Spain. Here his reception by and intercourse with the great Velasquez forms almost the only important epoch of his life, and no circumstance of his existence so forcibly arrests the imagination or so well deserves the efforts of commemorative art as the introduction of that young, eager and uninformed genius to the treasures of the royal galleries, under the guidance of the splendid and courtly officer of Philip IV., himself a master in art and noble in every sense in which humanity can be dignified. It was not till the return of Murillo to his native town, where the remainder of his life was spent, that his own peculiar genius worked itself free from the influences of Titian, Vandyke, Ribera and Velasquez, and became itself a leading star in the art firmament. The narrative of his life from this period is a simple record of an existence in which neither idleness nor weariness found a place. In a city peopled with monks, with picturesque mendicants and enthusiastic devotees—in a city

filled with mysterious churches—lit up, as La Fontaine would say, by the eyes of Andalusian beauties, Murillo passed his time in copying the inhabitants of earth and inventing those of heaven. His whole world was summed up in the city of Seville. On the road which he had to traverse from the parish of Santa Cruz, in which he resided, to the cathedral of Seville, or else to the convent of the Capuchins outside the walls, he lost nothing that occurred to attract his notice. If he met the licentiates Alonzo Herrera and Juan Lopez y Talavan he was struck with their fine heads, and he introduced them under the names of St. Leander and of St. Isidore into some devotional picture. Without the necessity of travelling or of crossing the seas he could handle a thousand different subjects and paint in every branch of the art—landscapes, flowers, sea-pieces, portraits, history and miracles; miserable humanity cowering on the pavement and beatified mortals wafted through the regions of Paradise.

### Florentine and Doric Architecture.

The Florentine is the Doric style of modern palatial or domestic architecture. Admitting of little apparent ornament, but any degree of real richness—genuine, polite, full of thought for the spectator, with no display, no obtrusive art, always more artless the more it is studied, and artificial, always appearing to contain less work, both mental and manual, than it really contains—this style even in the smallest buildings delights the cultured eye by its truly Grecian refinement, yet awes, on the great scale, by a sublimity that only the Doric temple ever surpassed. This quality arises from the leading principles being perfectly Dorian—severe contrast in principal forms (which indeed are more exclusively rectangular than those of the Doric order itself); strict subordination of the lighter classes of form; powerful masses self-poised, without corbelling, without arching; breadth of everything, of light, of shade, of ornament, of plain wall; depth of recess in the openings, of perspective in the whole mass, of projection in the cornice. To these we must add another attribute, not much observable in the Doric (nor perhaps any temple architecture), and remarkably deficient in the other modern schools. This is a sort of utilitarianism, or absence of features useless to convenience or stability; an absence of sacrifice to architecture proper—i.e. sacrifice of material—but abundant sacrifice thereto of thought; and of manual labour, an amount quite optional, this (like all real styles) admitting of great plainness or very florid enrichment. On the whole, the Florentine may be called the common-sense school, and its importation into this country by Barry is a benefit that should atone perhaps for many failures.

### Tibetan Monasteries.

The chief city of Western Tibet is Le. The principal monasteries in the neighbourhood are at some distance from the town in the vicinity of villages both up and down the Indus; but religious edifices, of the many kinds which are everywhere so common in Tibet, are seen all round Le in great numbers. Along the road by which the town is approached there is a very long building, of the kind called Mane, extending for more than half a mile. It consists of two parallel walls, 12 to 15 feet apart and nearly 6 feet high, the intervals between which are filled up with stones and rubbish and the whole covered with a sloping roof, which rises at a gentle angle to the central ridge, midway between the two walls. On the roof are laid large slabs of slate, every one of which is covered with Tibetan letters, or more rarely with a rude drawing of a temple. The words on these stones are a repetition of the mystica Buddhist prayer, from one of the words of which these curious and apparently useless erections take their name. The Mane seems one of the most indispensable accompaniments of a Tibetan village, and they may occasionally be seen even in desert tracts; so that the amount of labour which has been expended in their construction must have been very great, some of the largest containing many millions of repetitions of the words "Om Mane Padme Hom." In the smaller villages they are often very inferior in size, sometimes not more than 20 or 30 feet in length and 3 feet high. Every traveller has constant occasion to notice that in passing these walls the Tibetans always leave them on the right hand, considering it both wrong and unlucky to do otherwise; those proceeding in contrary directions therefore take opposite sides. Equally conspicuous in the environs of Le are the urn-like buildings called Chokten or Chosten, which are erected over the ashes of lamas, or priests, and are therefore in a country where a third or fourth part of the male population adopt a monastic life particularly abundant. Long rows of these, consisting of twenty or more urns of various sizes, may often be seen in conspicuous places above the villages, forming, from the brilliant whitewash with which they are covered when new, very prominent objects. Many of those near Le are of large size and ornamented with rude paintings of dragons and other mythological animals of uncouth form.



## NOTES AND COMMENTS.

TRADE has its victories as well as war. One has just been gained which can be credited to English enterprise. An immense memorial of MOLTKE is about to be executed, and it was decided to employ Pentelic marble. The order was given to the English company who are now working the Athenian quarries. They have been able to obtain a block which measures 32 cubic metres, weighing about 100 tons (German). There has been some difficulty in transporting the block. It was necessary to construct a special waggon to bring it to the Piræus, but the mass is beyond the capacity of any of the vessels trading to that harbour. The English company also supplied the block for the statue of the late Empress FREDERICK, which has been erected in Berlin. When it is remembered that Germany is, next to Russia, looked up to as the most powerful country by the Greeks, and that for many years German archaeologists have been recognised as the first authorities on all questions relating to ancient art, it becomes more noteworthy that recourse should be had to an English company for a supply of marble resembling that which was so much used in Greece.

THE report of the Labour Department of the Board of Trade on changes in rates of wages in 1901 has been published. In the introduction Mr. H. LLEWELLYN SMITH mentions that for the first time since 1895 a decline of wages has to be recorded. It was found that about 430,000 workpeople received advances during the year amounting to 41,000*l.* per week, while 493,000 sustained decreases amounting to 118,000*l.* per week. The net weekly decrease for 1901 was accordingly 77,000*l.*, which compares with increases of 209,000*l.* in 1900 and of 91,000*l.* in 1899. The decline is accounted for mainly by the fall in miners' wages. The metal, engineering and shipbuilding groups of industries had also to accept reductions, the average net reduction being 4*s.* 1*d.* per head. The building trades appear to have been fortunate. The statistics show that 39,687 workpeople received an increase amounting to 1,943*l.*, or 11½*d.* per head. With 4,499 building workmen there was an aggregate reduction of 3,719 hours per week, or an average of 0·83 per head. On the whole it may, therefore, be regarded there were but slight changes in the building trade, and that was more satisfactory than any remarkable reduction.

REMBRANDT, after remaining three years with the painter, JACOB VAN SWANENBURCH, became the pupil of PIETER LASTMAN, who then possessed some renown. The poet, JOOST VAN DEN VONDEL, testified in verse to a remarkable picture by LASTMAN which dealt with the scene when St. PAUL and St. BARNABAS were assumed in Lystra to be JUPITER and MERCURY, because they had healed a man who was lame. The scene was also used by RAPHAEL in one of the cartoons. LASTMAN'S painting, which was executed in 1614, has long disappeared, and was thought to have been destroyed. It has, however, been discovered by Dr. ABRAHAM BREDIUS, who was connected with the State Museum at Amsterdam, and is now Director of The Hague Gallery. He found it in the collection of Count STETSKY in St. Petersburg, and its condition testifies that VONDEL did not exaggerate when he spoke of the colour and power of the painting. Permission has been given for its exhibition at The Hague.

THE palace of the Luxembourg is one of the buildings which was associated with the triumphs of the first NAPOLEON. In 1797 the Directory gave him a reception in it when he returned to France with the treaty of Campo Formio. It was at the Luxembourg that he planned his *coup d'état* of the 18th Brumaire. In 1801 the building was used as the palace of the Senate, and in 1806 fifty-four flags captured from the enemy were deposited there. Afterwards there was a fête and banquet, at which representatives of the Grande Armée were present. It was fitting that a commission should be given for an immense painting to be placed in the building, and which was to commemorate the Triumph of NAPOLEON. The antique style was then in vogue, and JEAN BAPTISTE REGNAULT, to whom the commission was accorded, showed the sovereign as a Roman emperor seated on a triumphal car, and surrounded by figures of Victory, Concord, Peace and Wisdom.

But in 1814 the power of NAPOLEON waned. The controller of the Luxembourg was SEMONVILLE, and he lost no time in becoming a Royalist and in transforming the hall of the Senate in order that it might be worthy to receive LOUIS XVIII. All the symbols of Napoleonism were whitewashed or removed. From a large bust of the emperor the head was taken off, and a label was placed on the part remaining to announce that it was a bust of NERO which was in the process of restoration. The immense picture of the Triumph could not be treated in the same way. SEMONVILLE was therefore compelled to give an order to a painter to substitute the face of the king for that of NAPOLEON. The emperor, however, unexpectedly returned from Elba. SEMONVILLE fled, and the architect in charge of the palace had the visage of NAPOLEON restored. After the Hundred Days the king came back and SEMONVILLE was once more in power, but he had been taught to realise how insecure was sovereignty in France, and REGNAULT received 400*l.* to paint out the figure of NAPOLEON and to substitute one of a woman typifying France.

## ILLUSTRATIONS.

NEW ROYAL INSURANCE COMPANY'S OFFICES, BRIGHTON.

THE Royal Insurance Company of Liverpool and London, having purchased an important corner site in the main thoroughfare of Brighton, have instructed Messrs. CLAYTON & BLACK to design and erect a commanding block of buildings for their south-country branch. The illustration published in this issue shows the intended structure, which will be largely of grey Aberdeen granite, with terra-cotta for parts of the upper storeys. Besides the accommodation for the company in this Royal Insurance building, chambers are provided and offices for auctioneers and others. The cost, including the site, will be nearly 30,000*l.*

LLOYD'S BUILDING, FENCHURCH STREET, E.C. STAIRCASE MIDDLE. LUNCHEON-ROOM.

THIS building has been erected for Lloyd's Register of British and Foreign Shipping. It is situated in and forms an important architectural improvement in Fenchurch Street and the new street which has been called Lloyd's Avenue. The whole of the two elevations is faced with Portland stone, and the fine sculptured work has been carried out from the designs of Mr. G. FRAMPTON, A.R.A., and the ornamental carving by Mr. TAYLERSON. The board-room is 47 feet by 28 feet, and has an elliptical ceiling carried by marble columns, between which is inlaid mahogany panelling. The ceiling was decorated by Mr. GERALD MOIRA. Over the principal fireplace is a large marble-sculptured panel by Mr. PEGRAM. The staircase and entrance-hall has been lined with very beautiful Devonshire marbles supplied by Messrs. JENKINS & SONS, of Torquay, and by Messrs. BURKE. On the first floor of the staircase is to be seen a remarkable bronze and ivory frieze designed and executed by Mr. F. LYNN JENKINS. The panelling in the committee-room is English oak, and that in the library is African mahogany with inlaid ornament. The fine specimens of ornamental plasterwork have been carried out by Messrs. JACKSON & SONS, of Rathbone Place, W. The contractors were Messrs. JOHN MOWLEM & Co., and the whole of the work has been carried out from the designs and under the superintendence of the architect, Mr. T. E. COLLCUTT, F.R.I.B.A., of 36 Bloomsbury Square, London, W. Views of the exterior appeared in our issues of July 25, August 1 and August 15, and interior views on August 22 and 29.

PROPOSED BANK, HOVE, BRIGHTON.

THE building illustrated was designed to occupy a unique site in Church Road, Hove, but an arrangement having been made with the Hove Corporation the road will now be widened and the building will not be erected, its place being taken by a new road across the Vallance Estate to the sea. Messrs. CLAYTON & BLACK, of Brighton, the surveyors to the estate, are the architects.

CONGREGATIONAL CHAPEL, SWANLEY JUNCTION, KENT.

CATHEDRAL SERIES, HEREFORD: EAST END OF SOUTH CHORIS AISLE. THE HIGH ALTAR.



## STROOD, COOLING AND CLIFFE.\*

CONTINUING our pilgrimage along the Roman Watling Street (Vitellina Strata) from Greenhithe and Gravesend, through Chalk and Milton, we come to Rochester, Chatham and Strood; these may be described as a sort of miniature London, Westminster and Southwark. They are all situated on the banks of the Medway, and formed the Roman half-way station between London and Canterbury, being about thirty miles from either. The Romans adopted the principle of extra-mural interments, and Strood was the Roman burial-place for this district. Some years ago the site of a Roman cemetery was discovered near the Temple Farm, Strood, when upwards of 700 coins of Antoninus, Claudius and Nero were found, and among them were a few specimens of Carausius, very rare, and a silver denarius (the Roman penny). Strood, or Stroud, is called in the Textus Roffensis, Strodes, and is described in Hasted as Stroud alias Temple; the church is dedicated to St. Nicholas; it was formerly a chapel to the parish church of Frindsbury. It is not valued in the King's books. Frindsbury, with its appendages Æslingham, Bromhay, &c., was given to the church of Rochester at different times during the Saxon Heptarchy. Offa, king of the Mercians, in 764 gave twenty ploughlands in Æslingham, lying on the western side of the Medway, to Eardwulf, Bishop of Rochester. About the same time King Sigered, of Kent, confirmed the above grant.

These estates had been wrested from the church of Rochester in the troublous times which soon after followed by reason of the Danish wars. They came afterwards into the possession of King Harold, and on the accession of William I., were given by him, among other estates, to Odo, Bishop of Baieux, his half-brother; but Archbishop Lanfranc recovered them again in 1076, and afterwards restored them to Bishop Gundulph. Frindsbury is described in Domesday Book as Frandesberie. The village joins the north side of the town of Strood, forming one of its streets, through which the high road lies from thence to Cliffe and the Hundred of Hoo.

Frindsbury Church is dedicated to All Saints. At the time of Bishop Gundulph coming to the See of Rochester in the reign of the Conqueror there was no church here; but before his death one was built of stone by Paulinus, sacrist of the church of Rochester. In later times Bishop Richard Young was a large contributor, and glazed all the windows. Bishop John, in the reign of Henry II., gave to the church of Rochester, Frindsbury Church, together with the chapel of Strood. The parsonage of Frindsbury and advowson of the vicarage still continue part of the possessions of the Bishopric of Rochester.

Upnor Castle is situated in this parish, opposite to Chatham Dock. It was erected by Queen Elizabeth in her third year, and presents a very picturesque appearance from the Medway. It was visited by Hogarth during his memorable five days' tour from Gravesend to Rochester, when he made two sketches, one of Upnor Castle, and the other the interior of a barber's shop.

To return to Strood, this manor, with the Hundred of Hamel, was given by King Henry II. to the Knights Templars, who had a mansion in the southern part of this parish near the banks of the Medway, which from their possessing it acquired the name of Temple Manor. This gift was confirmed to them by King John and his son Henry III., but in the beginning of the reign of Edward II. the Knights Templars, on pretence of their vicious lives and overgreat wealth and power, were seized and imprisoned, and their lands and goods confiscated. The whole order of them was dissolved in 1312, and Pope Clement V. immediately granted their lands and goods to the Knights Hospitallers, and the king, Edward II., confirmed this grant, November 28, 1313. Edward III. granted the manor of Strood to Mary de St. Paul, Countess of Pembroke, widow of Guy de Valence. She intended to have built a religious house at her manor here, but, altering her mind, she gave it in the eighteenth of that reign to the monastery she had erected at Denny, in Cambridgeshire. The manor of Strode, alias Temple, continued in the possession of that monastery till its dissolution by Henry VIII., who granted it to Edward Brington, who alienated it to Sir George Brooke, Lord Cobham. His grandson, Henry Brooke, Lord Cobham, being convicted of high treason in the first year of James I., was pardoned his life; yet he forfeited all his estates to the Crown, and among them this manor of Strood. Soon after this manor was granted to Sir Robert Cecil, Earl of Salisbury, K.G., who married Elizabeth, sister of Henry, Lord Cobham, above mentioned. He died in 1612, and was buried at Hatfield, leaving this manor to his son and heir, William, Earl of Salisbury, who alienated it to Bernard Hyde, of London. His son, John Hyde, sold it to James Stuart, Duke of Richmond. It afterwards passed to the Blague, Lampport and Whitaker families.

The manor-house still exists about a mile south-west of Strood, pleasantly situated on the banks of the river Medway, and is called Temple Farm. It has a spacious vault beneath the building with groined arches in excellent preservation. A great room above overlooking the Medway with large bay window is of the Elizabethan age, and has since undergone but little alteration. It was near here where the Roman cemetery was discovered, before described.

Gilbert de Glanville, Bishop of Rochester (tempus Richard I.) built a hospital here near the east end of the church, afterwards called Newark or Strood Hospital. It was founded for cherishing poor, infirm and impotent travellers therein; but Henry VIII. did away with all these things, and their wants have never since been supplied. A few traces of the old walls of this hospital are still to be seen. If these old stones could speak, how they might denounce our modern poor laws, and say what they think of them. I have mentioned the church, which is adjacent. It is a very spacious modern structure, and, excepting a brass to T. Glover and his three wives, there is not much of interest. It was erected in 1812 at a cost of 8,500*l*. The tower is the only portion remaining of the old church which occupied the site of the present edifice. About the year 1832 a bell metal seal was found in a garden near the church, which by the inscription is supposed to have belonged to a monastery in Cambridgeshire. In 1772, some British coins of Elizabeth, James I. and Charles I. were found in an old hedgerow.

*Cooling.*

Hasted says:—"Eastward from Cliffe lies Cowling, anciently written Colinges and Culinges—so called from its cold and bleak situation." Cœnulf, king of Mercia, A.D. 808, gave to his faithful servant Eadwulf one plough land and a half, with all its appurtenances in Culinges, according as the bounds are in his charter mentioned. In the reign of King Edward the Confessor, the lordship of Culinges was in the possession of Earl Leofwyne, sixth son of Earl Godwin. He was slain at the Battle of Hastings fighting on behalf of his brother, King Harold, 1066, against William the Conqueror. William gave Culinges, among other vast possessions, to his half brother, Odo, Bishop of Baieux, as described in Domesday Book. On the disgrace of Odo, who became Earl of Kent, about four years afterwards, these estates at Cooling, or Cowling, as well as the rest of his possessions, became forfeited to the Crown. In the reign of Edward I. Cowling was in the possession of Henry de Cobham, of Cobham, in this county. His son, John de Cobham, in the reign of Edward III., obtained a charter of free warren within all his demesne lands in his "lordship of Coulyng," among others. In the twentieth year of that reign, at the making the Black Prince a knight, he paid respective aid for this manor, as one knight's fee, which Henry de Cobham before held in Coulyng of Margery de Revers as she did of the king. He died possessed of this manor the thirty-sixth year of that reign, and was succeeded in it by his son John de Cobham, who in the fourth year of King Richard II. obtained a license to embattle and fortify his manor house, which he then erected here, which grant he caused to be engraved on a brass tablet, and placed on a tower at the entrance of it, where it still remains visible, and henceforward this mansion acquired the name of Cowling Castle. This tablet is made in imitation of a deed or charter with his seal of arms affixed; the inscription is as follows:—

Knoweth that beth and shall be  
That I am made in help of the contre,  
In knowledge of whiche thinge  
This is chartre and witnessing.

It appears there was then a large park adjoining the castle. He died possessed of this manor and castle in the ninth year of Henry IV. leaving Joane, his granddaughter (daughter of Joane, his daughter, by Sir John de la Pole, knight), his next heir, then thirty years of age, and wife of Sir Nicholas Hawberk, knight, whom she had married on the decease of Sir Reginald Braybrook, knight, her former husband. She afterwards married Sir John Oldcastle, knight, who in her right possessed these premises, and, on account of his marriage with her, assumed the title of Lord Cobham, and had summons to Parliament accordingly in the eleventh year of King Henry IV. Hasted goes on to say:—"But in the next reign (Henry V.), engaging with others in a conspiracy, he was tried for it, condemned and executed." As a matter of fact, he was really accused of heresy, and summoned before Thomas Arundel, archbishop of Canterbury, and became the first Protestant martyr. For full account of these proceedings, see "Foxe's Book of Martyrs." Sir John on this accusation of heresy betook himself to his castle of Cooling as to a place of strength and security, before which the person sent with a citation from the Archbishop appearing, desired leave of him to enter and leave the same, but was refused, on which, not daring to enter without leave, he returned without performing his errand.

An old play ascribed to Shakespeare give a humorous

\* A paper read by Mr. W. F. Potter, architect, before the members of the Upper Norwood Athenæum.



account of the failure to deliver this summons. Lord Cobham's sentinel is named Harpool, and the Archbishop's apparitor is termed Sumner (a contraction for summoner), when the former compels the latter to eat the summons, parchment, wax seal and all, and so return to the Archbishop without delivering it. Sir John was, however, apprehended and tried, and committed to the Tower, from which he managed to escape into Wales, where he remained for four years, but was again seized and executed pursuant to his sentence, which was to be hanged for conspiracy and burnt for heresy. This cruel sentence was carried out in St. Giles-in-the-Fields, where a gallows was erected, and he was hanged to satisfy the State, over a slow fire underneath that his body might be burnt to satisfy the Church.

Happy we, living in different times.

After the execution of Sir John Oldcastle, Joane, his widow, became again possessed of this manor and castle, together with the advowson of the church of Cooling, and after marrying her fourth husband, she died in the twelfth year of Henry VI. She left a daughter, Joane, by her second husband, who married Sir Thomas Brooke, who became in her right the next Lord Cobham. His grandson, Sir John Brooke, Lord Cobham, died in the twenty-second year of Henry VII., seized of this castle, manor and advowson. His grandson, Sir George Brooke, Lord Cobham, K.G., resided at times here, and at Cobham, and died September 29, 1558. It was during his tenancy that Sir Thomas Wyatt raised his rebellion, and on January 30, 1553, he marched with six pieces of cannon to this castle, which, finding too strong to take, after having broken down the gate and part of the wall, and having some discourse with Lord Cobham, who was in it, he marched away next night to Gravesend. This Lord Cobham was succeeded by his son and heir, Sir William Brooke, Lord Cobham, who died in the thirty-ninth year of Queen Elizabeth, and by his will left this estate to his second son, George Brooke, who, being engaged with his brother Henry, Lord Cobham, and others in a conspiracy, was attainted of high treason in the first year of James I. After which King James restored the manor and castle of Cooling to his son William, then an infant, afterwards a Knight of the Bath, who died possessed of them about the year 1668. He left four daughters, all married, and their husbands in right of their wives joint proprietors of this manor, castle and advowson.

Hasted says:—"The ruins of the castle show it to have been a place of some strength. There are great parts of the towers and outer walls of it remaining; it was a square building having a moat all round it, which is now almost choked up. At a small distance south-east from the castle is a handsome gatehouse, flanked by two round towers, embattled, and with rich machicolations. Cannon balls made of Kentish ragstone have been found here, which no doubt were used in storming the castle. Rude pitchers have also been found, and in clearing away the rubbish from the walls a large vessel has been cut through, which proves that the tide once flowed up to the castle, though now 2½ miles distant from the river Thames.

Cooling Church, dedicated to St. James, is a small Gothic structure with a tower. In the year 961 Queen Ediva, wife of Edward the Elder, and mother of King Edmund and King Edred, gave to Christ Church, Canterbury, all her lands in Cūlinge, free from all secular service, except that of repelling invasions and the repairing bridges and castles. Edward II., July 14, in the tenth year of his reign, granted to the priory of Christ Church free warren in all their demesne lands in this parish, among others therein mentioned. The patronage of this church in the reign of King John belonged to Adam Pincerne; it afterwards (tempus Edward I.) passed into the hands of the Cobham family. There is a brass in the church to Faith Brooke, daughter of Sir John Brooke, Lord Cobham, 1508. There are fine steel engravings of both castle and church in Stockdale's "Views in Kent."

#### Cliffe.

This place is generally regarded as the Cloveshoo (Cliffe at Hoo), at which during the seventh and two following centuries, numerous councils of the Saxon Church were held. This place is first mentioned in 673, when Archbishop Theodore in a council at Hertford arranged with his bishops and clergy for an annual meeting at Clofeshoch (Ven. Bede). It is called Cliffe at Hoo from its nearness to that Hundred. This manor, with its appurtenances, was given to the Priory of Christ Church, Canterbury, in the time of the Saxon Heptarchy, and its possessions were afterwards increased here by King Offa, who in A.D. 791 gave Dunmalingdene, and by Queen Ediva, who gave Oisterland, all which remained part of the possessions of the Priory at the consecration of Archbishop Lanfranc in 1070. These possessions are described in the Domesday Survey. These manors and premises continued part of the possessions of the Priory of Christ Church till the dissolution of it by King Henry VIII., when it was surrendered into his hands. This king, on April 1, in his thirty-second year,

granted this manor to Sir George Brooke, Lord Cobham, and it remained in his family till Henry, Lord Cobham, was attainted of high treason in the first year of James I. It was afterwards granted to Sir Robert Cecil, Earl of Salisbury, K.G. (son of the eminent statesman, William, Lord Burleigh), and who had married Elizabeth, sister of Henry, Lord Cobham, aforesaid.

The village of Cliffe was formerly much larger than it is at present; part of it was burnt down by a casual fire that happened here in 1520, which disaster, says Lambarde, it has never recovered. The church, which is dedicated to St. Helen, is a large and handsome building equal most in the county. It consists of two side aisles, a nave and chancel, and at the west end is a good tower in which there is a clock and six bells. In the chancel are remains of painted glass, and in the roof are the arms of Archbishop Arundel. Here are likewise six miserere stalls, formerly for the use of monks of Christ Church when they came to visit their possessions in this parish. Cliffe was one of the earliest possessions of Christ Church, Canterbury, and was retained by that monastery till the Dissolution. It was excepted in the great deed of exchange which Archbishop Cranmer made with King Henry VIII., by which he conveyed all the rest of his estates in this parish to that king. The Archbishop of Canterbury still continues patron of this rectory. The brasses are—Thomas Faunce and wives and children, 1609; Bonham Faunce and wives and children, 1652. In the nave and north aisle are sepulchral slabs with short inscriptions in Norman French, of the fourteenth century. An ancient silver gilt paten, enriched with blue and green enamel, and having in the centre a representation of the Trinity, is preserved among the Communion plate. It is of the time of Edward III. Some beautiful sedilia on south side of sacarium and a piscina, and there are some ancient paintings on the east walls of the transepts. In the north one the Martyrdom of St. Edmund is represented with arcades, borderings and floral devices; it is supposed to be of late thirteenth century. In this transept there are still some masonry patterns. In the south transept the Day of Judgment is depicted. There is a fine carved pulpit of 1634. A list of the rectors of Cliffe, commencing with William de Witlesey, 1350 (afterwards Archbishop of Canterbury), is given in Hasted's "History of Kent"; among them is Edmond Cranmer, Archdeacon of Canterbury, 1549, and brother of the archbishop; also Hugh Weston, 1554, who became first Dean of Westminster.

Such are the records of the historic places we have visited to day, places that have played such very important parts in event and epochs in the history of our dear old country of England and which have greatly contributed to making it the proudest mother country of so many nations.

#### THE NEW YORK STEEL BUILDINGS.

AN interesting series of papers on "America at Work" is now in course of publication in the *Birmingham Daily Post*. The following is the author's description of the latest manner of building in New York:—

New York is a vortex of rebuilding. A contractor told me ten years is the life of a building in New York. In ten years it has not crumbled or bulged, nor does it look different from the way it did when first built. But it has become antiquated. It is only twelve storeys, a mere barn in height, and the proper height now is anything from twenty to thirty storeys. Its lifts, elevators, only go three times as fast as they do in England. Besides, there are not enough of them, and they stop at every floor. What is wanted is a system of many elevators to provide for local traffic, and express elevators that do not stop lower than the eighteenth floor. I have had pointed out to me a good hotel, built only eight years ago, with what are called all the most modern improvements. It is being pulled down so that a building twice as high may be erected.

"You English," said a man to me, "use a thing till it becomes useless. We Americans only use a thing till we get something better. It doesn't matter how good it is or how much it cost; we scrap-heap it."

Building in New York has ceased to be a thing for architects and masons. It has become a thing for engineers and riveters. The stone used is only a clothing to the skeleton steel.

The rage for steel frame skyscrapers has struck New York as the measles strikes a school of youngsters. Seven years ago American architects agreed that to put a building higher than sixteen storeys was to step into the region of danger. But that was seven years ago. Yesterday afternoon I smoked a cigar by a window on the twenty-ninth storey of the Park Row Building, absolutely the tallest block of offices in the world. Broadway far below was but a strip of ribbon, and people were like ants. The pyramidal Statue of Liberty guarding New York Harbour was reduced to the proportion of an ordinary-sized woman. The Cunard liner the *Campan*



in which I crossed the Atlantic less than a week before, was the size of a sixpenny toy boat. That will give you an idea of the height.

The offices on the top storeys of the Park Row Building never have any of the city dust, and flies, a plague in summer, never reach so high.

It is not alone eagerness to go half a dozen better than anybody else that has produced the present rivalry in erecting mammoth skyscrapers. New York is on a long island of rock, the business part of the town is the lower and narrower end, every inch is occupied, as New York is wrestling from London to itself the centre of the world's money market, and it cannot expand outwards; it has to grow upwards. The concentration of vast commercial interests has caused an enormous appreciation of land values. In the Wall Street neighbourhood ground costs about 60¢ a square foot.

To build on the English plan, with huge foundations, stout masonry, and only some five storeys high, would mean enormous rents, and the pushing of smaller firms "up town" out of the business area.

Americans must be "right there" within five minutes of everywhere. Accordingly engineers are now house-builders, piling up structures of little foundation, no width, no waste space in thickness of walls, but enormously high and providing a town of offices under one roof. Take the Flatiron. On each side of its twenty storeys are seventeen offices. Allowing an average of five persons to an office, you get a population of 1,700 business men.

The rebuilding of New York is not individual enterprise. Here are companies that have taken the work in hand. The Standard Oil Trust have several fingers in, and they are about to join blocks of buildings worth 11,000,000¢ by an arcade 30 feet long. The principal building firm is the Fuller Construction Company, with a capital of 12,000,000¢. The way it works is on this plan:—It fixes its eyes on a building of eight or ten or twelve storeys in a good business district. The owners are approached, and where they have been reaping per cent. or 4 per cent. from their property they are promised per cent. or 7 per cent. if they hand it over to the construction company, with the option of buying the new building at a certain price. They agree. Down comes the ten-storey building and up goes one of twenty or more storeys. Then a company is started to buy the building from the Fuller Construction Company, and the Fuller Company having "made a good thing," plunge into fresh operations. The Fuller Company never continues to own. Its work, with so enormous a capital, is to get hold of every block it wants, rebuild and sell out.

I went over four or five of these typical American buildings, with no style of architecture about them but the skyscraper style. They are not beautiful. You need not tell the American that. If you do, he will retort, "They were not put up to look pretty. They were put up to make money. They're doing what they were put up for. Guess you've no fault to find with that."

"Push!" is the motto of all engaged in building skyscrapers. I never saw a man dawdle. There seemed honest haste in everyone. I stood by the hour watching and talking and noting the haste. Most of the workers were men about thirty years. They were spry and elastic, and their wits were at the dance. If there was a check a man would halt, squirt bacco juice between his teeth at the adjoining wall and say, "Guess we'd better do it the other way." In an instant a fresh start was made.

The rock on which New York stands has a billowy surface. In places the rock is on top, and in others it lies under a cup of quicksand and hardpan. First caisson foundations are put in—large steel tuns, to get a flat-footed bottom in which the steel columns that will bear the strain of the framework will be fixed in concrete. When the rock is near the surface work begins to get away. If, however, there is quicksand to be got through there is delay. The excavating is done in air-tight chambers, and when bottom is reached concrete is laid; it hardens in twenty-four hours, and then the caisson can be fixed. Forty feet of quicksand and 12 feet of hardpan have been cut rough in seven days.

To put up a ten-storey building in a year was thought not long ago excellent progress. Not to be able to put up a twenty-storey building in six months is now thought evidence of slackness. To climb two storeys a week is the usual progress.

There is no waiting till the skeleton is complete before covering it with stone or brick. As soon as the engineers are a storey ahead the masons and bricklayers come along.

In the finest buildings the bottom storey has often a shell of granite or marble, and the upper storeys local white stone. Should there be a delay with the granite or marble, that means a delay with the casing higher up. Each storey bears its own weight of stone and brickwork. So you frequently see the stone encasing to the fifteenth and sixteenth storeys, the building complete and the windows in, while the twelfth, thirteenth and fourteenth storeys are nothing more than open

ironwork. To look at a mighty building half completed, and that half the top half, brings rather a jerk in the breath.

Only at first do you think the flimsiness must mean weakness. The scheme of the distribution of weight is scientific and mathematical. Each column is designed to bear a specific load, sometimes as much as three million pounds, and they have box-shaped flanges at each storey to bear the weight of the masonry. All through are steel braces to get lateral stiffness. The steelwork is protected by fireproof bricks, so in the event of a conflagration the steel will not warp. The floors are usually terra-cotta arches, laid in cement and covered with cinder concrete. The idea is to keep a fire confined to the storey in which it originates.

In several of the buildings I visited the lower floors were ready for occupancy—except for some plastering—long before even the steel skeleton was completed. Bricklayers trod on the heels of engineers, carpenters and plumbers followed bricklayers, and by the time the last bolt was being driven on the twentieth storey the office furniture was being moved into the first. The rent is calculated by the square foot of office room. In the Wall Street district you will pay 17¢ per month per square foot on the ground-floor. The average cost, however, for an ordinary three-room office of medium size about the centre of the building is 15¢ a month.

The objection that springs into the mind of the Englishman is that, as British towns are often built on clay, the steel frame could have no certain hold as when on rock. The answer is that in Chicago some of the loftiest blocks "float," as it is called, on clay. There is delving for 20 or 30 feet, and by compressed air the water is kept back. Then a concrete bed is laid. On this the caissons are put as though it were rock, and they are embedded in concrete, and the weight of a twenty-storey building will only sink the concrete into the bed of clay a couple of inches.

The highest block in the world, the Park Row Building, 382 feet, has thirty storeys, and thirty-two if the couple of rooms in the cupola are counted. It has a frontage of 103 feet, so that it is nearly four times as high as its width. The skeleton alone was 9,000 tons of steel. Yet it does not stand on rock. It rests on 3,500 spruce trees, with their bark on, 25 feet long and 12 inches in diameter, driven 24 feet into sand, and the remaining 1 foot flushed level with concrete. I looked up the side of the building, and though there were millions of bricks, it looked all as smooth as a plate of polished steel.

It is in buildings like these that New York commerce throbs. Here men, coatless, vestless, sit in their shirts, and with their sleeves rolled up. They are kept cool with a movable electric fan. They smoke green cigars. There is a movable telephone at their left elbow, and a typewriter on their right hand. They are mostly young men, tall, well built, and with nervous eagerness in every line of their clear-skinned faces. They drink iced water. Of course, they drink other things, but the American business man is a water drinking person. He hustles. Still there is often more hustle than haste. He will stand cursing for thirty seconds at the non-coming of an elevator to take him to the floor below when he could run down in fifteen seconds.

There are 7,000 elevators in New York, and they carry more than a million passengers a day. They are fast—six times as fast as English lifts. When I inspected the Park Row Building an apology was made to me that they were not the swiftest in New York.

But picture this: You go into a heavily marbled hall full of men in lounge suits and straw hats stuck on the back of their heads. In the centre is a half-moon of caged doors. Over them you see notices "Local," "Express to Thirtieth," and the like. There are two electric lamps above each door, and they alternately light up, showing the words "Up" or "Down." Over these again is a dial, and the dial is curving to and fro. You give one glance and you understand that No. 8 elevator is at the seventeenth storey, and that it is coming down. In case you are too busy to look you can hear a man, with a twang like a broken piano string, shouting "Local car on the right just coming down; express in the centre, no stop till the thirteenth floor; express to the twentieth on the left, then stop all floors; local between the thirteenth and twentieth floor there." And all the time those eight cage-doors are clatteringly opened, and they throw out crowds of men, and other men jump in and are shot, as from a cannon, skywards.

On each floor are the twin electric lamps "Up" and "Down," and over each elevator swings the hand on the dial. You know there just as well as on the ground floor where all the cars are, and you signal by pressing a button. An elevator will drop from the twenty-eighth storey to the floor with no halt unless there is a signal to stop. The descent makes you feel the bottom had fallen out of the world.

The constant rising and dropping affects the elevator men. They generally have to cease the work because of shattered nerves—that is, if they do not die suddenly from heart disease. Every elevator man gets disease of the heart!



## IMPERMEABLE MASONRY.

THE increasing demand for masonry to be employed in resisting the pressure of water in structures where the duty to be performed is trying, has made prominent the desirability of obtaining, if possible, concrete or other masonry which shall be impermeable to water. Civil engineers of extended experience in masonry construction, says the *Engineering Record*, realise how little ordinary masonry can be relied upon as a water-tight material. This is not denying that considerable quantities of concrete and rubble masonry have been constructed in dams which are essentially impermeable to water, but of the total mass of masonry structures in engineering work it is doubtless safe to say that but a small part is actually water-tight. In many places this is a matter of no consequence, the principal end to be attained being the preservation of the masonry mass in proper form and with proper carrying capacity. In other cases many an engineer would have been saved much apprehension, not to say anxiety, if he could have felt confident that his masonry would successfully carry the pressure of water without material loss. All masonry composed of natural stone laid in mortar is more or less porous, and however well made it may be that sensible absorption of water will take place; but this is not leakage.

The pages of the "Transactions" of the American Society of Civil Engineers, as well as much other engineering literature, give evidence of the desirability of attaining, if possible, impermeable concrete or other masonry for many purposes. A number of investigations have been made by Mr. George W. Rafter, Messrs. SooySmith & Co., and other investigators at one time or another, some of the results of which have been made public and others have not. Experimental work has also been done in this direction for the Metropolitan Water and Sewerage Board of Boston under the direction of Mr. F. P. Stearns, chief engineer. Finally, a number of tests as to the impermeability of gravel concrete of different proportions, under pressures of water ranging from 20 to 80 lbs. per square inch, have been made during the current year at the Thayer School of Civil Engineering, the results of which have been published as the thesis work of two of the graduate students, Messrs. McIntyre & True.

Throughout all these investigations, so far as they have been published, there has been a careful recognition of the necessity of sufficient mortar to fill the voids of the broken stone or gravel used in the concrete, but there seems to have been scarcely sufficient attention directed to one or two other essential qualities of the cement for the attainment of impermeability in the final mixture. Obviously it is essential that there should be sufficient mortar to fill the voids of the gravel or broken stone, those voids depending largely upon the method of preparation or selection of the broken stone and the variation in size of the stones of which the gravel is composed. In the past it has been almost universal practice so to prescribe the broken stone as to exclude the smaller sizes and make the voids from 40 to 45 per cent., or possibly 50 per cent. of the volume. Under such circumstances so small a volume of mortar as 30 per cent. of the total of broken stone would clearly fall far short of producing a water-tight mixture. Mr. Rafter was therefore judicious in specifying 40 to 45 per cent. of the volume of the aggregate for the mortar employed in his concrete. It may even be doubted whether 40 per cent. of mortar would always fill the voids of the broken stone, as the latter is usually prescribed. The voids of gravel, unless the smaller stones be excluded, will seldom exceed one-third of the volume, and hence 30 per cent. of mortar would usually fill the voids of such gravel.

As has already been intimated, however, it is not necessarily sufficient to employ a volume of mortar that is equal to the voids in the broken stone or gravel. The mortar is composed of certain portions of sand and cement, the voids of the sand itself sometimes exceeding 40 per cent. of its volume. It is just as essential to fill the sand voids as those of the broken stone or gravel. In order that voids of the sand shall be so filled as to produce impermeability, it is further requisite that the cement shall be ground fine so that the operation of setting, *i.e.* of crystallisation, shall leave no voids of sufficient size to permit water to find its way through them. It is not to be supposed that the operation of crystallisation which takes place in the setting of the cement will make that portion of the mass between the sand grains absolutely solid, but the interstices must be reduced as nearly to those of molecular dimensions as possible if the resulting mass is to be impermeable under sensible pressures of water. The question of fine grinding of the cement, therefore, is thus seen to play a most important part in the attainment of a watertight concrete. It is not sufficient that the cement as such shall be of excellent quality, but it must be ground so fine that after it is set there shall remain no spaces large enough to permit water to find its way through under pressure.

It is coming to be recognised more generally among civil engineers that the exclusion of the smaller sizes of stone from crushed rock in the making of concrete is unwise from the

point of view of both economy and carrying power of concrete, and in some kinds of stone at least it appears to advantageous not to exclude the crusher dust. It is obvious certain from the considerations which have been set forth that this balancing of broken stone has the further valuable result of aiding materially in securing impermeability of concrete or other masonry. The presence of the smaller fragments of broken stone as well as the dust will clearly aid in an efficient manner in closing any possible channels through the completed masonry, and the same observation holds in precise the same way in connection with balanced gravel containing the varying sizes from ordinary sand to the largest single stone permissible. Indeed, so essential a part does this balancing of broken stone and gravel play in securing watertight masonry that it is reasonable to suppose watertightness might be attained in concrete with sensibly less finely ground cement than were that balancing omitted. The use of the total products of the crusher as well as the naturally balanced gravel carries with it in this manner both its own economy and that of a less finely ground cement, while at the same time aiding in reaching the desired quality of impermeability.

In all experimental investigations, therefore, on the permeability of concrete it is absolutely essential, in order that the results may have their proper values, that the degree of balancing of the broken stone or gravel be determined and given as well as the fineness of grinding of the cement used. In these respects the data at present available in this particular line of work are far from complete, and in many cases so incomplete as to detract materially from the values of the results, if, indeed, that value is not sensibly destroyed. It is of little significance to state that the amount of mortar employed was 30 to 45 per cent. of the volume of the aggregate, if the size of the broken stone or gravel employed and the fineness of the grinding of the cement are ignored. The voids of the form may be reduced possibly to 15 per cent. and easily to 20 or 25 per cent. of the total volume with reasonable balancing, while otherwise the void space might reach 40 or even 50 per cent. of the total volume. It is clear, therefore, that 20 or 25 per cent. of mortar in the one case might answer all the purposes that 40 or 45 per cent. could in other cases. Similarly, the significance of No. 1 cement or No. 2 cement is equally indeterminate, whatever may be the rate of setting or the resistance of the mass after setting without the fineness of the material being known.

So far as experimental results now available indicate would appear that in order to attain impermeability in concrete whether of gravel or of broken stone, that the mortar mixture must be at least as rich as 1 cement to 2 sand, or 1 cement to 2½ sand, the proportion of mortar being sufficient to fill entire the voids, or possibly a little more than that in order to provide for inequalities of mixing in different portions of the mass. Although apparently mortar of 1 cement to 3 sand has occasionally been found impermeable under as high pressure as 40 lbs. per square inch, there is little evidence that such a mixture can in general be relied upon. In addition to the importance of these matters of composition to be employed for a permeable concrete, it is undoubtedly also of essential importance that the concrete should be kept thoroughly moistened during the entire period of setting, otherwise not only the ultimate resistance may be impaired, but also the impermeability by the slight contraction of setting in air which has been observed repeatedly. This has a marked influence upon the use of concrete in the walls of buildings, which in their subsequent experience may be exposed to driving rain storms, against which ordinary walls of masonry have frequently been found ineffective.

## THE TOWN OF RICHELIEU.

A CORRESPONDENT of the *American Architect* gives the following account of the town founded by the Cardinal, which is rarely visited:—

Richelieu lies in the midst of a barren plain some distance from the modern railroad station. The present approach to the city is dull, uninteresting, prosaic; but when, once we stand at closer range, under the shade of the old alleys of trees surrounding the city walls, the imagination runs riot. Nothing is changed—the old moat is still half-filled with water, and the quaint towers for the mousquetair defenders still retain their loopholes, while the city gates, though now without their drawbridges, are charming architectural compositions.

One can fancy the interest with which the grim old Cardinal planned this toy city. The impression is of a scene in a theatre, and one would not be in the least surprised to see His Eminence drive out, or D'Artagnan and his companion loitering in the archway. Every view affords a setting for the characters of Dumas.

Standing at the principal entrance we can see down a clear vista through the heart of the city the corresponding gate of



opposite side. It seems but a stone's throw away, and, indeed, is but a thousand paces.

There is no thought of radial avenues, the whole city being laid out on a simple rectangular plan. The extreme length measures about 960 paces, and the width, 360 approximately. The principal street is on the main axis, with two minor streets parallel to it. These, together with three shorter transverse streets, two of which traverse the two public squares, form the arteries of the city.

The houses are all alike, except that the buildings on the street corners are a storey higher than the others. The streets are not long enough to make this arrangement look too monotonous, but are, at the same time, sufficiently long to make the public squares the centres of interest. These squares are planted with trees in the most approved Republican manner, seen everywhere in France.

The houses, except the corner ones mentioned above, are three storeys high, in the familiar Henri IV. style, with stucco quoins and high slate roofs broken by dormers. The cornice line is brought down lower on the buildings around the public squares, making half-dormers of the upper storeys. This makes the cornice line of the squares lower than that of the principal street.

The church and market are the most conspicuous buildings, the church being of a seventeenth-century Jesuit type, and the market a picturesque but unpretentious structure.

The ground on which the city is built is perfectly level, with sufficient fall to the streets to drain everything to the centre of the town.

Richelieu was founded in 1631, some ten years after the commencement of the neighbouring château in the park of His Eminence the Cardinal Duc of Richelieu.

It is said that the Cardinal began this princely dwelling because he was envious to surpass the Châteaux of Champigny, Veude and Bonnavet in this same province of Poitou. Whether His Eminence was guilty of jealousy or not, the fact remains that, through his political influence, the château of Champigny, the heritage of the famous Mademoiselle de Mompensier was demolished. He attempted to tear down the chateau as well, but was defeated in this purpose through the intervention of the Pope. The histories give this affair as preliminary to the erection of his own château, and then proceed to mention the employment of 2,000 workmen upon his palace gardens. The men were under the direction of another cardinal, François d'Escoubleau de Sourdis.

Richelieu's architect was also the king's, Jacques Lemercier. The problem given to him was to preserve in the magnificent buildings, of which the Cardinal had conceived the plans, the plan in which His Eminence had been born—to permit, in other words, the ministerial pride to view at pleasure the contrast between the splendour of his old age and the humbleness of his beginnings.

That this plan was detrimental to the arrangement of the interior of the château, all of its admirers have agreed; but although the building was not a model of convenience, it was a veritable treasury of art. Decorated by Poussin and LeVost, it was filled with the antiquities which Mazarin, a simple abbé, purchased in Italy, a collection to which the Moorish Jew, and the most celebrated merchant of antiquities of his time, contributed no small part.

In 1642 the château was finished. In 1631 the Cardinal obtained letters patent, authorising him to found, adjoining his château, a city to bear his own name. He agreed to institute fairs a year and, in order to facilitate access to them, dug a canal from the Vienne.

In 1639, probably at the Cardinal's request, the Pope suppressed a neighbouring cure and installed it here. It was served by the priests of the Mission of St. Vincent de Paul. Lemercier gave them a church and a charitable hospital.

For the civil administration of the new city, the Cardinal appointed various magistrates and officers, who were each obliged to build his own house at his own expense and, as it was, according to Lemercier's designs.

The city was walled, a market and auditorium constructed. In 1633, the twenty-eight houses of the main street, four on each side, were nearly completed. The Cardinal's superintendent, De Sourdis, wrote to him:—"The houses of the principal street are marvellously advanced and they are the finest things in the world to see. It lacks only five houses to finish it."

Finally, to complete this ideal city of the Renaissance, the Cardinal decided to build an academy and obtained a charter for the establishment of a Royal College.

He had hoped to have the king visit it, but it is said that himself was so occupied by politics that he died without having seen the completed city on which he had expended so much money and so much thought. Indeed there are on record only two visits of the Cardinal to his château.

At Richelieu's death the château passed to his family. The duke was an emigré, and in 1793 the château was condemned. In the year XI., however, the duke's name having

been eradicated from the proscribed list, the château was restored to him, but he feared to return to France, and sold the building to speculators, who immediately began to demolish it for the stonework. Napoleon made an attempt to purchase it for military purposes, but was unsuccessful, and to-day there are few farmhouses in the district which have not been repaired or constructed with the stonework of the château. The collections are scattered all over Europe.

As a city Richelieu is a failure. It remains as it stood at the time of the Cardinal's death, with buildings unfinished and even the escutcheons on the completed buildings uncarved. Not a single house has been added, and only the establishment of the cure and the building of the church have saved the city from desertion.

The Cardinal had not considered the real factors in the growth of cities, and the attempt to establish a business community at a point which was neither on a navigable river nor a great trade-route was, of course, predestined to fail.

To-day the only sounds that greet the ears in Richelieu are the noise of one's own footsteps and the splash of the water in the fountain of the public square. The only traces of inhabitants are, here and there, white-bonneted peasant-women knitting in a courtyard or a couple of peasants drowsing in front of a café.

Thus the little city all but deserves the name that has been given it—it is called the "Pompeii of France."

## DISCOVERIES IN MEXICO CITY.

THE unearthing of the remains of an Aztec temple in the city of Mexico last winter promises to shed much additional light upon the ancient capital of the Aztecs. The discovery was made in the heart of the city, only two squares east of the great plaza, or Zocolo, and constitutes one of the most important archaeological discoveries made in recent years. In addition to the temple several huge monoliths, stone idols, incense-gum, spear-heads and other interesting objects were brought to light.

Some years ago, says a correspondent of the *Scientific American*, the eminent archaeologist, Señor Batres, of Mexico, projected a map of the city of Tenochtitlan as it existed in the year 1519 when first seen by the Spaniards. This map represented the city as an island intersected with canals running nearly at right angles corresponding to the streets of the present city. He located on the map the various temples and public edifices of the Aztecs, all of which, of course, had been destroyed by the conquerors. Back of the great temple, or Teocalli, which occupied the present site of the cathedral and major portion of the plaza, he located a temple called Coateocalli, meaning the house of many gods. He gave as his authority for locating this temple, Padre Duran, who wrote that the temple existed on the site occupied by the property of the Acevedos. Searching the archives, Batres found among the records in reference to an ordinance regarding the supply of water, under date of October 27, 1710, that the property referred to was on the corner of Relox and Cordobanes Streets, and consequently gave that as the locality of the temple of many gods, but as the corner was occupied by a fine old building, it was not supposed for a moment that any remains of the ancient temple could possibly be in existence.

Last winter the work of renovating or practically rebuilding the old palace occupying this corner was undertaken, for the purpose of furnishing suitable quarters for the Department of Justice. Captain Diaz, the son of President Diaz, was given charge of the work, and it is due chiefly to him that the discoveries were made. While the workmen were levelling off the patio, or central courtyard of the edifice, previous to putting down a new pavement, they came in contact with a hard solid foundation which proved to be a flight of stone steps going down into the earth. They would probably have covered them up again, and levelled off the projecting one at the desired height, had not young Diaz come along just in time.

Diaz ordered the men to keep on digging, cautioning them to use their tools carefully, and, following a line parallel with the steps, a trench was opened the entire length of the patio. At the further end of the trench, scarcely 2 feet below the surface, the men struck what appeared to be a round polished rock, around which they carefully worked, pulling the dirt out with their hands, till they had disclosed a monolith weighing several tons, representing a tiger recumbent, or ocelotl, ready to spring. A rude derrick was rigged up, the sculptured rock hoisted out of the hole, and it was weighed and measured.

Further excavating brought to light another rock sculptured to represent a serpent's head, which corresponds with two others previously discovered, and which were the corner pieces of the great wall enclosing the great Teocalli, within which are said to have dwelt 7,000 Aztec priests. Besides the great pyramid rising in the centre, upon which they made their human sacrifices to the war god, there were seventy-eight



chapels devoted to the worship of special deities. After the two huge monoliths were removed from the excavation, the digging proceeded and the dirt carefully removed, every object found was cleaned and put aside for the inspection and study of Señor Batres. The foot of the steps was finally reached at a depth of 13 feet below the level of the present city of Mexico, where they rested on a solid base or foundation of masonry, which was without question the level of the old city of Tenochtitlan; consequently the present city of Mexico must be some 13 feet above the level of the original city, which presents an interesting problem to the archaeologist.

At the foot of the steps many of the smaller objects were found, such as idols, remains of idols, incense-gum, spear-heads and ornaments, just as they had been thrown down by the Spanish conquerors. The stumps of two trees growing at the foot of the temple were also uncovered. These trees had evidently taken root after the destruction of the temple. They were found at irregular distances from the steps, and had the appearance of having grown spontaneously, just as the trees are growing at the present day out of the ruined walls of Palenque, and other aboriginal cities.

The recumbent tiger or ocelotl weighs 4 tons. It measures 2 metres 30 centimetres long, 1 metre 5 centimetres wide and 94 centimetres in height. Its mouth is open, showing huge teeth and a part of its tongue, and great round eyes give it a ferocious look. It is well modelled, with the tail properly curved around on one side as the animal is often seen in life. On each side of the head is a mane resembling somewhat the pendant part of the head-dress on the Egyptian Sphinx. On its under side are vestiges of paintings showing that it was originally painted with red and yellow to carry out more perfectly the idea or imitation of the American tiger. Cut in its back is a cylindrical cavity about 18 inches in diameter and 5 inches in depth. The sides and bottom of this cavity are sculptured with representations of Aztec figures or warriors.

The serpent's head, identical with the other two already discovered, represents the serpent with its mouth open and the upper lip rolled up over its forehead, disclosing the upper jaw with great tusks projecting down over the under lip. It is supposed that there were four of these heads, one in each corner of the great wall, and the design corresponds to similar heads graven on the Aztec Calendar stone. On the under surface of the heads Batres has deciphered a hieroglyphic which he calls "tres acatl," the date of the foundation of the Great Teocalli.

Among the other relics unearthed was a curious little idol cut out of a dark porous stone, about 10 inches in height. The workmanship is rather crude, but decidedly interesting, representing a head with scarcely any body, perhaps in a sitting posture with arms folded. The incense-gum, upon being removed from the earth which had surrounded it for centuries, resembled pieces of bone, but when, by the simple application of a lighted match, it burned and gave off the proper perfume, it was proved to be incense.

A number of stones were fashioned in the shape of skulls or death heads, with projections at the back as though they had been inserted into a wall. Some of them were painted white, which gave them a more horrible aspect. A very interesting relic was a piece of baked clay, a part of a foot of a colossal statue. The toes were perfectly modelled, showing the edge of the leather sandal beneath and the knots of the thongs holding it over the instep, as worn at the present day by the native Indians. Other smaller pieces of this same statue were found, and in handling them one could imagine the great war chief in full regalia, guarding the portals of the temple when set upon by the Spaniards and hurled down the steps to the bottom.

All the objects found are to be preserved in the National Museum, and it is proposed by Captain Diaz to leave the patio with the excavation open, showing the remains of the temple. The very interesting question now arises, How is it that the present city is 13 feet above the old one, as shown by the excavation?

#### CORONATION MEMORIAL, STAMFORD.

THE selected design by Mr. J. C. Traylen is monumental in character, of free Classic architectural treatment. The lower part is circular in shape, and stands upon a spreading base, which may be used as a seat approached by steps. The upper part is octagonal, having deeply recessed, arched and cusped panels on the four cardinal sides, divided by attached shafts at the angles, from the caps of which spreading foliage springs and fills the spandrels up to the cornice. A truncated termination is carried up above the cornice, upon which is fitted an elaborately wrought crown of iron, bronzed by an imperishable process. The crocketed ribs and the centre termination of it will form suitable attachments for the electric light. The total height from the pavement to the top of the arc light will be 20 feet. The materials of its composition will be granite, marble, bronze and iron.

The intention is to show that King Edward VII. was crowned on a certain date, and that at this time peace was concluded in South Africa. A bronze panel on the south side towards Ironmonger Street will set forth these facts. Above will be the arms of the King, highly emblazoned in color and gold by enamel, on copper or vitreous mosaicwork. On the east and west cardinal panels, respectively, the arms of Edward IV. and William Browne are introduced in rich wrought stonework with bronze panels setting forth the historical and worthy connection with the town. These panels are connected all round with cornucopiae garlands.

Especially in the case of Edward IV. may we quote Shakespeare, that after "the winter of our discontent," "our bruised arms are hung up for monuments," in commemoration of the battle fought for him by Stamford men at Losecoat Field, and of his grant of arms to the town. For similar reasons, in the war just concluded honoured space on this memorial is given for the names of the Stamford Volunteers who took part therein, in the north panel, beneath palms of victory and emblems of peace. And in this Crowning and Peace (according to the inexorable law and circle of destiny, as in the movement of heavenly bodies, the circle of the prismatic spectrum of colour, the circle of sequence of the chords of music, and the once-a-man-twice-a-child circle of our own lives) Peace will bring Wealth, Wealth will bring Pride, Pride will bring War, War will bring Poverty, Poverty will bring Humility, Humility will bring us round again to Peace. This legend, the keynote of the deeper intuition of the monument, will be imperishably graven on a belt encircling it, as a lesson for all time.

#### COLONSAY AND ITS ARCHEOLOGY.

THE islands of Colonsay and Oronsay, writes a correspondent of the *Glasgow Herald*, have attracted the attention of rovers and settlers from the very earliest times. Pleasing in outline, the islands possess bays and gray stretches which tempt the wandering seafarer to disembark. Yet to most Scotsmen Colonsay and Oronsay (which are at low tide) remain mere names, and for every 100 visitors to Iona we may safely say that a single pilgrim penetrates to the Priors ruins of Oronsay to view the ancient cross, unrivaled for beauty, and the large group of early sculptured slabs. Columba halted here on his way Iona-wards, and during succeeding centuries Norsemen lived and died on the islands. Some of their graves have in recent years been examined and found to contain horse bones and trappings. The dead Viking was interred also with his boat, his sword, shield, lance and axe, and utensils of gilded bronze and iron; while the good wife reposed in her last slumber with her cooling utensils, bronze brooches, and ornaments of amber and ivory ready to her hand. Probably during the wanderings of the Norse raiders of the ninth and neighbouring centuries, these islands were the scene of occasional strife. It is even now certain that during the still earlier centuries of the Christian era Colonsay saw many a tussel and more fighting and alarms than other Hebridean islands many times its size. Of this we can judge by the unusually large number of fortified hill tops. Among the "Duns" occur Nan Nighean, Meadhonach, Gallin, Domhnuill, Gibhinn, Caltaig, Cholla and Avain. Some of these are of large size, and the drystone masonry is still in good preservation. We know deplorably little of the history of these things, but the spade, scientifically applied to the green turf and protecting mould, would soon reveal many secrets.

It is curious in this connection to consider how much money leaves Britain yearly to be expended in exploratory work in Palestine and elsewhere in Asia and in Africa: yet so vast an amount of work of like character remains to be done at our very doors, with scarcely a beginning made. At the north end of Colonsay, and above high-water mark, are several spacious caves with passages and chambers. Accumulations many feet thick of shells only of edible shellfish, split bones and fire-fractured stones burden the floors, and tell of the human occupation of these shelters. The topmost layers of debris are, no doubt, modern, but the deeper strata may date back to very early times. Research here would find reward. The caves can be inspected only by artificial light, as daylight soon disappears as one penetrates inwards. Other interesting features of the islands are the old raised beaches, composed largely of yellowish sand, the result, of course, of rock denudation during a remote age. In several places on the islands occur stretches of sand of quite another kind, being absolutely white, the result of a curious process of a less remote period, the comminution of countless shells of land snails which for thousands of years have fed and died on the green turf. The brilliant colouring at times of these sea near Colonsay and Iona is largely to be accounted for by the presence of this pure white sand on the sea bottom. Thus the lowly snail has rendered the Hebridean seascape at times brighter than any similar colour-effect obtainable on the Mediterranean. Belonging to a period earlier



in the forts referred to are several monoliths and a circle of standing stones, but to a still earlier era belongs the shell mound in Oronsay, known as Caisteal nan Gilleann, not improbably one of the oldest known sites of human habitation in Scotland. The hillock stands isolated and prominent on the stony undulating grassy surface of Oronsay. The mound, some 30 feet high, is, like all the neighbouring area, composed of blown sand from the ancient raised beach. The top (before exploration by the late Mr. Galloway) was thickly covered with an enormous quantity of shell debris. Surprise has been expressed that, even in summer, such an exposed and inconvenient spot should have been chosen for what must have been a prolonged occupation, or series of occupations. I believe, however, the camping ground was originally on the ground, or very possibly in a hollow, and that during the centuries since the abandonment of the site the level of the surrounding sandy areas has been lowered by the blowing away of the soil, thus leaving the mound high and dry with its impenetrable and protective top quite intact and undisturbed. The relics obtained from Caisteal nan Gilleann are of the most interesting character. They consist of implements of stone, bone and horn, chiefly round-nosed, chisel-ended instruments. The end is rough (in which was inserted probably a handle of wood or horn), and the other bevelled and very smooth, as if the article had been employed for rubbing purposes, such as the preparation of skins. Several of these implements were discovered this year, as also many of the so-called anvil-stones. Bone pins or borers have been found; but the most important discovery of all took place many years ago, when eleven barbed harpoon heads, or fish spears, of bone were found. These were exhibited at the Fisheries Exhibition in London by their discoverer, the late Mr. Galloway; but before they could be submitted to various experts they disappeared, and their present whereabouts cannot be traced. Harpoons apparently similar have been found in Kent's Cavern, Devonshire, in association with implements of palæolithic type. Palæolithic harpoon and spear heads have been found on the Continent, at several continental and a Yorkshire specimen may be attributed to neolithic times. It is important to have the Oronsay specimens recovered and a comparison of them made with the examples above mentioned and with the specimens recently found in caves at Oban. From the standpoints of archaeology, natural history and geology the islands in the West to which our King and Queen have just paid a visit are well worthy of study and investigation.

### McKINLEY MEMORIAL.

COMPETITION has been arranged, of which the following is the programme, for the competition for the McKinley Memorial, Philadelphia:—

It is desired that the memorial shall include a portrait statue of President McKinley, with a suitable architectural setting.

The site selected is the point of ground in line with the centre of the window of the eastern pavilion of Memorial Hall, Fairmount Park, immediately opposite the eastern avenue of the Welsh Memorial, facing the roadway which extends from the Smith Memorial Gateway, westward. The general committee, however, reserves to itself the right to change the location should such action be found necessary.

The competition is open to any sculptor, without restriction as to citizenship or nationality.

Designs shall be in the form of sketch models in plaster at a uniform scale of 1½ inch to the foot. A type-written description of the design and material shall accompany the sketch-model. A competitor may submit more than one sketch-model.

The designs will be received at the office of the Secretary, 30 South Broad Street, Philadelphia, by whom they will be carefully arranged for inspection by the jury of award. All expenses of delivery of sketch-models must be prepaid by the competitor. Upon request by competitors models will be returned to them "collect." Those belonging to competitors outside of Philadelphia will be placed in the care of a responsible packer.

The sketch-models, with the accompanying descriptions, shall be deposited with the secretary, as above noted, between February 2 and March 2, 1903, inclusive.

The cost of the memorial, placed in position and complete, shall not exceed the sum of 30,000 dols. This sum shall include the erection of a full-sized model in staff at the site indicated.

The five designs that receive the prizes by the decision of the jury of award shall be publicly exhibited at the discretion of the general committee. The sketch-models submitted and not receiving prizes will not be exhibited or published until after the award of the jury is made public, and then only with the consent of their authors. All models not so retained for

exhibition will be returned, if requested, to the senders within a reasonable time after the announcement of the decision of the jury of award. A copy of the report of the jury of award shall be sent to each competitor.

There shall be a jury of award, composed as follows:—Wilson Eyre, jun., and Theophilus P. Chandler, appointed by the Pennsylvania Academy of the Fine Arts; Edward H. Coates and Charles E. Dana, appointed by the committee on works of art, Fairmount Park Art Association; J. Q. A. Ward and Paul Bartlett, appointed by the National Sculpture Society; Frank Miles Day, appointed by the Philadelphia Chapter of the American Institute of Architects. The jury of award shall examine the designs submitted, and shall report on the same in writing to the general committee, McKinley Memorial, within sixty days after March 2, 1903, as follows:—

1. Selecting the five designs to receive prizes of 500 dols. each, provided that no prize shall be awarded for a design which, in the opinion of the jury of award, cannot be executed for a sum not exceeding 30,000 dols. More than one prize shall not be awarded to any one competitor. The decision of the jury of award regarding these prizes shall be final. Five hundred dollars shall be paid out of the fund of the general committee, McKinley Memorial, to the author of each selected design immediately upon receipt of the report of the jury of award.

2. Selecting from the authors of these five designs the one to be recommended to the general committee for the commission for the entire work, provided the said jury of award decides that any one of these designs is deemed worthy of such recommendation.

No member of the jury of award shall be a competitor. In case of any vacancy occurring in the jury of award, the body making the first appointment shall have the power to fill such vacancy.

Should any competitor violate any of the conditions of this competition or disregard its terms the jury of award shall have power to place his sketch-model out of competition.

Should the design recommended by the jury of award be selected by the general committee, McKinley Memorial, then the said committee shall enter into a contract with its author for the execution of the work.

### HANDICRAFT DESIGN IN IRELAND.

THE revival of handicrafts, which has of late years been so manifest, has unfortunately, says the Baroness Rosenkrantz in the *Irish Times*, not carried with it a corresponding awakening to the danger of bad design. It seems to-day as if many craft workers felt that their goal had been attained when they could successfully manipulate their tools so that no error of workmanship could be detected.

The successful teaching of certain right-minded leaders has worked marked changes wheresoever their influence has been felt; but with the crafts in this country no modern spirit has yet breathed life into the fossilised creed of its design.

If one examines, for example, the designs of a hundred specimens of Irish lace from the best schools in Ireland, scarcely any trace of modernity is to be found, and the designs, apart from being copies and imitations of old designs, are woefully lacking in artistic understanding, and very often exhibit an absolute want of the most elementary knowledge of design and designing. Yet we find, as a rule, that this anachronism of decorative energy is carried out with admirable skill and technical perfection. A mastery of the technique is rightly considered needful, but unfortunately technique in lace, as in most arts and crafts, can be a dangerous foe.

The chief idea of the lace designer seems to be one that should be a secondary consideration, namely, to give opportunities for the display of different stitches. This is entirely a wrong principle, and one which should be speedily deposed. The object of all decoration is to ornament, to adorn; not to show off the skill and learning of the decorator.

It is popularly supposed that designing is the work of artists, forgetting that design or decoration is something far older than any academy.

Primitive man drew designs on his commonest utensils, and the spirit which prompted him is the very same one that should to-day animate us and lead us to decorate according to our present-day fancy the objects which are near and interest us, from a teacup to a lace scarf and a church window.

Unfortunately, we have grown accustomed to dictation; we do not question the intrinsic merit of what we are taught, and consequently we are perpetuating to-day the errors of our forefathers, and have lost the earnestness and sincerity which made them great. What is needed is a revival of the old simple expression of individual feeling, expressed with the enlightenment of to-day. That revival of old forms of expression is not to be tolerated if it be unaccompanied with modern feeling; and here it is that we meet a formidable error now in



danger of being promulgated in Ireland, although as yet it has not affected lace designing.

In the desire to accentuate the characteristics of the Irish nation a strong movement is being made to introduce Celtic design as a decoration for modern objects. Where it is possible to reproduce the feelings, the spirit of the true old Kelt, Celtic design will be in place, but there and there only. It is misplaced upon a Renaissance bureau, and becomes an anachronism unparalleled perhaps in the history of decorative art. It is wrong, and should be impossible for us to shut our eyes to the centuries of design which separate us from Celtic work. Ireland, like all other countries, has passed through the Gothic and Renaissance periods, and stands to-day as far from Celtic art as France does from that of Byzantium.

It is not the object of this article to condemn Celtic designing, but to point out that designers of to-day who are strongly under the influence of this ancient art should be encouraged to gather from it what is best, and what will most rightly harmonise with the spirit of to-day, and not allow themselves to be bound to the servile imitation of an art which was so restricted that no scope was allowed for eventual development. No designer should forget that the art of to-day walks hand in hand with the progress of the nation, and is part of the unending chain to which each successive generation adds a link, each link bearing the hall mark which distinguishes it from others. A servile imitation of a past art has invariably presaged the decline of a nation; never its revival. While fresh adaptations of the eternal laws governing beauty are the sign of health and vigour, imitation is the sign of decadence, the conscious avowal of lack of creative force.

We must be courageous to-day, and remember that as long as we wish to decorate our surroundings the power is in us to do so, and that it is not by slavish copying but by spontaneous and honest efforts that we shall succeed in satisfying our instinctive desire to enjoy what is æsthetic.

Let it not be thought needful that a designer must necessarily be a trained artist in the ordinary acceptance of the term. The careful study of plaster casts and all the routine of the "life class" will be of small assistance to the man who wants to make his drawing-room beautiful or to ornament a lady's scarf. The training necessary for these lies nearer the heart and home, and does not ask for accurate copies from nature.

To make an accurate copy of a daisy is one thing, to draw it in decorative relation to other daisies or other objects is quite another, and demands less a knowledge of the flower itself than an instinctive and trained sense of the sort of company it ought to keep in the fairyland of imaginative art.

The training necessary for the designer is one which can be had by all who wish for it, in the same way that an "eye for colour" or any other sort of eye can be developed by anyone who conscientiously attends to the subject. The would-be designer must learn to know the meaning of the word "tradition" in art, and when he understands why a conventionalised tree or horse fulfils a high purpose in the field of ornament, he is already an advanced student in his art, and is in the position to express his own pleasure in trees and horses by honest attempts to render his impression of these as ornaments in whatever handicraft he happens to be working. If the truth of this be once grasped the craftsman will no longer care to work from ancient models.

Irishmen have a splendid tradition in the old art of their country, and if by studying it no new development on modern lines be possible, yet the student will surely imbibe some of the delight in the symmetrical filling of space, some of the joy in grotesque form and interwoven pattern which are the enduring virtues of Celtic art.

## GENERAL.

**The National Trust** announce that the beautiful woodland and meadows by the side of Derwentwater are to be publicly declared open for the enjoyment of future generations of residents and tourists at the English lakes on October 15. On that day Princess Louise, who is vice-president of the National Trust, will go over from Lowther Castle to perform the ceremony. It is the first time that the shores of any British lake have been thus dedicated to the public.

**The Tunnel of the Niagara Falls Power Company** was lately inspected after five years' use. No brick was out of place, and the work seemed as sound as when first laid. The brickwork was laid in Portland cement mortar.

**Emerich Steindl**, the architect of the new Parliamentary building for Hungary, died in Buda Pesth on Sunday last in his sixty-third year. Although completed the building has not yet been opened.

**Designs are being invited** from British sculptors for a monument to cost from 5,000*l.* to 6,000*l.* in position at Dominion Square, Montreal, as a memorial of Canadian soldiers who fell

in South Africa, and to commemorate Lord Strathcona's generosity and patriotism. The Strathcona and South Africa Memorial Fund offer premiums of 50*l.* and 25*l.* for the two first designs.

**The Northampton Street Improvement Committee** propose to expend 24,100*l.* on widening the lower part of Sheep Street. The Local Government Board have sanctioned 11,600*l.* for the widening of the West Bridge.

**The Birmingham Municipal School of Art** will commence the new session on the 15th inst. In the architectural section Mr. W. H. Bidlake, M.A., will lecture on architectural history, and Mr. C. H. Bateman and Mr. H. T. Buckland on architectural design. Mr. A. Watson, a gold medallist, will teach modelling and modelling design. The water-colour classes will be taught by Mr. J. V. Jelley, and instruction in heraldic drawing will be given by Mr. Treglown.

**A Statue** of the late Sir Man Singh of Ajodhya, the founder of the British Indian Association, was unveiled in the Kaiserbagh Baradari on August 13 by Sir James La Touche Lieutenant-Governor of the United Provinces. The statue which is of white marble, was carved by Messrs. Farmer & Brindley at a cost of 2,000*l.*

**The British Vice-Consul** at Philippeville, in Algeria says:—"The quarries at Chemtoll produce the most beautiful onyx marbles in the world. The interior of the new town hall at Constantine is decorated with them; the grand staircase and *salle des fêtes* are lavishly adorned with the most delicately veined and coloured onyx. It is a great pity that these marbles are not better known. A new quarry has been discovered near Ain M'lila, from which I have seen specimens of pure white rose and yellow onyx quite uniform in tinting."

**Portions of the Wall** of Roman London have been laid bare in the demolition of Christ's Hospital, Newgate Street.

**The Statue of Balzac**, which is to be erected in the Avenue Friedland, near which he lived in the last years of his life, is at last completed. The author is represented as seated. It was one of the works of the late J. A. J. Falguière.

**The Norman Work** at St. Mary's Church, Chatham, can not be wholly preserved in the rebuilding of the nave owing to the decayed condition of the masonry. The centre arch has been taken down, but its columns are to be reconstructed of the old Norman material. The two Norman side arches will remain intact.

**The Acting Lord Chamberlain** has again intimated to the London theatre managers that no house will be licensed unless its structure has received the approbation of the London County Council.

**A Test** of acetylene gas as an illuminant, which was made at Father Point, one of the most important lighthouses on the St. Lawrence, proved successful.

**The Statues** representing the seven Edwards which adorned the entrance to the annexe to Westminster Abbey erected for the Coronation, have been removed to Windsor Castle. The annexe itself has been sold for old building materials.

**The Palestine Exploration Fund** have at Gezer discovered a cave, artificially cut, about 30 feet long, made to serve as a crematorium, with a chimney cut in the rock. The floor is thickly overlaid with calcined human bones. Above this stratum of cremated remains are unburnt remains of late interment, the bodies having been buried in the contracted position. Pottery, much of it perfect, occurs largely in both strata. The remains appear to belong to two distinct races, both pre-Israelite.

**Mr. J. T. Nettlehip**, who gained some reputation as a animal painter, died on Sunday last. His special study was wild animals, and in a large number of pictures and drawings he showed how deeply he had been impressed by the form, the movements and the colours of beasts of prey, especially lions, polar bears and leopards.

**The Dedication** of the new bells at Oldswinford parish church, Stourbridge, took place on Saturday, the 30th ult. Two new bells have been added to the peal, one of the old one has been recast; and after removal to Loughborough for retuning, &c., the bells have been rebung on new frame work. Oldswinford is one of the old churches of the diocese; mention of it going back to the thirteenth century; the oldest bells of its present peal are dated at the end of the Stuart times, and four of them have apparently been in uninterupted use since 1686 and 1687.

**The Thirteenth-century Church** at Eastry, Kent, has for several years been under restoration, and an effort is now being made to raise funds to complete the work. The present church is the third which is known to have been erected on the site, the original building having been, according to some authorities, a temple of Eastre (or Eostre), the goddess of Spring.

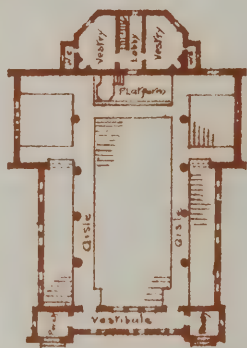


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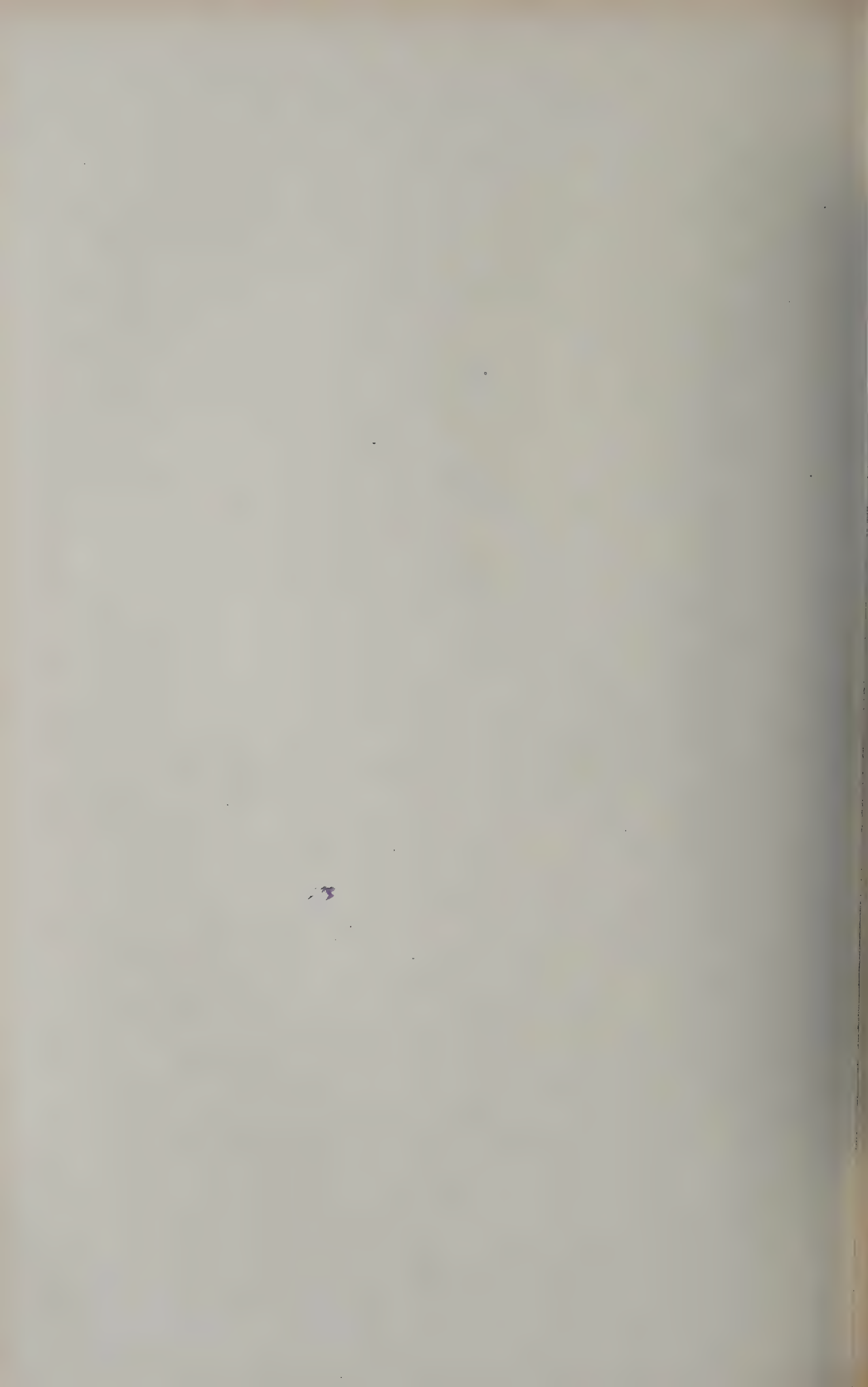




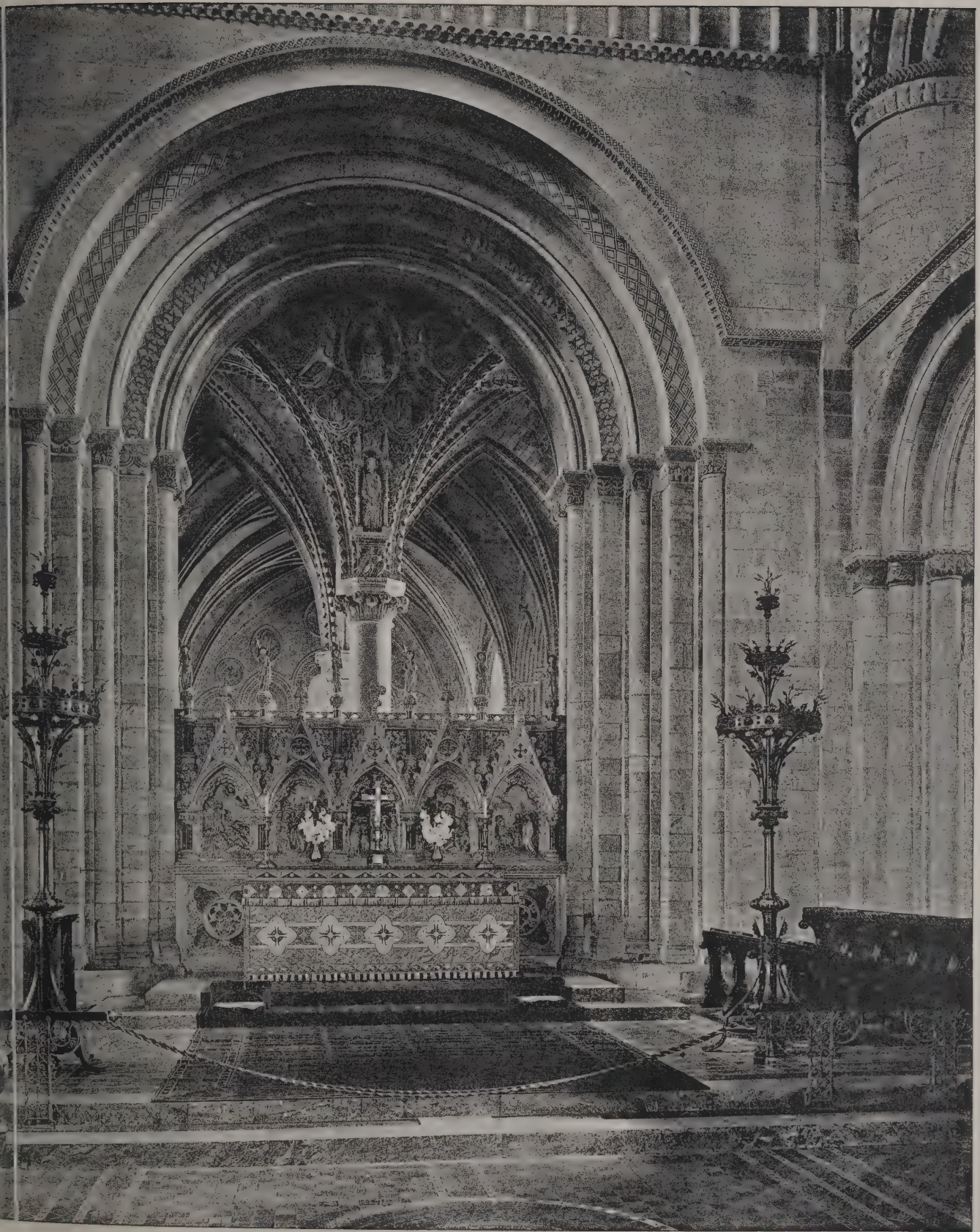


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THE

## Architect and Contract Reporter.

## EDITORIAL NOTICES.

*In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

## TENDERS, ETC.

*\*\* As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

## COMPETITIONS OPEN.

**BERMONDSEY.**—Sept. 16.—Designs are invited for artisans' dwellings to be erected on land at Rotherhithe, within the borough of Bermondsey, and known as the Fulford Street area. Premiums of 100l., 60l. and 40l. will be awarded. Mr. Fredk. Ryall, town clerk, Town Hall, Spa Road, S.E.

**BIDEFORD.**—Sept. 25.—The Town Council of Bideford are about to erect municipal offices and a public library upon a site opposite the west end of the Long Bridge, Bideford, and they invite designs for the proposed buildings. Premiums of 30l., 15l. and 10l. respectively are offered for the designs which shall be placed by the Council first, second and third in order of merit. Designs and descriptions, &c., are to be delivered to Mr. Wm. B. Seldon, town clerk, 18 The Quay, Bideford.

**INDIA.**—Nov. 1.—Competitive designs are invited for the erection of a memorial to Her Majesty the late Queen Victoria at Allahabad. A premium of 2,000 rupees will be awarded to the design selected by the committee. Mr. H. Nelson Wright, Indian Civil Service, honorary secretary, Queen Victoria Memorial Fund Committee, Allahabad, India.

**LIVERPOOL.**—Sept. 15.—Designs are invited for new labourers' dwellings to accommodate about 2,500 persons, to be erected on the Hornby Street area. Premiums of 250l., 150l. and 100l. respectively are offered for the first three selected designs. Particulars will be supplied by the Town Clerk.

**MAIDENHEAD.**—Oct. 1.—Designs for free library. Premiums offered of £50, £20 and £10 respectively. Mr. John Kirk, town clerk, Guildhall, Maidenhead.

**NEWARK.**—Oct. 14.—Designs and suggestions are invited for alterations and additions at the infirmary, Bowbridge Road, Newark, comprising a board and committee-room, a new mortuary and provision for twenty extra beds. A prize of twenty guineas is offered for the best plans sent to the office of Mr. M. H. Colton, clerk, 27 Lombard Street, Newark.

**SOUTHEND.**—Sept. 7.—Designs are invited for a church to accommodate 500 persons, a clergy-house, and a parochial hall or parish-room about 50 feet by 30 feet. Mr. C. H. J. Talmage, Kathleen Villa, Southchurch Road, Southend-on-Sea.

## CONTRACTS OPEN.

**ACTON.**—Oct. 7.—For erection of a refuse destructor. Mr. D. J. Ebbetts, surveyor, 242 High Street, Acton, W.

**BEETHAM.**—Sept. 8.—For erection of village schools, Beetham, Westmorland. Mr. John F. Curwen, architect, 26 Highgate, Kendal.

**BEVERLEY.**—For the erection of Wesleyan Sunday schools at Beverley, Yorks. Messrs. W. J. Morley & Son, architects, 269 Swan Arcade, Bradford.

**BRISTOL.**—Sept. 10.—For erection at Stapleton of an infirmary for the accommodation of about 875 sick patients. Mr. J. J. Simpson, clerk, St. Peter's Hospital, Bristol.

**CHESTERFIELD.**—Sept. 10.—For erection of an isolation hospital to accommodate thirty patients at Penmore, in the parish of Hasland, Chesterfield. Mr. G. E. Bolshaw, architect, 189 Lord Street, Southport.

**CLOUGHFOLD.**—For alterations and extensions at the brewery, Cloughfold, Lancs. Mr. John Wilson, architect, Bacup.

**COLWYN BAY.**—For erection of first-class business premises. Particulars on application to Brown & Son, solicitors, Bank Chambers, Grimsby.

**COWFOLD.**—Sept. 16.—For alterations and additions to East Ridge, Cowfold, Sussex. Mr. William Buck, architect, Horsham.

**COWLING.**—Sept. 8.—For about 80 roods of fence walling at Stott Hill farm, Cowling, Yorks. Mr. J. Whitley, Temple Buildings, Keighley.

**DERBY.**—Sept. 29.—For erection of a school on the Normanton Road. Mr. A. Macpherson, architect, Tenant Street, Derby.

**DEVONPORT.**—Sept. 18.—For erection of buildings at the gasworks. Mr. A. B. Pilling, town clerk, Devonport.

**DEWSBURY.**—For erection of four workmen's cottages. Plans and specifications may be seen at the works of the Savile Town Chemical Co., Ltd., Mill Street East, Savile Town.

**DEWSBURY.**—For erection of two scullery houses at Thornhill Lees. Mr. Frank Dixon, Thornhill Lees.

**DOVER.**—Sept. 9.—For erection of Turkish baths adjoining the town hall, Dover. Sir Wollaston Knocker, town clerk, Castle Hill House, Dover.

**ENFIELD.**—Sept. 9.—For erection of a deaf centre and additions to the junior mixed and infant departments at the Bush Hill Park school, Enfield, Middlesex. Mr. G. E. T. Laurence, architect, 22 Buckingham Street, Adelphi, W.C.

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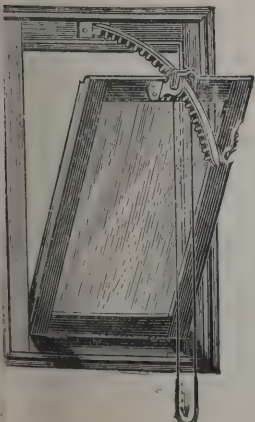
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**HACKNEY.**—Sept. 11.—For erection of coal stores. Mr. George Grocott, town clerk, Town Hall, Hackney.

**HAMMERSMITH.**—Sept. 23.—For erection of board-room, clerk's offices, receiving home for children and out-relief offices. Mr. J. H. Richardson, architect, 87 Finsbury Pavement, E.C.

**HAMMERSMITH.**—Sept. 24.—For erection of a block of workmen's dwellings in Yeldham Road. Mr. H. Thompson, town clerk, Town Hall, Broadway, Hammersmith.

**HANWELL.**—Sept. 15.—For construction of an above-ground convenience (containing two w.c.'s) in the cemetery at Hanwell. Mr. Wm. Chambers Leete, town clerk, Town Hall, Kensington, W.

**HENDON.**—Sept. 15.—For erection of a pair of cottages at the sewage outfall works, Renters Lane; the erection of a corrugated iron fire-escape shed, Institute Road; and the supply and erection of entrance gates, boundary fencing, &c., at the Council offices. Mr. Henry Humphris, clerk, Urban District Council offices, The Burroughs, Hendon, N.W.

**HEREFORD.**—Sept. 12.—For erection of an isolation hospital in the parish of Stretton Sugwas. Mr. Thomas Llanwarne, clerk to the Rural District Council, 8 St. John Street, Hereford.

**HORNSEY.**—Sept. 22.—For taking-down fencing, &c., in Tottenham Lane, and erecting a new dwarf wall, with iron fencing, gates, &c. Mr. E. J. Lovegrove, engineer, Southwood Lane, Highgate, N.

**HULL.**—Sept. 12.—For erection of a synagogue and school-rooms in Osborne Street. Messrs. Ansdell & Cox, architects, 50 Savile Street, Hull.

**ILKESTON.**—Sept. 16.—For erection of a laundry, with additions and alterations to the administrative department, at the Ilkeston hospital, Heanor Road, Ilkeston. Mr. Charles W. Hunt, architect, 132 Station Road, Ilkeston.

**IRELAND.**—Sept. 8.—For erection of an electric power station, 42 feet by 25 feet, in brick, with steel principals and slated roof, at the Grosvenor Street goods terminus, Belfast, for the Great Northern Railway Company (Ireland). Mr. T. Morrison, secretary, Amiens Street Terminus, Dublin.

**IRELAND.**—Sept. 9.—For erection of water-closets, bath-rooms, lavatories, &c., in the fever hospital at the Belfast workhouse. Mr. James C. Neeson, clerk to the Guardians, at the Workhouse.

**IRELAND.**—Sept. 9.—For erection of a Crown post office and caretaker's residence at Castlebar, co. Mayo. Particulars can be obtained at the Office of Public Works, Dublin.

**LAMBETH.**—Sept. 17.—For erection of bathrooms for females and extension of female clothing stores at Renfrew-Road workhouse. Mr. S. R. J. Smith, architect, 15 York Buildings, Adelphi, W.C.

**LEEDS.**—Sept. 8.—For preparing the foundation of the Killingbeck hospital for smallpox, including formation of a new road. Mr. Edwin T. Hall, architect, 54 Bedford Square.

**LEIGHTON BUZZARD.**—For erection of an additional ward at Grove Hospital. Mr. J. T. Lawrence, architect, Leighton Buzzard.

**LEYLAND.**—Sept. 16.—For erection of business premises on Chapel Brow, Leyland. The Leyland and Farington Co-operative Society, Ltd, Golden Hill, Leyland.

**LLANELLY.**—Sept. 8.—For construction of a bridge over the river Lliedi, Llanelly. Mr. J. Vaughan Stewart, engineer, Harbour Office, Llanelly.

**LONDON.**—For foundations to ground lines and 25,000 super feet concrete flooring, for the Agricultural Organising Agency, Ltd. Plans and specifications may be seen on application to the Surveyor, M. 2, Store, Millwall Dock.

**LONDON.**—Sept. 18.—For construction of a new operating-room at the infirmary, East Dulwich Grove, S.E. Mr. G. D. Stevenson, architect, 13 and 14 King Street, Cheapside, E.C.

**LONDON.**—Oct. 7.—For erection of a new cartshed, bothy, &c., at Sydenham Wells Park, S.E. Particulars at the General Section (Architect's Department), L.C.C., 18 Pall Mall East, S.W.

**MANCHESTER.**—Sept. 8.—For alterations and repairs to the Brook Street bridge over the river Medlock. Particulars and form of tender may be obtained on application at the City Surveyor's Office, Town Hall, Manchester.

**MANCHESTER.**—Sept. 8.—For erection of an underground convenience (water-closets and urinals) at Walkden. Mr. John T. Proffitt, surveyor, Walkden, near Manchester.

**MANCHESTER.**—Sept. 12.—For erection of a two-storeyed public lavatory at Blackley. The City Architect, Town Hall, Manchester.

**MARGATE.**—Sept. 8.—For sinking of a well and working shafts, and driving about 3,200 yards of adit at Wingham, about

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NORWICH.—Sept. 16.—For erection of addition classrooms and alterations at the Thorpe Hamlet girls' school and Nelson Street boys and girls' schools. Mr. C. J. Brown, architect, Cathedral Offices, Norwich.

PLYMOUTH.—Sept. 10.—For erection of a dry wall at Knighton, and laying pipes at Wembury Ford. Mr. Fred. Wm. Cleverton, clerk, Rural District Council, 4 Buckland Terrace, Plymouth.

PONTEFRAC.—Sept. 10.—For rebuilding the Greyhound inn, Pontefract. Mr. William Hurst, architect, Pontefract.

ROTHERHAM.—For erection of three saleshops and dwelling-houses and two dwelling-houses at Canklow. Mr. H. Senior, 68 Westgate, Rotherham.

SABDEN.—Sept. 13.—For erection of boundary walls at Wesley chapel, Sabden, Lancs. Mr. Gregson, surveyor, Padham.

SCOTLAND.—Sept. 10.—For erection of a new wing to Dundarroch House, Pitlochry. Mr. J. Leonard, architect, Pitlochry.

SCOTLAND.—Sept. 10.—For alterations and additions to the farm colony block, for the Glasgow Lunacy District Board. Mr. Alexander Skirving, architect, 121 West Regent Street, Glasgow.

SCOTLAND.—Sept. 12.—For erection of stone school to accommodate 900 pupils, janitor's house, offices, parapet, area and boundary walls, bacteria tanks and drainage works, and making-up of playgrounds at Auchterderran, Cardenden, Fife. Mr. William Williamson, architect, 220 High Street, Kirkcaldy.

SCOTLAND.—Sept. 22.—For erection of an elementary school to accommodate 400 pupils, offices, parapet walls, &c, at corner of Sang Road and Gow Crescent, Kirkcaldy. Mr. William Williamson, architect, 220 High Street, Kirkcaldy.

SHEFFIELD.—Sept. 12.—For erection of a bridge over the canal at Coleridge Road, Attercliffe. Mr. Charles F. Wike, C.E., city surveyor, Town Hall, Sheffield.

SOUTHWARK.—Sept. 18.—For converting a railway arch at Ewer Street, Union Street, S.E., into stables, &c. Mr. G. D. Stevenson, architect, 13 and 14 King Street, E.C.

TRURO.—Sept. 8.—For erection of a rectory at St. Mary's, Truro. Mr. G. H. Fellowes Prynne, architect, 6 Queen Anne's Gate, Westminster.

WAKEFIELD.—Sept. 6.—For alterations and additions to property in Market Place, Wakefield. Messrs. Watson, Son & Ellison, architects, Barstow Square, Wakefield.

WAKEFIELD.—Sept. 10.—For erection of five cottages at Carlton, near Wakefield, Yorks. Mr. John W. Fawcett, secretary Industrial Co-operative Society, 10 Albion Street, Leeds.

WALES.—For erection of two houses at Caldicot, Mon. Mr. E. Blewitt, architect, Blaenavon, Mon.

WALES.—Sept. 8.—For erection of a cattle and sheep market at Llandovery. Mr. John Thomas, town clerk, Llandovery.

WALES.—Sept. 8.—For removal of St. George's pier, the construction of a sea-wall, promenade, &c., and construction and erection of a pier and floating landing stage. Mr. Thomas Hughes, clerk, Menai Bridge, Anglesey.

WALES.—Sept. 8.—For erection of a club building for the Briton Ferry Working-men's Club and Institute. Mr. H. Alex. Clarke, architect, Briton Ferry.

WALES.—Sept. 9.—For alterations to a building at Cardiff to adapt it for use as an electric-light station, for the Great Western Railway Company. Mr. G. K. Mills, secretary, Paddington Station, W.

WALES.—Sept. 10.—For erection of a schoolroom, &c., adjoining Calcaria Welsh Independent chapel, Bargoed. Mr. T. Roderick, architect, Clifton Street, Aberdare.

WALES.—Sept. 12.—For alterations at the public hall, Rhos. Mr. J. Trevor Jones, 51 Mountain Street, Rhos.

WALES.—Sept. 14.—For altering and making additions to Carmel Baptist chapel schoolroom, Troedyrhiw. Mr. Wm. Lloyd, 5 Beech Grove, Troedyrhiw.

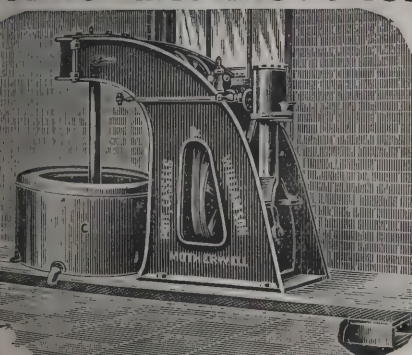
WALES.—Sept. 15.—For erection of a new school, consisting of mixed and infants' departments, at Llwyncelyn, Porth Mr. Jacob Rees, architect, Hillside Cottage, Pentre.

WALES.—Sept. 18.—For erection of a showroom, dwelling-house, &c., on the New Road, Dowlais. Mr. T. Roderick, architect, Glebeland, Merthyr.

WALSALL.—Sept. 8.—For erection of a school to accommodate 1,000 children and a caretaker's house at North Walsall. Mr. H. E. Lavender, architect, Bridge Street, Walsall.

WALLSEND.—Sept. 27.—For extension of the Carville junior school and caretaker's house, Wallsend. Clerk of the Board, Bewicke Schools, Willington Quay, R S O.

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**WALTHAMSTOW.**—Sept. 11.—For erection of a sorting office at Walthamstow, for the Commissioners of H.M. Works and Public Buildings. Particulars may be obtained on application to Mr. J. Wager, H.M. Office of Works, &c., Storey's Gate, Westminster.

**WESHAM.**—Sept. 30.—For erection of workhouse and offices at Wesham, Lancs. Messrs. Haywood & Harrison, architects, Accrington.

**WHITECHAPEL.**—Sept. 22.—For erection of stores, cart and van sheds, lodge and public urinals at the dépôt in Wentworth Street. Mr. G. W. Clarke, town clerk, 15 Great Alie Street, Whitechapel, E.

**WOOLWICH.**—Sept. 10.—For additions, repairs, drainage, &c., to Old Park House, and for additions, repairs, drainage, &c., to Goldie Leigh, both situate in Long Lane, Bostall Heath. Messrs. Church, Quick & Whincop, architects, William Street, Woolwich.

**WOOLWICH.**—Sept. 18.—For erection of municipal buildings at the corner of Wellington Street and Upper Market Street, Woolwich. Mr. A. Brumwell Thomas, architect, 5 Queen Anne's Gate, Westminster.

**WOOLWICH.**—Sept. 18.—For erection of a greenhouse at the new portion of Woolwich cemetery. Mr. Arthur B. Bryceson, town clerk, Town Hall, Woolwich.

EARLY yesterday (Thursday) morning the town hall, Batley, was destroyed by fire. It was an old building, and the Council are at present considering plans for the erection of a new town hall. How the fire originated is unknown, but the damage is covered by insurance.

At the half-yearly meeting of the Midland Centre of the National Federation of Building Trade Employers, recently held in Birmingham under the presidency of Mr. William Sapcote, a message of sympathy with His Majesty in his serious illness, and a fervent expression of hope for his speedy and complete recovery, was forwarded to Buckingham Palace. To this the following reply has just been received by the secretary from the Home Office:—"Sir,—I have had the honour to lay before the King the loyal and sympathetic message of sympathy from the Midland Centre of the National Federation of Building Trade Employers on the occasion of His Majesty's severe illness. His Majesty was pleased to receive the same very graciously.—I am, sir, your obedient servant, A. AKERS-DOUGLAS."

## TENDERS.

### ABINGDON.

For supply of gas-engine and pumps for supplemental water supply.  
W. ACKLING (accepted) . . . . . £185 0 0

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For repairs to Antony Wesleyan chapel, Devonport.

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Rothsey . . . . .	49	10	0
Pyne . . . . .	48	5	0
Taylor . . . . .	39	10	0
Kent & Paul . . . . .	39	5	6
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COLLINGS, Millbrook, Plymouth (accepted) . . . . .	34	19	0

### BRISTOL.

For erection of school premises at Mina Road, Bristol. Mr. H. DARE BRYAN, architect, 38 College Green, Bristol.

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E. Walters . . . . .	5,290	0	0
Stephens, Bastow & Co. . . . .	5,199	0	0
R. Wilkins & Sons . . . . .	5,098	0	0
S. Williams . . . . .	4,920	0	0
G. HUMPHREYS, Stapleton Road, Bristol (accepted) . . . . .	4,900	0	0

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A. E. W. Blissett . . . . .	581	10	0
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A. E. Wilkins . . . . .	529	0	0
J. Wilkins . . . . .	523	0	0
A. S. Scull . . . . .	522	0	0
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J. Moffat . . . . .	14,244	15	0
J. C. Truman . . . . .	13,990	0	0
C. Durrant . . . . .	13,900	19	6
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B. COOKE & Co., Westminster (accepted) . . . . .	12,566	3	2

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W. J. Snuggs . . . . .	£989	0	0
W. White . . . . .	979	0	0
H. Fulford . . . . .	912	8	8
P. J. Caesar . . . . .	910	0	0
A. G. Mardon . . . . .	895	0	0

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Tender not yet accepted.

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For piling, timbering and concreting the Alderman Dobson school. Mr. H. C. SCAPING, architect, Court Chambers, Grimsby.

Pedrette & Co. . . . .	£5,087	2	6
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H. B. James . . . . .	3,350	0	0
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## GALMPTON.

For erection of a village clubhouse at Galmpton, Churston Ferrers. Mr. W. F. TOLLIT, architect, Totnes.

W. A. Goss . . . . .	£933	0	0
E. Pike . . . . .	894	19	3
R. E. Narracott . . . . .	795	2	0
H. Drew . . . . .	783	0	0
HAZELWOOD BROS., Brixham (accepted) . . . . .	710	0	0

## HARROGATE.

For excavation and refilling of about 725 lineal yards of trench for an intended line of 7-inch cast-iron pipes. Mr. EDWARD WILSON DIXON, engineer, 14 Albert Street, Harrogate.

J. Buckley . . . . .	£108	15	0
G. Parsons . . . . .	99	13	9
Dickinson & Long . . . . .	81	11	0
J. Dunn . . . . .	72	10	0
J. FROST, 5 Haywra Street, Harrogate (accepted) . . . . .	45	6	0

## HARROW.

For street works in Vaughan Road, Butler Road, Cross Road, Whitehall Road and Lansdowne Road. Mr. J. PERCY BENNETTS, surveyor.

C. Ford . . . . .	£4,783	0	0
F. Dupont & Co. . . . .	4,314	5	2
Meston & Hale . . . . .	4,276	0	7
G. Wimpey & Co. . . . .	4,153	0	0
Bracey & Clark . . . . .	4,080	0	0
E. W. Hollingsworth . . . . .	4,058	8	2
T. Free & Son . . . . .	3,785	0	9
T. ADAMS, Wood Green (accepted) . . . . .	3,643	19	10
Felkin & Watson (withdrawn) . . . . .	3,361	0	0

## HULL.

For street works in Cœlus Street, Drypool. Messrs. WELSTEAD & EASTON, engineers, Prince's Dock Chambers, Hull.

T. C. Starkey . . . . .	£471	17	4
J. Robinson . . . . .	337	7	7
R. Fisher . . . . .	310	0	0
J. Brunton . . . . .	275	7	10
Boyce, Bradley & Co. . . . .	266	5	3
W. Burkitt . . . . .	257	15	0
Burrell & Stone . . . . .	255	16	0
A. H. ATKINSON, Saner Street, Hull (accepted) . . . . .	203	0	0

## IRELAND.

For construction of a main sewer in the village of Knocknagree.

J. J. Hickey . . . . . £137 0 0

For erection of a house at the sewage disposal works, Armagh. Mr. J. FINLAY PEDDIE, architect, 36 Scottish Provident Buildings, Belfast.

J. Kidd . . . . . £395 0 0

## KING'S LYNN.

For erection of a screw pile light beacon on the west bank of the Vinegar Middle Cut, King's Lynn Channel.

J. O. Brettell . . . . . £347 0 0

DODMAN & Co., LTD., Highgate Foundry, King's Lynn (accepted) . . . . . 285 0 0

## LEEDS.

For erection of offices, workshops and store-rooms at Springwell Street, Leeds.

J. H. WOOD, St. Columba Street (accepted).

For erection of a small shed and carpenter's and smith's shops, &c., at Antwerp Mills, Armley. Mr. C. S. NELSON, architect.

E. WALES, Morley Road, Armley, Leeds

(accepted) . . . . . £556 12 8

Fourteen tenders received.

## LEYBURN.

For installing apparatus required for heating the casual wards and for bathing purposes at the workhouse.

T. ARMSTRONG & SONS, West Witton, Leyburn,

R.S.O. (accepted) . . . . . £32 0 0

## LICHFIELD.

For erection of observation wards at the workhouse and construction of foundations, drainage, &c., in connection therewith.

Accepted tenders.

Mitson & Harrison, London, building . . . . . £262 16 0

Lowe & Sons, Burton-on-Trent, foundations, &c. 210 0 0

## MONKTON.

For erection of outhouses at the Monkton school, Jarrow.

J. Barrow . . . . . £10 18 0

J. A. M. Henderson . . . . . 10 10 0

GLEN & MOFFETT, Napier Street, Jarrow

(accepted) . . . . . 9 4 3

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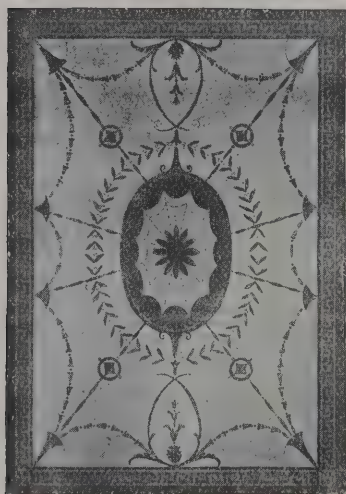
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**MORLEY.**

For erection of stabling, &c., Maxwell Street, Morley, Yorks.  
Messrs. R. CASTLE & SON, architects.

*Accepted tenders.*

G. Booth, Morley, mason.  
N. Holdroyd, Morley, joiner.  
A. Fawcett, Morley, plumber.  
E. Wilson, Morley, plasterer.  
J. Atkinson & Son, Leeds, slater.  
Young & Co., London, stable fittings.

**SCOTLAND.**

For alterations to steading at Smithy Croft, on the Bourtie estate, and alterations to steading at Mill of Craibstone, on the Craibstone estate, Aberdeen. Messrs WALKER & DUNCAN, architects, 3 Golden Square, Aberdeen.

*Accepted tenders.**Bourtie estate—Smithy Croft.*

J. Gray, Inverurie, carpenter . . . £126 0 0  
C. Coutts, Kirk Street, Oldmeldrum, mason . . . 69 14 0  
G. Mitchell, Jackson Street, Inverurie, slater . . . 65 13 0

*Craibstone estate—Mill of Craibstone.*

Stephen & Murray, Buxburn, carpenter . . . 115 0 0  
S. Christie, jun., Dyce, slater . . . 65 17 0  
A. Burnett, Persley, Woodside, mason . . . 62 19 0

For erection of large elementary school at the west end of Linlithgow. Mr. W. I. SCOTT, architect, Linlithgow.

*Accepted tenders.*

J. Hardie & Son, Bo'ness, masonwork . . . £2,146 10 5  
A. Bathgate & Son, Linlithgow, joinerwork . . . 1,154 0 1  
D. Blake & Co., Edinburgh, plumberwork . . . 439 0 0  
J. Millar, Falkirk, plaster, cement and tile-work . . . 290 0 0  
Cameron & Co., Phoenix Engineering Works, Govan, Glasgow, heatingwork . . . 244 8 5  
J. Millar, Falkirk, slaterwork . . . 143 0 0  
J. Gardner, Plains, Airdrie, wrought ironwork . . . 45 17 2  
W. Meikle & Son, Glasgow, glazierwork . . . 43 0 0

**SEBERGHAM CASTLE.**

For first part of new residence for Mr. C. J. Wilkinson, M.A. Mr. A. B. PLUMMER, architect and diocesan surveyor, Newcastle and Tynemouth.

G. BLACK, Carlisle, contractor (accepted) . . . £2,895 7 6

**SWINDON.**

For erection of the higher elementary school, Euclid Street. Messrs. BISHOP & PRITCHETT, architects, Swindon.

Downing & Rudman . . . £10,700 0 0  
McC. E. Fitt . . . 9,246 0 0  
H. & C. Spackman . . . 8,629 0 0  
J. Williams . . . 8,428 9 0  
A. J. Colborne . . . 8,409 0 0  
C. WILLIAMS, Swindon (accepted) . . . 8,356 17 10

For supply, delivery and erection of 252 accumulator cells and accessories at the electricity works, Swindon, Wilts.

TUDOR ACCUMULATOR COMPANY (accepted) . . . £1,102 0 0

**THORNABY-ON-TEES.**

For street works. Mr. C. T. JOHNSON, borough engineer.

W. O'Doherty . . . £2,441 0 0  
W. ROBINSON, Stockton-on-Tees (accepted) . . . 2,080 0 0

**WALES.**

For works in connection with the water supply for the village of Llangorse, including the providing, laying and jointing of 3-inch cast-iron mains and other pipes and fittings, the construction of tanks, culvert, excavations, &c. Mr. B. L. PRITCHARD, surveyor, 8 Castle Street, Brecon.

E. M. Davies . . . £1,250 10 0  
Nott & Co. . . . 1,002 15 8  
D. Willis . . . 935 18 3  
J. Sutherland . . . 784 11 0  
Fryer Bros. . . . 710 0 0  
E. A. Chase . . . 687 1 3  
C. T. EVANS, Hay, R.S.O., Breconshire (accepted) . . . 676 18 6

For construction of Coronation Road, Llantarnam.

Meredith . . . £4,820 17 4  
Lucas . . . 2,958 17 6  
Leadbeter . . . 2,847 0 0  
H. Linton . . . 2,798 0 0  
Geen & Linton . . . 2,786 8 11  
Dyson Parfitt . . . 2,537 0 0  
H. C. Parfitt . . . 2,382 0 0  
C. H. Reed \* . . . 2,302 0 0  
H. Davies (informal) . . . 2,150 0 0

\* Recommended for acceptance.

For erection of a municipal telephone exchange, Swansea.

H. BILLINGS (provisionally accepted) . . . £2,297 10 0

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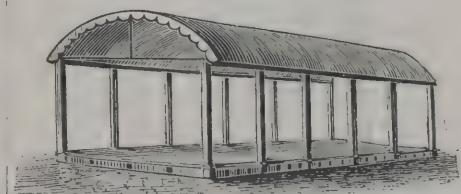
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## WOODFORD.

For street works at Sunset Avenue, Woodford Green. Mr.

WILLIAM FARRINGTON, surveyor.

Parsons & Parsons . . . . .	£1,097	17	9
Griffiths & Co. . . . .	1,090	4	11
J. Meston . . . . .	1,044	1	11
FRENCH BROS., Buckhurst Hill (accepted) . . . . .	1,038	6	6

## BUILDING AND BUILDERS.

To commemorate the Coronation the Council at High Wycombe have just decided to erect a new town hall. The Earl of Carrington has generously given the land for it.

A MISSION church is in course of erection in Curzon Street, Hurst, Ashton-under-Lyne. It is planned to seat 300 worshippers.

PREPARATIONS are being made in Johannesburg for providing middle-class houses, the balance of the purchase price to stand over at 7 per cent. interest. Facilities are being given for bringing building material from the coast, and houses of wire-wove material are being erected.

DR. F. ST. GEORGE MIVART has been appointed by the Local Government Board to inquire into the Birmingham Corporation's application to borrow 18,868*l.* for the extension of the infectious diseases hospital at Little Bromwich. The inquiry will take place on the 19th inst. at the Council House.

A MEMORIAL-STONE of the new church at Cressbrook, in the parish of Tideswell, Derbyshire, was laid on the 23rd ult. Messrs. A. & H. Hill are the builders, and the architect is Mr. W. R. Bryden, of 1 George Street, Buxton. The cost of the new building will be about 1,000*l.*

THE Llangollen Town Council have resolved to adopt a scheme entailing an expenditure of nearly 3,000*l.* for completely strengthening and securing Llangollen town hall, which has been pronounced unsafe and likely to collapse through the front wall being considerably out of the perpendicular.

THE newly-appointed Market Street improvement committee of the Manchester City Council met on the 28th ult. at the town hall, when Sir John J. Harwood was appointed chairman and Mr. J. J. Lambert deputy-chairman. The city surveyor and the city architect were instructed to prepare

plans for the information of the committee showing how the area might be best laid out, and it is understood the matter will be discussed at a subsequent meeting.

PLANS having been invited for the erection of halls to be used for Sabbath school and other Church work in connection with Larkhall parish church, those submitted by Mr. Eric Sutherland, 96 Renfield Street, Glasgow, have been selected, and he has been instructed to prepare working drawings and to have building operations commenced. The design embodies some novel architectural features, and the halls will be fitted up and equipped in the most perfect manner for the work for which they are intended.

A SERIOUS accident occurred on Monday at Tunbridge Wells, resulting in the death of one man and injuries to four others. The men were at work in connection with the erection of the new opera house on Mount Pleasant, when the scaffolding on which they were standing suddenly gave way, and they fell a considerable distance to the ground. A stonemason, named Murrell, was killed on the spot, and the four others were so badly injured as to necessitate their removal to the hospital, where two of them lie in a precarious condition.

ON Monday afternoon Sir Charles Dalrymple, Bart., M.P., Newhailes, opened the new school at Crookston, N.B., erected by the Inveresk School Board. Situated on the main road between Dalkeith and Tranent, a little over a mile south of Musselburgh, the building is a handsome structure of brick, one storey in height, standing in the centre of extensive playground accommodation. It contains a large central muster hall, off which branch six classrooms, capable of accommodating sixty pupils each. There are, besides, the usual teachers' rooms, &c., and the building is heated throughout by hot-water pipes.

THE ceremony of laying the foundation-stone of the church of St. George for the new and increasing village of Badshot Lea took place on the 23rd ult. The site of the new church adjoins the main road, and is opposite the Board schools, and quite in the centre of the locality. Built in the Gothic style, of local stone, with Bath stone dressings and tiled roof, the edifice will be a pleasing building when completed. At present the erection of only the nave and a side aisle, to accommodate 250 persons, is being proceeded with, in accordance with the plans of the architect, Mr. C. H. Mileham, of London. The cost is upwards of 3,000*l.*

THE Charity Commissioners have approved the plans for six almshouses to be erected in two blocks on the land now

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occupied by the present buildings at Walton, and the contract for the first three has been secured by Messrs. Willis & Pickenson, of Weybridge, who will start work on Monday. Whereas the existing almshouses consist of only one room each, the new cottages will contain a living-room and a bedroom with the necessary offices, all, however, on the ground floor. There will still remain of the acre of land which the estate consists sufficient ground for the erection of the proposed cottage hospital should the Commissioners give their consent, or which they have been asked, to a portion of the land being let on lease by the trustees for that purpose. With regard to the present almshouses, of which there are ten in a single block, these will not be interfered with until death removes their occupants, who will continue to be made as comfortable as possible. Two houses, however, are already empty, the nine inmates living in the remaining eight. Under the terms of an order made by the Charity Commissioners in 1896 the trustees are compelled immediately to reduce the number of almspeople to six. But nothing will be done until there remain only five of the present nine inmates. Then a vacancy will be declared, and the new occupant will reside in one of the cottages now being built. When another inmate dies his or her successor will also be given a new cottage, and so on until all six are filled. But so long as they live the present inmates will not be disturbed from the possession of their existing domiciles, and until the new cottages are required for almspeople they will be let by the trustees to ordinary tenants, the rents going to swell the funds of the charity. When all the present houses are vacated the block will be pulled down.

THE memorial-stone of the church of St. Agnes, the latteridge, King's Norton, was laid on Saturday, the ceremony being performed by the Viscountess Cobham. The designs for the church provide for a massive tower at the west end, but the upper portion of this, however, is not included in the builder's contract of 8,600*l.*, and it is hoped that the necessary additional sum of 450*l.* will speedily be forthcoming. In style the structure will be a free modern adaptation of the order of architecture prevailing at the end of the fourteenth century, and the materials used will be red Leicester bricks for external and internal facings, with external details in Doulton's grey buff terra-cotta, and internal details in Quarella stone of a soft green colour. The roofs will be covered with green slates. The plan shows a chancel with flatly-canted apsidal end, out of which the organ chamber opens on the north side; a nave of five wide bays;

north and south aisles and transepts, the latter with a seating capacity of eighty-one being used as a morning chapel. It is intended that the tower at the west end shall have a belfry for six bells, the lower storey forming a large porch. There will also be other porches at the west end of the north aisle and to the morning chapel. A corridor flanking the south side of the chancel will give direct access to the mission-room at the back of the church, in which are situated clergy and choir vestries, and this passage, by means of a small archway from the chancel, will also serve as a return way for communicants. The church will be very amply lighted, the nave having a clerestory with two windows of two lights in each bay, and there are to be coupled windows of one light in each bay of the aisles. The chancel will have a five-light window in the centre and smaller ones on either side. The principal feature of the large west-end gable will be a very fine window of nine lights in elaborate tracery. The church will have a seating capacity for 700, exclusive of clergy and choir. The heating will be by means of a very thorough system of low-pressure hot-water pipes and radiators. Messrs. Cossins, Peacock & Bewlay are the architects.

### ELECTRIC NOTES.

THE Bolton electricity committee have requested Mr. G. Temperley, architect, to prepare plans for an extension of the engine and boiler-houses at the electricity works. Messrs. S. Talbot & Co.'s tender was accepted for boiler seatings and economiser chamber at the works, that of Messrs. J. & E. Wood for supply of iron brackets for cable trench, and that of Messrs. Nalder Bros. & Thompson for an ammeter.

A SPECIAL meeting of the Holyhead Urban Council was held on the 26th ult. to receive an estimate of the probable cost of the electric-lighting scheme for the town. Mr. Pryce White, the engineer, estimated the cost at 16,000*l.*, with 750*l.* for emergencies. It was resolved to purchase the existing steam mills at a cost of 3,000*l.*, subject to the approval of the Local Government Board, as a site for carrying out the scheme of lighting the town with electricity.

APPLICATION is to be made to the Local Government Board by the Wallasey gas and electricity committee for power to borrow the sum of 52,350*l.* for providing for the requirements of electricity works up to the year 1910. This includes 1,140*l.* for 5,200 square yards of land in Seaview Road,

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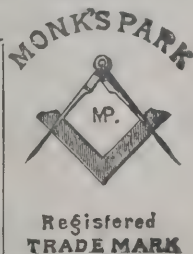
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THE streets of Airdrie were on Monday evening lit with electricity for the first time. In presence of a large gathering at the distributing station in Craig Street the ceremony was performed of turning on the new light. Bailie Ewart, convener of the lighting committee, presided, and stated that four years ago the Council got a provisional order empowering them to light the streets with electricity. Eighteen months ago the Scottish House Electricity Company, who have works in Coatbridge, took over the order, but did not begin till a few months ago to lay down the cables. Since then they had left no stone unturned to have the light switched at this the beginning of the lighting season. The electricity is generated at the company's works in Coatbridge, which burgh is also partially lit by them. In Airdrie, where there will also be a number of gas lamps retained, the electric installation consists, for the present, of ten arc and over a hundred 16 candle-power incandescent glow lamps.

### TRADE NOTES.

SYNOD HALL, Londonderry, is being warmed and ventilated by Messrs. John King, Ltd., engineers, Liverpool, who are employing their latest improved system of combined warming and ventilation.

To commemorate the Coronation of H.M. King Edward VII. a new large-size turret-clock showing the time upon one large external dial, painted and gilt and fixed at the top of the tower, was set going at Leven parish church, Skirlaugh, Hull, on Saturday last, the chairman and chief promoter of above being Mr. Wm. Bethell, of Rise Hall, near Hull, a nephew of Lord Grimthorpe, from whose design the clock was made and fixed by Wm. Potts & Sons, clock manufacturers, of Guildford Street, Leeds, who on the same day fixed a large clock at the new Council offices, Annfield Plain, co. Durham, to commemorate the long and useful reign of H.M. the late Queen Victoria.

### VARIETIES.

A NEW cottage hospital was opened at St. Andrews, N.B., on the 27th ult.

ON Sunday the New Jerusalem Church, Moorside Road, Swinton, was reopened, after extensive alterations.

THE newly rebuilt St. James's schools, Brighouse, which were destroyed by fire a few months ago, were opened on Saturday afternoon. The new buildings provide accommodation for two departments, mixed and infants. They have cost 1,400*l.*

THE new Grove school, Hanley, Staffs, which is to provide accommodation for a portion of the Northwood district, was opened on the 25th ult. The new building has cost nearly 10,000*l.*, and will afford accommodation for 670 boys and girls, so that with the older portion room is provided for 1,000. The building has been erected by Messrs. Tompkinson & Bettelley, of Longton, under the superintendence of the architect of the board, Mr. E. E. Scrivener, of the firm of Scrivener & Sons, Hanley.

AN interesting discovery of prehistoric remains has been made at the fishing village of Ambleteuse, near Calais, by Professor Dharvent, of the Anthropological Society of Paris. In connection with works of sea defence the removal of sand on the dunes at Ambleteuse was being carried out to a depth of 20 feet, and this revealed the presence of an ancient soil with many evidences of prehistoric man. Further excavation under Professor Dharvent proves this to be one of the most important neolithic stations yet discovered. It is more than 150 yards square, and includes what was undoubtedly a large workshop for the making of flint swords, knives, arrow and javelin heads, &c., numbers of which were found. Professor Dharvent says the discoveries show this was the home of a prehistoric people who knew the use of fire, lived in huts on fishing and the chase, and made their weapons from the silex at hand on the shore.

AT Sittingbourne on the 28th ult. considerable interest was taken in the opening of a new Roman Catholic church. The Church of the Sacred Heart, as it is called, is a Gothic building with a very imposing façade. It is adjacent to the main road and is situated at the west end of the town. The building is constructed of specially selected bricks, and Bath stone has been freely used in the fabric. The woodwork is of oak, and the Early English type of architecture has been rigidly adhered

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AISLE. THE HIGH ALTAR.

throughout. A niche over the handsome main entrance to the church contains a statue of the Redeemer with His Cross. On either side are statues of St. Augustine and Thomas à Becket, and over the arch between the church and the presbytery is a fine statue of St. Michael vanquishing the dragon. The altar is beautifully carved in Sicilian marble. The present front of the building, which was designed by Mr. W. Leonard Skes, of Sittingbourne, is 4,300*l*.

BEVERLEY, which has long felt the need of a good secondary school, has at length had its longings realised, and the new grammar school in Queen's Gate will be found a proper provision for the future in the shape of up-to-date laboratories, science lecture-room and workshop, and a large capable staff of masters. The new buildings of this ancient foundation, which were opened on Friday last, have been erected on the west side of Queen's Gate on a site which stretches westward towards Westwood. The principal entrance to the grammar school leads to a central corridor, on either side of which are three classrooms 121½ feet by 20 feet, which will each accommodate twenty-four boys with single desks. Two of the classrooms are divided by movable partitions, so that they can be converted into one large room. Near the entrance is the masters' room and on the other side of the corridor is a large cloak-room and lavatory, near the former being an entrance from the playground. At the north end of the building are rooms to be devoted to science teaching, with a laboratory 30 feet by 22 feet, and lecture-room. The south end of the building is planned so that the central hall and further classrooms can be added when extensions are required. The rooms are well lighted from the left side and the heating and ventilation are supplied on the latest principles. The exterior is simply treated in red brick with stone dressing, and the roofs covered with red tiles. Over the entrance is a carved

panel bearing the arms attributed to the Minster, with which the grammar school was connected for seven centuries, and the arms of Beverley, with the motto of the school, "Haec studia adolescentiam alunt, senectutem oblectant." The work has been carried out under the supervision of the architect, Mr. J. Bilson, F.S.A., of Hull.

THE IRON AND STEEL INSTITUTE.

A MEETING of the Iron and Steel Institute was opened in Düsseldorf on Wednesday. Governor von Hollenfer welcomed the delegates in the name of the Government. He said:—As twenty-two years ago, so now, an industrial exhibition in Rhenish Westphalia has caused the Iron and Steel Institute to hold its meeting in Düsseldorf. We are extremely pleased and honoured thereby, as the Institute is without question in the front rank and before all other associations whose object it is to promote scientific knowledge and discovery. Born in England, the Iron and Steel Institute gradually acquired international importance. Now men celebrated in science and in its application join hands to place their knowledge at the service of the Institute, whose progress is of the greatest importance to all civilised peoples. I consider that the development of the steel and iron industry forms an index of a nation's economic culture. We therefore hope that the industries of all countries may derive benefit from these discussions. With the wish that your visit to Düsseldorf may be a pleasant one, and that you may retain an agreeable remembrance of your reception, I bid you once more, in the name of the Government, a hearty welcome.

Herr Feistel, the second burgomaster of Düsseldorf, then greeted the delegates, saying:—

I had the honour of greeting the Iron and Steel Institute at Düsseldorf twenty-two years ago. I am highly honoured that the office falls upon me again. At that date Düsseldorf had 90,000 inhabitants, and was suffering from the depression following on the war of 1870. Now it counts 230,000, and boasts of a highly developed iron industry. In 1880, despite its position hard by the Rhine, Düsseldorf had no proper economic connection with that proud stream. Although much has changed, one thing has not, and that is that you are the same welcome guests now as then. We hope you may feel yourselves particularly at home among us, as we have in our midst experts with whom you can

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exchange opinions on all subjects dealing with the iron and steel industry. But the visit of foreign associations, consisting of owners and of managers of great works, men of experience and knowledge, possesses a significance exceeding the limits of a purely expert nature. These international meetings offer an opportunity for free discussion on all subjects of conversation; the power of the spoken word takes the place of the written one, so often misunderstood. Such conversations call forth intellectual currents which transcend political confines, and with the proverb "Knowledge is power" give an ever-increasing practical importance to them, thus bringing peoples closer together and rendering unpleasant meetings between them ever rarer. As the political representative of Düsseldorf I bid you all welcome, and hope that this meeting of the Iron and Steel Institute may give the best results in all directions.

The president of the Association of German Iron Men, Privy Councillor Lüg, followed:—

I welcome you all most cordially in the name of the German iron and steel industry. As President of the Rhenish-Westphalian Exhibition of Industry, Trade and Art I rejoice to see you in such numbers. You will find in the exhibition the results of our industry, which are open to your criticisms, and I hope you will freely criticise what you see. These criticisms will be all the more welcome to us as they emanate from a quarter which, as regards the manufacture of iron and steel, we recognise as in many respects our masters. In 1880 you criticised our exhibits favourably. I hope you will find things which will interest and instruct you, and that you may take away a very pleasant recollection of your visit.

Mr. Whitwell, the president of the Iron and Steel Institute, responding, said:—I rise with extreme pleasure to respond to the kind and hearty welcome which has been accorded us here to-day. I am sure our friends in Düsseldorf have no idea of the sympathy created in England by the invitation to visit Düsseldorf. It does not seem long since we last met here, but how much has occurred in the space of time. It has given me much pleasure to hear a member of the Government welcoming us in so cordial a manner. It is with exceeding pleasure that I see you assembled here together. These meetings bring young members together. We have come here to learn and to see a great deal which is not only of interest, but which will instruct us wonderfully. It is many years since I came here. We have visited many countries together and striven to enlighten young members. At this exhibition everything will be explained. I feel extreme

gratification in the thought that the young members will return enlightened and with the stimulus for fresh endeavour. We are keenly alive to the importance of education and to the greatness of Germany, with whom we have the greatest sympathy. It will be our own fault if we do not take advantage of the splendid opportunity here offered us and learn as much as possible, so that we may tell our friends on our return how much we have enjoyed and benefited by our visit.

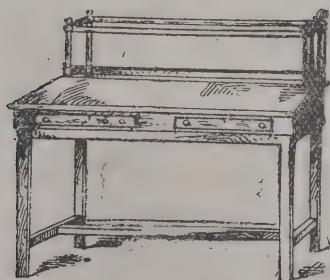
The President also announced that Mr. Andrew Carnegie had been elected president for next year and had accepted the office.

### GLASGOW ARCHÆOLOGICAL SOCIETY.

The members of this Society visited Dumfries on Tuesday and drove to Lin-Cluden Abbey and afterwards to New Abbey. At the former place Mr. Whitelaw, architect, read a paper on the history and architecture of the abbey and Mr. Barbour, Dumfries, supplemented the information which it conveyed. The remains of the abbey church, consisting chiefly of the choir, excited the admiration of the visitors from the richness of its architectural detail, and Mr. Dalrymple, of Meiklewood, the hon. secretary, characterised it as one of the most interesting buildings he had ever seen. The configuration of the adjoining ground at the confluence of the Nith and the Cluden excited speculation as to whether the conical mound is the ancient moat and the square embanked lawn its base court, and that the builders of the abbey had availed themselves of those features in laying-out its garden or pleasure grounds. At New Abbey the Rev. Dr. Wilson gave a very interesting account of the venerable building associated with the name of the Lady Devorgilla. Luncheon was served in the Station hotel at Dumfries. Mr. George Neilson, vice-president of the Society, presided, and Provost Glover, one of the guests, proposed the toast of success to the Society.

### FIREPROOF MATERIAL.

H.M.S. *Good Hope*, one of the new great armoured cruisers fitted with non-flammable wood, is to be completed this month and further experience of this material, which has been the subject of so much controversy, will be watched with some interest. The flame-resisting qualities of non-flammable wood are universally admitted, but complaints, it will be remembered were made in the case of H.M. new yacht *Victoria and Albert*.



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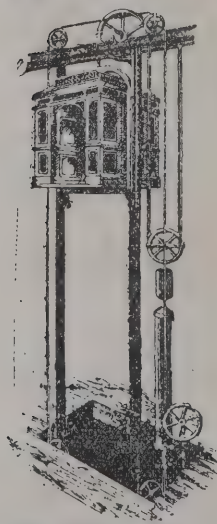
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its effect upon paint. It is only fair to mention that the company's contention as to the wood supplied to the yacht has been exposed to rain at Pembroke and fitted on board in damp state, contrary to their instructions in regard to it, confirmed by later results, for after the paint had been scraped off, the wood thoroughly dried, and afterwards repainted in the ordinary way, it was found to be perfectly satisfactory. When it is remembered that there is over 600 tons of this vessel the importance of this will be realised. An interesting experiment has just been concluded after eighteen months' test in regard to the alleged complaint of the effect of flammable wood upon the bullion and officers' clothing stored in chests made of this material. To settle the matter the Admiral Superintendent at Portsmouth Dockyard had two chests of drawers made, one of ordinary timber and the other of non-flammable wood. Clothing, with the gold lace, was placed in each of these chests, which were put in the Admiral Superintendent's office, and the drawers sealed. After an interval of eighteen months the drawers have now been opened, with the result that the clothing and lace in the treated wood chest have been found in the same satisfactory condition as in the ordinary wood drawers. The test is to be continued in a vessel at sea, but in the meanwhile it may be of interest to mention that the officers of the United States cruiser *Illinois*—lately at Portsmouth for the Coronation Review—state that they have no complaint whatever to make of the non-flammable wood on board their vessel.

Properly worked and managed, there is no doubt whatever that non-flammable wood will become very largely used by architects and the building trades generally, as it is quite apparent that more attention in future must be given to the use of reproof materials, owing to the increase in the outbreak of fires, and the severity of the fires to which we have recently had to give attention.

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CONSOLIDATION of the above companies has been effected, and the joint business will in future be carried on under the name of "Waygood & Otis, Ltd."

The name of Waygood has been prominently associated with hydraulic lift and hoistwork for the last half century, while the Otis Company claims the credit of having introduced and

popularised the electric lift in Great Britain. It is no exaggeration to say that a very large portion of the lift business in this country has been carried out by these two firms, and that the more responsible and exacting class of work, such as installations in the Royal palaces, Government offices, public institutions and leading hotels has been largely entrusted to one or other of them.

The following may be mentioned as a few of the lift installations recently carried out by one or other of these companies:—

Buckingham Palace; Bank of England; the Colonial and India Offices; the Royal Stands, Ascot; the Speaker's residence, House of Commons; the Institution of Mechanical Engineers; the Surveyors' Institute; Central London Railway; Salisbury House.

With reference to crane and hoistwork installations have been carried out for the following:—

Bellamy's wharf, Fresh wharf, Gun and Shot wharf, Hay's wharf, Kennett's wharf, Mark Brown's wharf, Lancashire and Yorkshire Railway, London, Brighton and South Coast Railway, London and North-Western Railway, London and South-Western Railway, South-Eastern and Chatham Railway, &c., &c.

The consideration which, we are informed, determined the directors and shareholders of both companies in favour of fusion of the two businesses is that each party is able to supplement the other in important respects, the Waygood Company possessing excellent manufacturing facilities, while the Otis Company controls for the British Empire and Europe the patents, designs, and wide experience of the Otis Elevator Company of the United States of America. The British and American Otis Companies are quite distinct organisations, possessing only the name in common; but the British company is not only the proprietor of the American company's patents in its territories, but has the immense resources of the latter at its back.

The new company, Waygood & Otis, Ltd., will thus become possessed of the patents, designs and experience of the Otis Company, U.S.A., in addition to the manufacturing facilities of R. Waygood & Co., and be enabled to undertake the construction and installation of lifts, cranes and hoisting machinery on lines of approved standardised designs, insuring uniform quality; while the increased facilities for production following upon the joint requirements of the two businesses and future developments must lead to reduced cost of manufacture and of selling price to the public.

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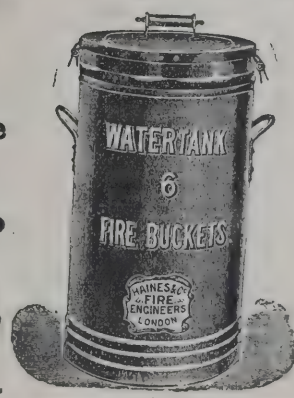
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There is rightly in this country a disposition to look with suspicion upon consolidations of businesses. But it is proper to discriminate between "combines" brought about for the purpose either of bolstering up decaying businesses or of "cornering" a trade or public necessity, and consolidations effected with the object of cheapening manufacture and assuring high and uniform quality of product. In the case of the Otis and Waygood Companies the fusion is that of two successful concerns returning steady dividends to their shareholders, and has for its object the creation of an organisation capable of effectively dealing with the increasing demands of, and the heavier engineering problems before, the lift industry.

Waygood & Otis, Ltd., will continue the manufacture of lifts and hoisting machinery in London, as heretofore carried on by Waygood & Co. at their works in Southwark; but it is claimed that the new company will have the additional benefit of the American Company's design and workshop experience to assist it in maintaining its factory and products at the highest level as to quality and cost of production.

Mr. H. C. Walker, chairman and managing director of R. Waygood & Co., will be chairman, and together with Mr. R. Percy Sellon, M.I.E.E., managing director of the Otis Elevator Company, Ltd., will act as joint managing director of Waygood & Otis, Ltd.

### EXPERIMENTS WITH FIREPROOFED WOOD.

A SERIES of tests of wood treated with various fireproofing processes was carried out recently at the Massachusetts Institute of Technology under the direction of the new Insurance Engineering Experiment Station. According to the *New York Times*, in general a temperature of thirty-five hundred degrees Fahrenheit seems to have reduced both treated and untreated wood to charcoal rapidly and easily, both of them blazing while exposed to the heat, although the treated wood ceased to blaze in a few seconds after being removed from the furnace, while untreated wood continued to flame for several minutes. In another experiment, intended to test the comparative resistance of the two kinds of wood to this temperature, it was found that it took about a minute longer to reduce the treated wood to charcoal than the untreated wood. At lower temperatures the fireproofing treatment appeared to be more effective. At eighteen hundred

degrees Fahrenheit both the treated and untreated wood blazed and were reduced to charcoal; but when simply dropped on a red-hot iron plate the pieces of treated wood merely charred at the point of contact, while untreated wood blazed up and was consumed. In the final experiment a block-house was built of pieces of each kind of wood and subjected to fire for five minutes. The treated wood burned where more exposed to the fire, but not readily, resisting for ten minutes before it fell, while the untreated blocks blazed up, and the structure fell in five minutes. In this test different samples fireproofed wood were used together, and it was observed that some samples resisted the fire longer than others; but the *Times* reporter says that some sticks simply painted with fireproof paint "withstood the flame fully as well as the wood treated to a fireproofing solution which soaked through the entire stick." In regard to the question whether the fireproofing imparts any objectionable quality to wood, Professor Norton, the director of the experiment station, said that he had found the treated wood much more injurious to tools than untreated wood, both because it was harder and on account of some chemical action of the fireproofing solution on the steel which caused the tools to rust very quickly.

### HYGIENE IN SCHOOLS.

At the late congress of the Institute of Public Health a paper was read by Mr. C. W. Bracker on "Practical Hygiene in Elementary Schools," in which he referred to the introduction of hygiene as a subject. He considered "that definite instruction should be given to all children in the senior departments of all elementary schools in the principles of hygiene."

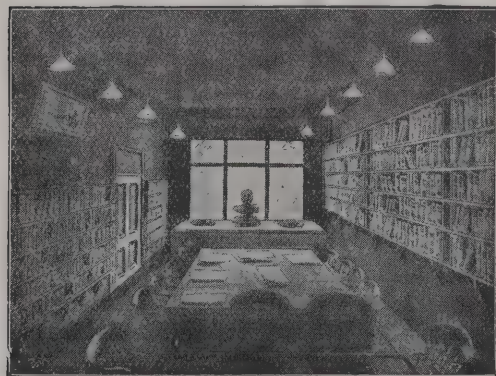
In the syllabus for the 1903 examination for "acting teachers, the Board of Education have incorporated the following under the head of school method:—Ventilation, heating and temperature.

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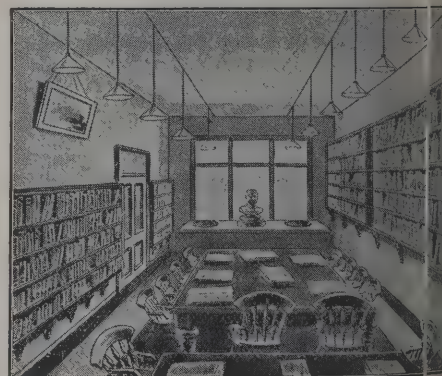
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laws which govern the movement of air and by the action of the powerful natural forces which are ever ready to hand and unceasingly in action. The method shown on the diagram is given as an example of the general arrangement of natural ventilation as applied to buildings, and as evidence of its success, as the people, both the old and the young, must win object lesson of tried utility, the advantages of which have been proved beyond a doubt, to fix their attention and conviction to their minds. The people are not theorists, theories alone appeal to, or make any appreciable impression upon them. The diagrams are issued at the present commemoration of the Coronation of the King, and also the jubilee of the scientific application of natural ventilation a complete system, developed fifty years ago by the late Robert Boyle, sen., in conjunction with Professor Michael Faraday—with whom he was a co-worker—and has since been brought to a high state of perfection as the result of a fuller knowledge of the natural laws which govern ventilation.

## SURVEYING IN CENTRAL AMERICA.

of the engineers most actively engaged on the survey in Central America to furnish information concerning the practicability of various ship-canal routes since 1888. N. Boyd Ehle, who has a paper on the problems and methods of the Isthmian canal surveys in the "Transactions of the Association of Civil Engineers of Cornell University." The organisation of the engineering department had a chief engineer at the head, under whom were senior and assistant engineers. The latter were in charge of the work in fieldwork or a section of construction. A survey party had two instrument-men, a level rod-man, two chain-men, a helper and about eight machete-men as a minimum. In the new country the assistant engineer was supposed to scout the way ahead of the instrumental survey, using hand instrument and perhaps pacing distances. To get the best results a theodolite was used and a chart giving the pacing reduction for various slopes. With a small protractor it was possible to make a map and sketch in the topography. A machete was, of course, the most essential part of the outfit, without which progress was well nigh impossible. Such valuable information could be easily and quickly obtained by these preliminary examinations, and if results

justified a detail survey, a compass or transit lines with levels would be run through paths cut by the machete-men and the line cross-sectioned for a considerable distance on each side, so that in case of a probable canal location this could be projected on the map. Usually the fieldwork was mapped out on a scale of 400 feet to an inch and 10 feet contours, but in the more important work at the lock and dam sites, 100 feet or 50 feet to an inch was used. The topography of large tracts was thus developed in order to cover thoroughly the area of comparative feasibility. No comprehensive idea of the whole problem could be secured except from maps, for the fieldwork was somewhat like surveying in the dark, as far as the physical characteristics adjacent to the line were concerned.

There was, however, a great difference in the amount and character of the work of the various assistant engineers, due, Mr. Ehle says, both to method and energy displayed. A certain man seeking out a ridge or canal location would try to make a checker-board survey of the whole country in question and pick out his results on a map, while another would carefully scout out the work on the ground and direct the survey at once to the desired results. The latter was the more valuable man, but it required greater physical energy on his part. Often an assistant engineer simply kept his men at work while he remained in camp, ran the party, and submitted the results.

In the surveys of the impounding ridges for the basins it was considered best to determine the general direction and follow that compass course until it ran off the heights into a watercourse, and then offset back up a branch to the divide again and start over.

In a canal survey it is important to get the shortest distance with the least elevations, and this usually led into valleys and swamps where the work was disagreeable, difficult and unhealthy, not to mention the attention of the myriads of mosquitoes and other insect pests. Transit location surveys never averaged one-half mile a day, while compass and cross-section work usually averaged less than 5,000 feet per day, with a maximum of about 8,000 feet per day.

In a river survey, stadia methods were used for fixing the points along the bank, and the soundings located from these by the stadia or sextant. With the sextant the boat was usually run on a range and the soundings taken at time intervals. The line was assumed straight between the sextant observations, which is only possible in still water. With the stadia it is possible to locate each point more quickly and accurately.

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Stadia or gradient methods were of little use in the forests, and the chain was usually depended on for distances. Triangulation surveys were used on Lake Nicaragua, but were not effective on the San Juan or other rivers on account of the great difficulty of clearing out the overhanging trees along the banks.

In a reconnaissance along the coast of Darien two sextants were used to establish the position and elevation of points on the distant mountain range and the contour sketched. The distance between the observers was determined by observation on the mast of a ship. The results, although somewhat crude, answered the purpose, and were secured very quickly and cheaply.

In the investigation for foundations and classifications of material various methods were used. The earth auger was the most simple and least satisfactory, as it was difficult to manage at any great depths, and when stone was reached it was the limit of the boring and in no wise conclusive that this indicated rock in place.

The Pierce machine, with its facilities for driving, casing and washing up light materials, succeeded the common earth auger. With this when stone was reached it was customary to lower sticks of dynamite and explode them by an electric battery, which usually was sufficient to displace ordinary boulders. If this was not effective the diamond drill was used to get deeper and obtain a core of the material. On the Panama Canal deep test pits were used, and even a tunnel to determine the substrata.

The various classifications of material were obtained from samples preserved by the boring foreman in small bottles of earth, or of rock by taking a section of the core. These were labelled with the location of the hole and depth in feet at which they were taken, and shipped to headquarters for use in classifying the material on the cross sections for estimates or determining questions of foundations.

Gauging stations were established at important points on the various canal routes and around the watershed of the water supply for the summit level. The observers were required to keep a careful record of the rain gauge, river gauge and thermometer, also to make gaugings of streams with the current meters. Sediment observations were also conducted on the more important streams by lowering a sediment box and ascertaining the quantity of material moved in a certain period. Current meters were rated by moving them at uniform velocity in still water and plotting the results as a curve. The metre

was then used with a boat that was anchored at points along the cross-section of a stream, if this was possible. It was sometimes necessary in large rivers in flood to rig a cable across the stream. On this was hung a car from which the observer used his metre. The results of the rain gauge observations were plotted to give zones of rainfall, which were variously coloured. These data and the river gauging operations were necessary in the very extended computations to ascertain the sufficiency of water for the lockage, and also the proper measures to be taken to regulate the floods.

The camps were usually sheds with a roof of palm leaves which were lapped similar to shingling; side walls were not necessary. Canvas tents were not a success, as they were soon ruined by the mildew of the damp climate of the rainy season. The beds were of a piece of canvas with poles through the side loops, and raised on crotched sticks. The kitchen arrangements were very simple; crotched sticks with a cross-bar were used to hang the kettle over the fire, or sometimes a rough fireplace of large stones took the place of this.

In the rainy season it was first the custom to attempt to dry wet clothes with Sibley stoves; but after several dry houses were burnt with their contents this was not in favour; it was found that no ill effects were experienced from wet clothes, although it was not unalloyed pleasure to get out of wet blankets into cold wet clothes. In the evening, on returning from work, it was customary to take off wet clothes, have a bath and get into pyjamas. In mosquito infested camps, this was followed by getting under the mosquito bars as soon as possible after supper. It was sometimes necessary to do outdoor work under mosquito bars.

The officework in the field was usually somewhat crudely done, merely to verify the accuracy of the work and its completeness. Duplicate copies of notes were made and sent to the division or chief engineer's office. At headquarters the fieldwork of the various parties was combined into large contour maps somewhat elaborately drawn. On these large contour maps the various projects were laid out and studied. A paper location would often be sent to an assistant engineer to be run out and verified. When all the data were in, estimates were made by taking cross-section notes from the maps, plotting these with the classification of material obtained from the boring notes, and obtaining the yardage by the planimeter measurement. Maps were plotted and surveys adjusted by the method of latitudes and departures. Courses were generally referred to the true meridian in transitwork, checking thence

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middle course. From star observations it was possible to find the co-ordinates for the maps. Longitude was obtained by using chronometers from Panama, which had been very accurately located by direct observation as a primary point by such astronomical expedition. By means of these map co-ordinates it was possible to make the new work on small-scale maps with those of the survey and other expeditions. For this work the large maps were pantographed down; usually each set of maps was reduced one-fourth, although this was not strictly adhered to. The Darien survey the field maps were 1/12000, the general map a route 1/60000, and the general map of all the routes 1/100000. The general map of the Panama route was made on a scale of 1/10000; the profile had a similar horizontal scale with a vertical scale of 1/506880, the sheets of general topography 1/19200, and the detail topography 1/19200; on these latter were placed the boring records. Plans of structures were made 1/480, 1/960 or 1/100, as was necessary to show

have no doubt are being injured in the same way. These bridges are of the greatest historical interest, and are picturesque in the highest degree; but most certainly if left to the tender mercies of the county councils their destruction sooner or later is inevitable, hideous iron and steel constructions taking their places.

That the preservation of beauty on the river and its banks is within the province of the Thames Conservancy seems to be implied by the enactment of their by-laws relating to birds and wild flowers; and it is devoutly to be hoped that they will in the present instance see their way to putting a check upon the hasty and ill-considered proceedings of the Oxfordshire County Council.—I am, Sir, faithfully yours,

Riverside, Wallingford.

G. D. LESLIE.

Sir,—The clear statement of your correspondent as to the facts connected with the resolution passed by the County Council of Oxford on August 9 gives a clue to the manner in which the public are so often taken by surprise when it is already too late to frustrate vandalism in the destruction of the features of lovable scenery.

The appreciation which you show in your leader of the influence of a beautiful river upon its people must be of sterling value to reflective minds. The nation, without doubt, is in serious danger of losing faith in the testimony of our poets and painters to the exceptional beauty of the land which has inspired them. The poets, from Chaucer to the last of his true British successors, with one voice enlarge on the overflowing sweetness of England, her hills and dales, her pastures with bright flowers and the loveliness of her silver streams.

The havoc wrought upon true beauty in recent times is ever committed in the name of utility; the last undoubtedly demands its proper place, but without the sanctification of art (greed and naked practical wants alone satisfied) our habitation would be left to us desolate, and then the commercial prosperity, which the utilitarians alone consider, would itself be affected.

It is the cherishing of the wholesome enjoyments of daily life that has implanted in the sons of England love of home, goodness of nature and sweet reasonableness, and has given strength to the thews and sinews of her children, enabling them to defend her land, her principles and her prosperity.

It is necessary thus to enlarge upon the substantial services of art to the nation, since these are daily ignored.

With regard to the three Sonning bridges, the reconstruction

## SONNING BRIDGES.

Following letters on the proposed renewal of the bridges have appeared in the *Times* :—

“Every lover of our beautiful river will, I feel sure, be led to you, sir, and to your correspondent for calling attention to the act of vandalism which the County Council of Oxfordshire have decided on perpetrating, in replacing the old bridges at Sonning by structures of steel and iron. The question of the preservation, or at least of the artistic reconstruction, of these and the other old bridges on the upper Thames has latterly become a very important one. For all ordinary traffic these old bridges, with occasional repairs, would be sufficient; but one after another they must certainly contribute to the enormous strain imposed upon them by the traction engines; these ponderous machines and the weight which they draw are, with very few exceptions, concentrated without springs, the result of which is that the impact falls vertically on the bridge, like the blows of a hammer, as the wheels jolt over the various irregularities of the roadway. Our old stone bridge at Wallingford is, according to expert evidence lately obtained, slowly splitting in two from this very cause; the bridges at Radcot, Abingdon, and Shillingford, with St. John's and New Bridge, I

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tion of which is contemplated, parts of them have already been gradually rebuilt with iron fittings in recent years, and no disinterested reasonable person can see why they could not be easily made sufficient to carry all existing traffic. If the bridges were to be widened in the service of some disproportionate vehicles, it is obvious that the traffic such enlarged bridges are intended to carry would be put forward as an argument for demolishing the exquisite old bridge over the main river which is the glory of this exceptionally picturesque and well-ordered village; and this is a matter of which even the most utilitarian would soon see the evil in the diminished attraction of the river not only to Englishmen, but to Colonials and Americans who have across the sea read widely of its beauty.

Remonstrance must look ahead, and can only now be of avail in recognition of future further danger. We on our side of the river have, I believe, nothing to do with the money cost, and therefore it may be urged that we have no right to interfere; but the population on the near Oxford side is small. On the Berks side are the people immediately concerned in the beauty of the neighbourhood, and we are called upon to plead the cause for the whole of beauty-loving England, and of all river-loving people in particular.

As you point out, our right is purely a moral one, but as matters stand at present equity has been grossly violated by the fact that the plans have never yet been made public.

Before any further step is taken we claim that full plans and elevations should be submitted to public opinion, represented in Sonning by a committee now forming. Surely this is no extravagant demand. The matter calls for urgent public attention.—I am sir, yours truly,

W. HOLMAN HUNT.

Sir,—The roads and bridges committee of the Oxfordshire County Council would have neglected their duty if they had not insisted on the necessity of preparing new foundations for the bridges at Sonning before the period of floods if the risk of a serious disaster was to be avoided. They were wrong in not submitting the design of the superstructure to the inspection of the Council. If they had done so I believe the opposition of the Earl of Jersey and others, and the hesitation of members who, like myself, did not vote, would not have arisen. I saw the design after the meeting. The bridges are lattice girders, which the strength of the material (steel) permits to be light and elegant in appearance. Since the meeting I have seen several similar structures in situ in Sutherlandshire, and

I feel certain that those who are properly jealous that no structure shall be permitted which will be detrimental to the beauty of the Thames Valley may dismiss their fears.

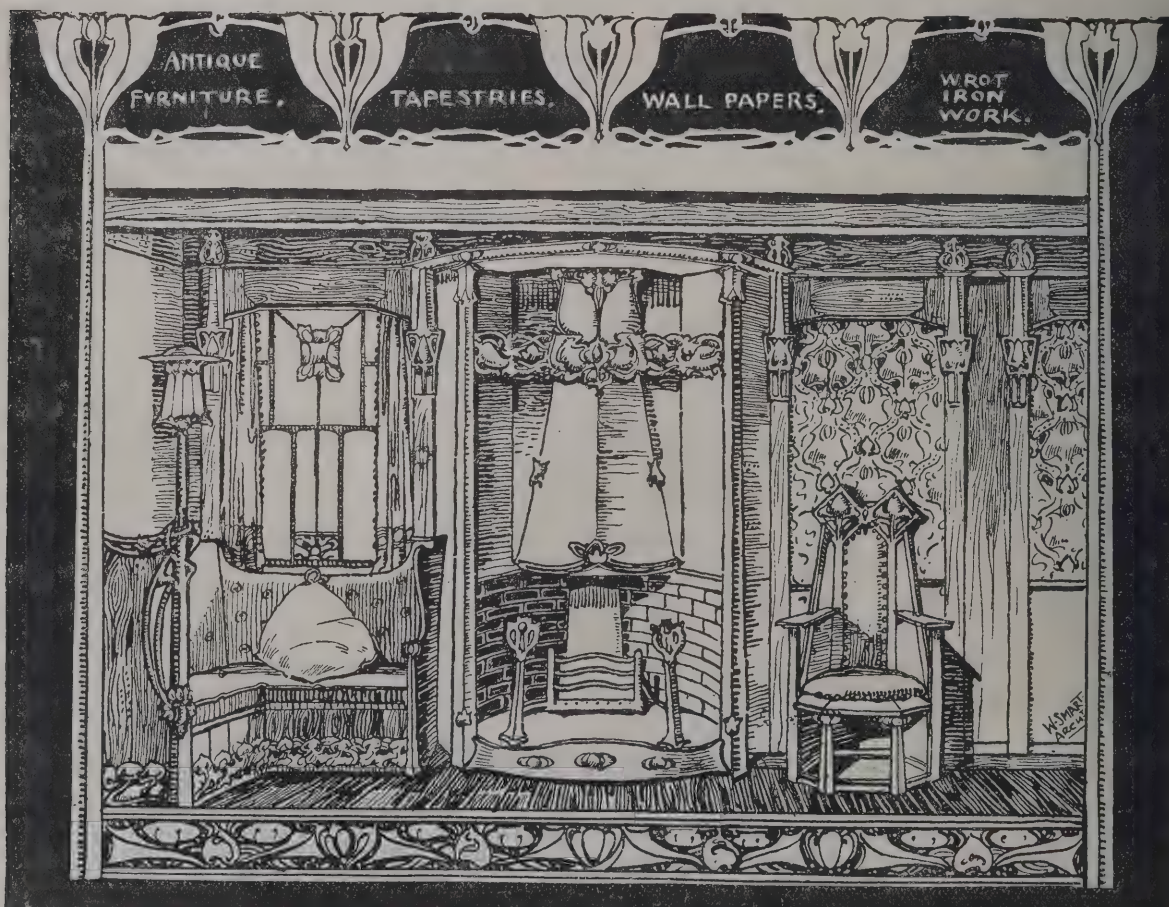
The Council defer to the authority of their chairman, Mr. Valentia, and are always sorry when his political duties deprive them of his presence, but he will be the first to say that, with his political duties compel him to be absent, he could not be replaced by a more competent substitute than Mr. Cobb. Your obedient servant,

A MEMBER OF THE OXFORDSHIRE COUNTY COUNCIL

### THE HOUSING PROBLEM.

THE committee appointed by the two Houses of Parliament in March last to consider the standing orders relating to houses occupied by persons of the labouring classes have rendered their report. With regard to the Metropolis, they recommend that every case in which houses of the labouring classes are proposed to be taken shall be notified to the central authority, while outside London it will be sufficient if the attention of the central authority be called to cases in which thirty persons of the working class are displaced. In settling schemes for providing new houses in place of those demolished, they would give the central authority full discretion. The committee recommend that the new houses to be provided be suitable for persons of the labouring class, and not of an ambitious in character and design; and to these conditions they attach much importance. They would leave wholly to the discretion of the central authority the selection of the area in which the new habitations are to be provided. "It may be, and we think will, be found expedient in some cases to erect houses at some considerable distance from the houses demolished, and not necessarily within the jurisdiction of the same local authority." Further, the committee recommend that in London the central authority be empowered to fix rents for the new dwellings, this decision having been arrived at on division by six votes to three.

The purport of the new model clause for London is to make it the duty of the company or local authority bringing forward any scheme to provide new and suitable dwellings for the persons displaced, and with this intent plans and necessary information must be submitted to the Secretary of State, who will, before issuing his certificate approving of any scheme,



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on it to the London County Council and any other local authority appearing to him to be concerned therein. If the person fails to furnish the memorandum required they will be liable to a penalty not exceeding 500l. Moreover, "If the person, without having obtained a certificate from the Secretary of State or his approval of a scheme, or in contravention of any provisions of any scheme, displace any persons of the working class from any house, or use for the purposes of undertaking any land in respect of which a housing obligation has arisen, they shall be liable to a penalty not exceeding 500l. in respect of every such house." The expression, "labourers" is defined to mean "mechanics, artisans, labourers, persons working for wages, hawkers, costermongers, persons working for wages but working at some trade or handicraft not employing others except members of their own family, persons other than domestic servants whose income does not exceed an average of 30s. a week, and the families of any persons who may be residing with them." In the clause relating to places outside London the approval of the Local Government Board is required.

In Mr. Troup's evidence reference was made to the possibility of removing factories from London into the country. The witness said:—I have here some figures which show to what extent it might be possible to relieve the congestion in London by the removal of factories to the country. The figures have been supplied by the Factory Department. I find that there are 748 factories in London employing more than 20 people—the total number employed in those factories is about 200,000. That, no doubt, would represent—taking one person, say, to each employé—a population of about 200,000 at the least.

Lord Lamington: Which London does this represent?—The county of London, the administrative county. In order to judge as to which classes of factories might be made the subject of removal to the country they are classified to a certain extent: for instance, there are fifty shoe makers' factories, thirty bread and biscuit factories, ten cabinetmaking factories, eleven factories making toys from fruit, sixteen breweries, forty-seven book-binding establishments, seventy-two printing establishments (including newspapers) and nineteen saw mills, and so on. I have ascertained that in those classes of factories there is already a very considerable tendency to remove them to the country. For instance, the very largest cabinetmakers in London have recently removed their houses to the country.

These figures are given merely to show that there is a considerable scope in the possible removal of factories from London to the country if that could be in any way under the scheme arranged with the railway companies or other companies. In reply to a further question, Mr. Troup said that personally he considered this the chief element in the solution of the working-class difficulty in London.

Dr. Manfield Robinson, town clerk of Shoreditch, explained to the committee how the high prices demanded for sites prevented the carrying out of housing schemes in the borough. Land was worth 20,000l. to 30,000l. per acre. That was what it cost to acquire the Morten Place area, and the large area of three or four acres called the Stonebridge estate would cost about the same amount, and that was in the northern part of Haggerston, the cheapest place for land in Shoreditch. Hence the local authorities had come to the conclusion that unless they could buy land more cheaply it would be impossible to build houses for the working-classes. The witness looked for relief to electric and other suburban railways. In his opinion the welfare of the children was the all-important matter. "The question of whether a man has to wait about for an hour when he comes to business owing to a train getting him there earlier than he wants is, in my opinion, most infinitesimal compared with the fact of his children having to spend twenty-four hours a day in the slums, in bad atmosphere and under bad conditions." The overcrowding abomination in East London was, he believed, far worse than in any other part of the country. Mr. E. J. Harper, statistical officer of the London County Council, was of opinion that that body should provide the housing accommodation at the expense in certain cases of railway companies and others. The Council had now on hand another of the new streets and improvement schemes, and if the suggestion were carried out, and they could spread the rehousing operations equally over London, he believed they would be able to save at least half a million of money.

#### GOVERNMENT IRON AND STEEL WORKS, JAPAN.

THE following report has been prepared by Mr. Ernest A. Griffiths, of the British Consular Service, on the Imperial Japanese Government Iron and Steel Works at Wakamatsu, in Kiushiu, formally opened on October 18, 1901:—

The necessity of rendering Japan independent of foreign

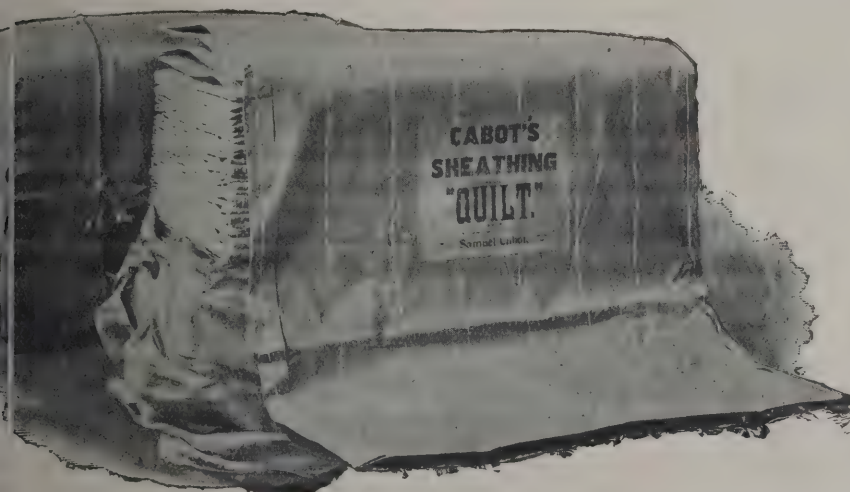
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countries for her supply of steel and iron manufactures by the establishment of a steel factory has for some years past been recognised in the country. It was not, however, until the year 1890 that anything definite was attempted, and even then, although the question was taken up by the naval authorities and an estimate submitted to the Diet, the attempt proved abortive.

Various reasons were at the time given for the failure of the Government scheme—one to the effect that sufficiently explicit information had not been given to the Diet by the Government as to the amount of iron ore and other raw material which Japan herself could supply to meet the needs of the foundry, another that there had been a difference of opinion on the question of control between the War and Navy Departments. Whatever the reason may have been the proposal was rejected by the House of Representatives. The Upper House, however, was not satisfied to let the matter rest there. It urged upon the Government the necessity for further action, and suggested as a preliminary step that a committee of inquiry and investigation should be appointed. It further gave as its opinion that it would be well if the business of establishing a steel foundry and its subsequent control were entrusted to the Department of Agriculture and Commerce instead of to the naval and military authorities.

This view was adopted by the Government, and a committee was appointed by them to make investigations and report upon the whole question, more particularly as to the "amount of iron ore obtainable in Japan, the trial manufacture of pig-iron and steel, and the organisation of the works."

The committee appears to have been a thoroughly representative one, comprising experienced officials from the War, Finance and Navy Departments, as well as experts from the Mining Bureau of the Department of Agriculture and Commerce and the Tokio University. The investigation occupied about five years, and as a result, and after a successful trial manufacture of iron had been made at Kamaishi, in Rikuchu, the Government decided to establish a steel works in Japan, and with that object submitted a Bill to the Diet at the beginning of 1896, asking for an appropriation of 4,095,793 yen, to be voted as a continuing fund spread over four years. The scope of the works was to be sufficient to turn out 60,000 tons of steel of various kinds, or less than one-half of the total quantity—130,000 tons—required at the time. In the Government estimates 300,000 yen was set apart for the purchase of the necessary ground, 100,000 yen for the preparation of the

site, and 560,500 yen for building purposes. The Government proposals were unanimously passed by both Houses of the Diet, and it was decided to entrust the control of the undertaking to the Department of Agriculture and Commerce, as suggested five years previously by the House of Peers.

After the claims of Ujina, Hakata, the Hok-Kaido and Wakamatsu, in Chikuzen, to be selected as the site for the works had been severally considered, the last-named place was eventually chosen, and on March 30, 1896, the organisation of the steel foundry was officially announced by imperial decree. The staff, exclusive of workmen and artisans, to consist of a president, with a salary of 4,000 yen a year, one chief engineer with a salary of 3,000 yen a year, two managers with a salary of 2,000 yen a year each, eight experts with salaries averaging 1,200 yen a year, and thirty clerks and forty assistants with an average monthly wage of 30 yen. Provision was also made for the employment of foreign experts and two German engineers were engaged.

Mr. Teiun Yamanouchi was appointed the first president of the foundry, and Mr. Michitaro Oshima chief expert, while Messrs. Taishin Nagao and Michisaburo Miyashita were appointed managers. On the resignation of Mr. Yamanouchi in August, 1897, Mr. Rentaro Hotta, chief engineer of the Mining Bureau, was placed in charge, to be succeeded a few months later by Mr. Tsunashiro Wada, the present president.

At the time of the inception of the undertaking Mr. Wada was director of the Mining Bureau in the Department of Agriculture and Commerce, and was one of the original members of the committee of inquiry appointed by the Government in 1892. He was consequently thoroughly acquainted with the details of the scheme, with the origin of which he was so closely identified, and it was, I believe, on his initiative that the original idea that the foundry was simply required to manufacture military and naval requisites for the Government was altered, and a programme of a more general scope adopted.

In the meantime experts had been despatched to Europe and America to inquire into the condition of the steel works in various foreign countries, and to obtain expert opinion abroad as to the new undertaking. As a result of these inquiries it was found that the original estimates of the cost were far too small, and in 1898 the Government obtained from the Diet an additional sum of 6,474,056 yen towards the expense of the work, while in its thirteenth session (February 1899) the Diet was asked to vote a further sum of 8,632,845 yen, including

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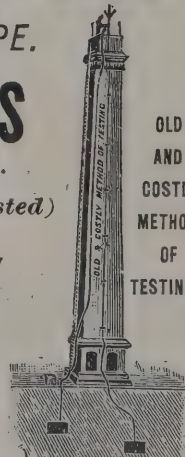
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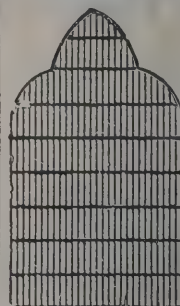
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yen for working capital, 3,632,845 yen for the acquisition and their improvement, and 500,000 yen as a total thus appropriated for the establishment of the works are known as the Imperial Japanese Government and Steel Works, and are situated close to the town of Wakamatsu, in Chikuzen, in the north-west corner of Kiushiu, the locality being Yawatamachi, Ougagori, in the Prefecture of Fukuoka. The nearest railway station is at Okura, 14 cho, or about one mile, from Wakamatsu. Wakamatsu itself lies nine miles to the west of Moji, the well-known coal-pit on the Shimonoseki Straits, the northern terminus of the Kiushiu Railway. The ground occupied by the steel works, in area close upon 1000 tsubo (or about 248 acres), with an additional lot of 1000 tsubo (over 74 acres) for enlargement purposes, on the eastern side of a large lagoon 10 miles in circumference. This lagoon adjoins and is connected with a pool or bay about a mile in diameter at its greatest width, which is connected with the sea by a short and narrow channel, the west side of which is situated the town of Wakamatsu. The lagoon is for the most part very shallow, but is to be dredged and deepened by the Harbour Works Company preferred to. The present depth, which is about 8 feet, is to be increased to 20 feet, and a quay wall over 1000 feet long is being built along the front of the works. The commercial benefit which Wakamatsu might possibly derive from its proximity to the coal-fields of Chikuzen and in the completion of the Kiushiu Railway system, was recognized even before the place was considered as a site for a permanent steel works. It suffered, however, from the disadvantage of having a very shallow harbour, and it was consequently necessary that something should be done to render it easy of access from the sea before it could become the great port which its situation warranted one in believing it could eventually become. In November 1888 therefore authorities were requested to sanction the organisation of a company to conduct the work of deepening the harbour, which at that time was only about 5½ feet deep in the shallowest part. An investigation was made, and Mr. Isoji, an engineer of the Home Department, in a report on the proposed dredging, issued by him in November 1888 stated that a capital of 600,000 yen would be required, and a breakwater 2,245 yards long should be constructed, and

that the shallowest parts, both within and outside the harbour, should be dredged. He suggested that the expense of undertaking the work could be met by the levying of dues on ships entering the harbour, and by the disposal, either by sale or lease, of the land which would be reclaimed in the course of the work. In May 1900 official sanction was obtained, and the Wakamatsu Harbour Works Company was organised. The work of dredging was commenced some time afterwards, and by June 1893 a depth of over 8 feet had been obtained. In April 1894 official sanction was given to the company to charge dues on ships entering the harbour. In May 1896 it was resolved to extend the dredging operations in view of the fact that the Government had selected Wakamatsu to be the site of the new steel foundry. As considerable inconvenience was caused, however, by the collection of shipping dues from every ship entering the port with materials for the construction of the Government works, it was in December 1899 agreed between the Government and the Harbour Works Company that the fees should be abolished in the case of such ships, and that in lieu thereof a sum of 500,000 yen should be paid by the Government to the company during a period of five years. The company thereupon increased its capital to 1,500,000 yen, and further extended the scope of its work. As a result the whole of the Wakamatsu Harbour will be dredged to a depth of 20 feet, and ships of 3,000 tons displacement will be able to approach the quay wall belonging to the steel works and load and unload cargo alongside.

The work already (December, 1901) completed consists of a channel 6,000 feet long, 240 feet wide and 14 feet deep, extending from the main channel outside the harbour to the Kiushiu Railway Company's pier. The greater part of the breakwater has also been completed.

The quay is connected by a branch line with the main line of the Kiushiu Railway, as well as with all parts of the works, the length of railway lines within the works amounting to about 20 miles. The gauge in use is the same as in other parts of Japan, and trucks can consequently be transferred from the Kiushiu Railway lines to the lines in the works, and taken to any part of the latter.

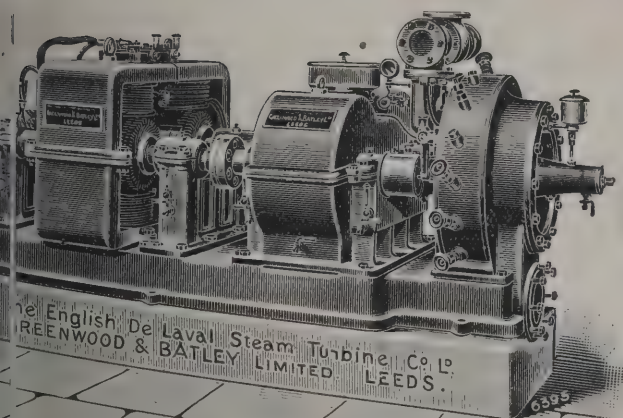
The machinery for loading and unloading ships or railway waggons consists of:—Two 1½-ton electric movable portal cranes, one 25-ton quay crane, fixed, driven by electricity, and one 10-ton shear-leg, hand worked.

Water is brought by conduit from the Itabitsu River near Okamwa, Ougagori, and distributed by the same means all over

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the works. The length of the conduit is about  $2\frac{1}{2}$  miles, and the average amount of water supplied is 1,200 gallons per minute. For the purpose of storage two reservoirs have been built.

The works are divided into three departments: (1) the pig-iron department; (2) the steel department, and (3) the rolling-mill department. In addition to these there are a central pumping station, an electric central building, a repair shop, an iron foundry, a pattern shop and foundry, sand storage, a boiler shop, smithy, chemical and mechanical laboratory and inspection bureau, and firebrick plant. There are also, of course, offices and dwelling-houses as well as a hospital. The various buildings are all lighted, both outside and inside, by electric light, about 120 arc and 1,000 incandescent lamps being used.

Steam, electric and hydraulic power is used in the works, the first, except in the case of locomotives, being produced in steam boilers fired with waste gas from blast furnaces and coke ovens. Altogether twenty-four steam engines of 31,200 horse-power and fifty-two steam boilers of about 10,000 horse-power are used in the works.

I am informed that all the machinery used in the works, with the exception of the electric cranes which were made in America, came from Germany.

It may be mentioned here with reference to the offices, hospital and houses, &c., that the head office is a two-storeyed brick building, covering an area of 720 square metres, that the hospital building covers an area of 872 square metres, and that the officers' quarters occupy ground to the extent of about  $3\frac{1}{2}$  acres.

The dwellings for the workmen and their families are built of wood and occupy a space of about  $5\frac{1}{2}$  acres.

The raw material used in the works—magnetite, hematite and a smaller quantity of zimonite—is all obtained in Japan, with the exception of the portion of the ore which is supplied, under contract, by the Hang-Yang Iron Works from their mines in Dayeh, Hupeh, China. Japanese iron ore comes principally from the Akadani and Kamo iron mines in Echigo, which have been purchased by the works, and in smaller quantities from other mines. It is expected that the Akadani mine when in full working order will turn out about 100,000 tons of ore annually, while the amount to be supplied by the Chinese mine, under contract, is from 50,000 to 70,000 tons per annum.

In addition to the two iron mines mentioned above the works have also purchased for their use three coal mines, the Takao, Igisu and Uruno in Kahogori, Chikuzen, all within

30 miles of the works, and connected with the latter by rail. Coal is also obtained from various private mines in Japan.

It is estimated that the amount of iron ore required for consumption every year, when the works are in full working order, will be 250,000 tons, and that the amount of coke and coal consumed will be 380,000 and 800,000 tons respectively.

As regards the cost of the iron ore, it was recently stated in the "Jiji shimpo" that in February last the Hang-Yang Iron Works supplied from their mine 60,000 tons of iron ore at a cost of from 2 yen 50 sen to 3 yen per ton at the mine, the freight thence to the Wakamatsu works averaged 50 sen. The total cost of the ore per ton at the works amounted, therefore, to from 7 yen to 7 yen 50 sen, and was the cheapest ore supplied. It is estimated, however, when arrangements have been completed for bringing ore from the Akadani mine, the cost of the ore laid down at the works, i.e. freight and other charges included, will be about 5 yen per ton.

According to a recent official announcement the works intended to supply, as far as possible, all the steel materials required by the Government at a price to be arranged annually in advance, irrespective of the current foreign market prices. Certain kinds of steel materials will also be supplied, but only in large quantities to Japanese engaged in industrial business at a price lower than the cost of imported articles. The terms at which the Government will be supplied is to be determined in advance by arrangement with the official department requiring the materials, on the basis of the average prices ruling abroad during the immediately preceding five years, the state of the work at the foundry being also taken into consideration.

In February last the manufacture of pig iron was commenced, and in May Siemens's steel was turned out in an amount of about 40 tons a day. Towards the end of June of the five roll mill plants having been completed, the production of medium and small rails and plates was started.

Speaking at an inaugural banquet held in Tokio in June last, Mr. Wada, the president of the works, stated, according to a report in the *Japan Times*, that the experiments that had been made had proved the efficiency of the works for the production intended, and as 90,000 to 100,000 tons of steel could be provided in a year when all the arrangements had been completed, and the operations could be carried out to the full extent, he was confident that the profit realised from the works might cover in a reasonable space of time the capital invested in this important and novel industry in Japan.



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# The Architect.

## THE WEEK.

As far as can be judged from two days' proceedings the Sanitary Congress at Manchester appears likely to obtain phenomenal success. This year the communications are of unusual interest. The Sanitary Institute has been able to secure the co-operation of several architects, and the papers they have produced for the occasion have a directness of applicability which does not always characterise the essays read on similar occasions. There are several topics which demand discussion. Some of the recent legislative measures have not been successful, and at present there is a possibility that the Factory Acts will not be as efficacious as was expected. There is no subject which has more public interest, and yet through a variety of causes the working of the Act has been carried out in a manner which has not made the owners of factories anxious to put their buildings in order.

In America and Canada there is a law by which workmen can have, if wages are not regularly paid, a lien or claim on the buildings they construct. In some parts of the United States the lien has precedence over mortgages, but in others it follows the mortgages. What position does the architect hold in such a transaction? A case of this kind was lately decided in the High Court of Justice, Toronto. The plaintiff, who was a workman, made an action against the owner of the property and on the architect. With the object of having the architect's certificate aside, or damages recovered, counsel for the architect claimed that the action against him should be dismissed on the ground that there was no cause. The Court held that the architect was neither a contractor nor a wage-earner, a supplier of materials, an owner, nor a mortgagee, he could have no part in an action to realise a lien. An action may be taken against the architect, but it must be under some other Act than the Mechanics and Wage Earners' Lien Act.

From time to time there are announcements of new brick-laying machines which are expected to dispense with manual labour, but as one of the commercial agents of the Government of the United States has reported a recent invention in Canada which has been endorsed by the State Department, it may be assumed to be more than rumour. According to the agent, "the machine, worked by two men in a lad, will lay 400 to 600 bricks per hour. Door and window spaces cause only a slight delay. The machine is suited for all plain work, such as walls, sheds, mills, factories, rows of cottages, piers of bridges, &c. Considerable pressure is put on the bricks, and it is claimed that the work is more firmly done than by hand. The invention will do the work of six or seven skilled bricklayers, and it is believed that a machine adapted to build a factory covering only 40 feet could be put on the market for 500 dollars. The apparatus can be readily worked after a fortnight's instruction." It has yet to be seen whether the machine will serve for brickwork on a small scale; but the endeavour of bricklayers to increase the cost of work by the slowness of their operations is an inducement to inventors to create something which will diminish the necessity for workmen.

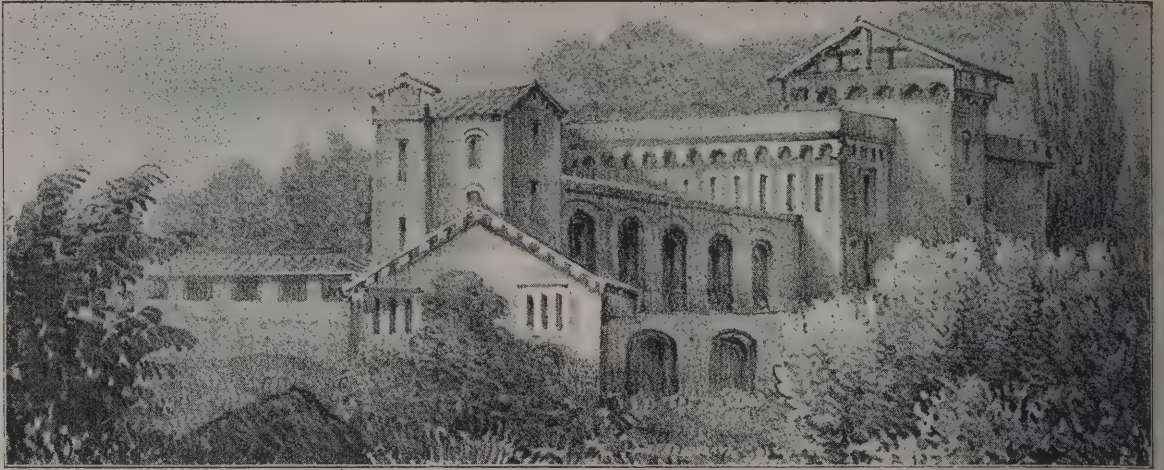
The effectiveness of the Krupp works at Essen can be judged from the following statistics:—In 1901 the plant consisted of 5,300 machine tools and workshop appliances, 24 trains of rolls, 141 steam hammers, 63 hydraulic presses, 10 of them bending presses of 7,000 tons each, one rolling press of 5,000 tons, and one of 2,000 tons effective force—327 stationary boilers, 513 steam-engines, with a total of 36,561 horse-power, 269 electro-motors and 591 cranes. There are no less than 43,083 persons employed by the firm. A census is occasionally taken, and in May 1901 it was found that the total number of persons connected with the works, including the wives and children of the employés, was 147,645. The business was started in 1811, and the first furnace for the manufacture of cast steel was erected. For fifteen years the experiment was unprofitable. The management is in the hands of fourteen directors.

ONE of the troubles of borough engineers in manufacturing towns arises from trade effluents in sewers. The fluid may deteriorate the brickwork or cement or it may have an effect on sewage, and increase the expense of purification or utilisation. On the other hand, interference with the processes of trade may offend the most important class of property owners, and cause the removal of industries. It is mainly owing to the latter consideration that the Prevention of Pollution Act has produced so little benefit. A case has been for a year under deliberation with the Manchester Corporation which exemplifies how hard it is sometimes to arrive at a decision on such subjects. In May 1901 there was an explosion in Miles Platting which excited some commotion as well as damage. A special sub-committee was at once appointed to consider the circumstances. There was no difficulty in discovering the origin of the affair. The Manchester Oxide Company stated that the explosion was due to the accidental ignition by their workmen of vapours of carbon bi-sulphide which had inadvertently escaped from their works. The leakage of carbon bi-sulphide was due to the firm being under the impression that the drain down which this liquid escaped led to a safety storage reservoir, whereas it was afterwards found to lead direct into a sewer. The expense of repairs was not more than 30%. A long investigation followed in order to prevent similar dangers. Finally it was decided to seek powers to prohibit any matters being discharged into the sewers which are injurious to the health of the workmen employed in the sewers, or which may cause a nuisance in the districts through which the sewers pass. Upon these powers being obtained, it is hoped that the risk of such occurrences as led to the formation of the special sub-committee will be very considerably minimised.

For the wood paving of Paris several varieties of timber are employed. Not only France but Florida, Norway, Australia, Borneo, Annam, &c., contribute materials. The blocks are prepared near the riverside beyond the Pont Mirabeau, and creosoted in municipal workshops. The cost to the city is from 15 frs. to 18 frs. a square metre. The annual outlay for keeping up of roads controlled by the city is about 1.45 fr. per metre, while in those for which a contract is let it amounts to 2.57 frs. The wood lasts about nine years, but it is expected that the block will have a longer duration if a machine lately invented for planing and cleaning the surface becomes a success.

THE name of CHARLES LANYON is not likely to be often mentioned during the meeting of the British Association in Belfast. Yet there is no doubt that the present appearance of the city was mainly determined by his skill as an architect and as an engineer. Another element of the success of Belfast arises from the fact that owing to financial difficulties the DONEGAL family, or rather their creditors, were compelled to dispose of their interests, and that the sites were purchased in most instances by occupiers. That happened about fifty years ago. Belfast is thought to be a corruption of an Irish term meaning the mouth of the ford. To protect the pass a castle seems to have been erected at the beginning of the fourteenth century. But the wars with the native Irish retarded the progress of the place. The Earl of ESSEX was one of the first to realise the advantages of the site, and he recommended that a dockyard should be constructed. It was not until Sir ARTHUR CHICHESTER, the founder of the DONEGAL family, was appointed Lord Deputy that Belfast became the nucleus of a town. Then its progress was unsurpassed in Ireland. The town had, however, to suffer much in the troubled times which followed, and it was only in the reign of WILLIAM III. that its position could be considered as secure. CHARLES LANYON held manifold offices, and under the circumstances that was an advantage. He was county surveyor, harbour engineer, city architect, and he enjoyed the largest private practice. He was able to mould various public bodies to his will, and induced them to combine in the improvement of the town and the river Lagan. He had the satisfaction of feeling, when his end approached, that he left a very different Belfast from that which he first knew, and the important works which have since been carried out may be regarded as no more than a realisation of his projects.





PAINTERS' ARCHITECTURE: PHILIPPO LAURI.

### THE ROYAL INSTITUTION.

THE appointment of Professor JAMES DEWAR as president of the British Association for the Advancement of Science is a compliment not only to the physicist who has been able to give a certain degree of permanence to liquefied gases, but to the Royal Institution, with which he has been connected for some years. He has carried on the traditions of YOUNG, DAVY, FARADAY and TYNDALL, and in that way has upheld the reputation of the Institution. Some months ago CARL SNYDER said "it would be hardly too much to say that during the hundred years of its existence the Royal Institution alone has done more for English science than all of the English universities put together." The Institution which has accomplished such important work depends mainly for its existence on the subscriptions of the members, and during the century of its activity the expenditure has been 100,620%. That is an average of 1,000% per annum, and the sum would be inadequate if the professors who have taught and experimented were not enthusiasts and capable of undergoing great sacrifices for the promotion of science.

It is well, however, to remember that the man to whom the foundation is principally due was a New Englander. His family name was THOMPSON, but he is generally known as Count RUMFORD. He fought on the British side in the American Revolution, and for his services he obtained an appointment in England. He had a genius for social projects, but England was too conservative to entertain them. He therefore entered the service of the King of BAVARIA, by whom he was created a count. He used to visit England occasionally. With his aid the Royal Institution of Great Britain was established in 1799 and incorporated in 1800. Its objects were described as "the diffusing of knowledge and facilitating the general introduction of useful mechanical inventions and improvements, and teaching by courses of philosophical lectures and experiments the application of science to the common purposes of life." Although the popularising of science has been the chief purpose of the Society, of late years a wide scope has been allowed to lecturers, and art, literature, archaeology, philosophy and other subjects have been treated.

The versatile THOMAS YOUNG was the first philosopher attached to the Institution. He was not an attractive lecturer, and his genius was in consequence unappreciated by the majority of his contemporaries, and does not receive much recognition in our age. ARAGO declared him to be one of the greatest of English men of science. There were few branches of science as then known with which he was not acquainted. The reports of his lectures on natural philosophy exemplify the precision of his knowledge, and Egyptologists are indebted to him for his interpretation of the Rosetta inscription, which led to a revelation of hieroglyphics.

HUMPHRY DAVY possessed qualities in which YOUNG was deficient. He was only twenty-three when he first appeared as a lecturer before the Royal Institution, but at that time he had won a reputation for his researches, theories and discoveries. His lectures on galvanism and

electro-chemical science were novelties to the members. DAVY was imaginative, and his descriptions of natural phenomena were examples of a noble variety of eloquence in which great effects were produced by the use of simple language. Pure science could not be expected to draw large audiences, however ably treated, but with DAVY there was always expectation of discoveries which could be turned to account in manufactures. In that way it was believed to be profitable to pay attention to all he said.

His most valuable discovery was the philosophic genius MICHAEL FARADAY, who came to him in the guise of a working bookbinder. FARADAY had not such an education as DAVY received, and he could not have acquired the self-confidence which is a privilege of members of the medical profession. He never forgot that he belonged to a humble class, and this prevented him from becoming overbearing or arrogant, no matter how important were the fruits of his researches. He was likewise deeply religious, and he never attempted by aid of the Patent Office to enrich himself by any of his applications of science. His ability he regarded as a great trust for the public benefit. His language in lecturing was, if possible, more simple than DAVY's, and he was so unassuming that many people were unable to realise his extraordinary power.

JOHN TYNDALL, who came next, was of a more combative disposition than his predecessors in the laboratory and lecture-room of the Royal Institution, but that quality especially adapted him for a revolutionary age. He was comparatively young man, being only thirty-three, when he was appointed professor of natural philosophy, and for thirty-five years he loyally devoted himself to the Royal Institution. In 1874 he presided at the meeting of the British Association in Belfast, and therefore in more than one way was the predecessor of Professor DEWAR.

On looking back on what was accomplished by YOUNG, DAVY, FARADAY and TYNDALL, at so little cost to the country, Professor DEWAR was justified in saying that the exceptional man is about the cheapest of natural products. But he doubts "whether we can reasonably count upon a succession of scientific men able and willing to make sacrifices which the conditions of modern life tend to render increasingly burdensome. Modern science is, in fact, in something of a dilemma. Devotion to abstract research upon small means is becoming always harder to maintain, while at the same time the number of wealthy independent searchers after truth and patrons of science the style of JOULE, SPOTTSWOODE and DE LA RUE apparently becoming smaller. The installations required by the refinements of modern science are continually becoming more costly, so that upon all grounds it would appear that without endowments of the kind provided by Dr. CARNEGIE the outlook for disinterested research is rather dark. On the other hand, these endowments, unless carefully administered, might obviously tend to impair the single-minded devotion to the search after truth for its own sake, to which science has owed almost every memorable advance made in the past. The Carnegie



stitute will dispose in a year of as much money as the members of the Royal Institution have expended in a century upon its purely scientific work."

Professor DEWAR's discoveries of the liquefaction of gases has increased the renown of the Institution with which he has been connected since 1877. Three years before that time he had read a paper to the British Association on the latent heat of liquid gases. The subject was a wide one, and was the last which occupied the attention of BACON. He had said that the production of cold was worthy of inquiry for the use and the disclosure of causes, "for heat and cold are nature's two hands whereby she chiefly worketh, and heat we have in readiness in respect of the fire, but for cold we must stay till it cometh to seek it in deep caves or high mountains, and when all is done we cannot obtain it in any great degree, for flames of fire are far hotter than a summer sun, but vaults and hills are not much colder than a winter's frost." But he could not think of any natural phenomenon without having the desire to turn it to account for the benefit of man. Accordingly on a snowy day in 1626 it struck him that cold substances might be used to prevent putrefaction. He went into a cottage at Highgate, bought a fowl, and with his own hands filled it with snow. BACON caught a chill during the operation. He had to be carried to Lord ARUNDEL's mansion, and there, after a week's illness, he expired. To the end his thoughts were with his experiment, which he described as succeeding "excellently well." Fifty-six years afterwards we find ROBERT BOYLE investigating cold by means of mixtures of snow or ice and salt. But the search after the *primum frigidum* was too laborious for a fine gentleman, and the conclusion of it was left to others. In our time many investigators have been engaged on the subject. Much has been ascertained, and the problem at length was so far narrowed as to become "not so much how to produce intense cold as how to save it when produced from being immediately levelled up by the relatively superheated surroundings. Ordinary non-conducting packings were inadmissible because they are both cumbrous and opaque, while in working near the limits of our resources it is essential that the product should be visible and readily handled."

At length in 1892 Professor DEWAR tried the effect of keeping liquefied gases in vessels having a double wall, the annular space between being very highly exhausted. The experiment was a success. Several forms of vessels have been devised, and liquid air can now be sent in them across the Atlantic.

It is impossible to foretell all the applications of the discovery which may arise. The connection between different varieties of cosmic force becomes more apparent on all such additions to our knowledge. We may learn more of heat, which is one of the great working powers of nature, by means of the qualities of cold. Then there are thermo-electric and other agencies from which we may derive more advantage by the changes which are suggested in the liquefaction of gases. New experiments have been made on living organisms, and it is remarkable that as regards putrefaction, instead of freezing succeeding "excellently well," as BACON reported, liquid hydrogen and liquid air do not affect the vitality of the lower forms of life. It has been found that many kinds of micro-organisms can again be exposed to the low temperature for six months without any loss of vitality. As Professor DEWAR says:—"At such a temperature the cells cannot be said to be either alive or dead, in the ordinary acceptation of these words. It is a new and hitherto unobtained condition of living matter—a third state." Such modest rewards as scientific institutions can confer have been received by him, and it was fitting that among them should be the Rumford medal and the Hodgkins medal, which recall two worthies who enriched the Royal Institution.

A Group of windows, consisting of a rose window and five lancets—which are in two rows below the rose window—has recently been placed in the south transept of Westminster Abbey as a memorial to the late Duke of Westminster. The group has cost nearly 2,400*l.*, which has been raised by public subscription. The windows have been designed by G. F. Bodley, A.R.A.

## THE ENCYCLOPÆDIA BRITANNICA.\*

THE fifth volume of the supplement to the "Encyclopædia Britannica" has a prefatory essay on "The Application of the Doctrine of Evolution to Sociological Theory and Problems," by Mr. BENJAMIN KIDD, the author of some able books on the system. He supports the assumption that "the welfare of citizens cannot rightly be sacrificed to some supposed benefit of the State, but, on the other hand, the State is to be maintained solely for the benefit of citizens. The corporate life must be subservient to the lives of the parts, instead of the lives of the parts being subservient to the corporate life." It is stated by Mr. KIDD that the changes in the application of evolution to sociological theory are only in their initial stages. It is suggested by him that advanced races at the present day are representative in virtue of qualities in the minds of those who preceded them which had no relation to current environment. In other words, utilitarianism may become less dominant than formerly. In that case art will have a chance, for it will no longer be controlled or compelled to demonstrate its right to existence by the *cui bono* principle.

Meanwhile the utility test is sure to prevail. As evidence of its power there is nothing more remarkable than the extensive use of iron and steel which is described in an article by Professor HOWE, of Columbia University. He tells us that within the last twenty years of the nineteenth century the world's production of pig-iron more than doubled, and that of steel increased fivefold. In 1880 the production of wrought-iron in the United States was 70 per cent. greater than that of steel, while now the quantity of steel is six times that of wrought-iron. The necessity of thoroughly consolidating steel in masses has had the effect of reviving the application of the hydraulic press, and for some purposes it is found to be preferable to the steel hammer. The Professor says:—

The demand for very large forgings, especially for armour-plate and ordnance, has led to the erection of enormous steam-hammers. The falling parts of the largest of these, that at Bethlehem, Pa., weigh 125 tons. But even so great a hammer is an ineffective tool for making large forgings, chiefly because the effect of its blow is concentrated on the outside of the forging, and does not penetrate well towards the interior; indeed, the days of large hammers seem to be over. The use of this particular one has been abandoned for that of an enormous hydraulic press which exerts a pressure of 14,000 tons. It is moved by water under a pressure of 7,000 lbs. per square inch, supplied by pumps of 16,000 horse-power. For forging shafting and other objects not readily made in rolling mills, because their cross-section is not uniform, the hydraulic press seems to be firmly established as by far the most efficient tool. But though the great 14,000-ton Bethlehem press is used with great success for forging armour-plate also, the rolling-mills certainly has special merits for such a purpose, and with it all of Krupp's armour-plate is now made. The rolls of this great armour-plate mill are 4 feet in diameter and 12 feet long, and can receive an ingot 4 feet thick.

As the fifth volume comprises terms between Glarus (Switzerland) and Jutland, several articles relate to geography. It is satisfactory to learn that since 1880 authority was given for the erection of buildings having a value of about 18,000,000*l.* in Glasgow, and of that sum one-third belongs to the years 1896-99. Greece is recorded as having made sensible progress since 1870. There has been an increase in the rate of population; no less than 22.3 per cent. of the people live in towns. As in the old days, owners of estates prefer to dwell there, and are indifferent to their tenants. The imports in 1898 were nearly double the value of the exports. In the trade with Great Britain the imports during 1897 were 29,486,910 frs., the exports being 26,763,302 frs. There are no manufacturing industries on a large scale. Mr. BOURCHIER affirms that with improved communications and tranquillity the number of visitors to Greece would be multiplied, and thus profit would be derived from the natural and historic attractions. The article on Holland suggests that technical education has taken a hold on that staid country. They

\* The new volumes of the *Encyclopædia Britannica*, constituting in combination with the existing volumes of the ninth edition the tenth edition of that work, and also supplying a new, distinctive and independent library of reference dealing with recent events and developments. The fifth of the new volumes, being volume xxix. of the complete work. (Published by the *Times*, London.)



have a school for engineers, schools of commerce, horticulture, dairywork, industrial art, music, dramatic study, painting and architecture. As many as 120,975 workers were found by the latest census to be occupied on building. Industry has been promoted through the exhibitions, museums and schools. In 1875 there were 770 miles of railway, and in 1898 the mileage had increased to 1,900. It is interesting to learn that in Honolulu, the capital of the Hawaiian Islands, "the public buildings would do credit to any civilised country." It has also a flourishing art league which exhibits twice a year.

Hungary, in spite of the political discussions, also realises the necessity of technical education. At Budapest 34 professors and 74 lecturers are engaged at the Polytechnicum. There are also 45 art schools with 337 teachers. In the description of India we are told that little demand is made for the services of engineers; for several years there has been no addition to the engineering colleges and the number of students has not exceeded 667. Sanitation is still in a backward state in India; there are sanitary officers, but unless plague visitations are accepted as object-lessons little hope of improvement can be entertained. It is believed, however, that the "sleeping princess has arisen and moves forward, though with dazed eyes and uncertain steps, encumbered by the folds of her old-world garment. In confidence, yet not without hesitation, she follows a stranger into a world that is new and unimaginable to her." Italy, if tested by statistics, has given undoubted evidence of progress. The number of motors has increased from 14,502 in 1890 to 20,472 in 1898. Electric power has been doubled. The advancement is seen also in particular industries. We are told that "furniture-making in different styles is carried on all over Italy, especially as a result of the establishment of industrial schools. Each region produces a special type, Venetia turning out imitations of sixteenth and seventeenth-century styles, Tuscany the fifteenth century or Cinquecento style, and the Neapolitan provinces the Pompeian style. Furniture and cabinet-making in great factories are carried on particularly in Lombardy and Piedmont. Bent-wood factories have been established in Venetia and Liguria." In no part of the world described in the volume has more been accomplished within a few years than in Japan. We hear so much of late about house-taxes and impediments which prevent foreigners from building; it is well to have a clear statement on the subject. Captain BRINKLEY, in his article, says:—

Foreigners are not at present permitted to own land in Japan in their individual capacity. The forms of tenure lawful for them are (1) tenure by ordinary lease; (2) tenure by superficies; and (3) tenure by ownership as a juridical person. Tenure by ordinary lease is limited to twenty years (subject to renewal), and the lessee is entitled to use and enjoy the object of the lease, whether land or buildings, under conditions substantially the same as those prescribed by English law, except that buildings, fixtures, trees and plants placed there by the tenant may be removed by him at the termination of his lease. Tenure by "superficies"—a term which does not accurately represent its Japanese original, "superficial right"—is, in effect, a lease for purposes of building or planting. Such a lease may be for any term of years, fixed according to the convenience of the contracting parties, and the lessee (superficiary) is absolutely guaranteed against disturbance throughout that period—whether it be fifty or a thousand years. Even though the owner mortgages or sells the land before the expiration of the period, the rights of the superficies are not affected, and the superficies on his side may assign his superficies without prejudice to the rights of the owner. In short, this kind of tenure differs from actual ownership in name only. As to ownership by a juridical person, it is to be noted that the term "juridical person" signifies an association of two or more individuals of any nationality, or of mixed nationalities, formed for commercial, industrial or certain other purposes registered in Japan, and carrying on business according to the provisions of Japanese law. Such an association in its corporate capacity may own land. Thus two or three foreigners contemplating the erection of a factory or mercantile premises in Japan, can become owners of land for that purpose, though as individuals they are not entitled to such a privilege.

The statement seems to refer to straightforward arrangements, but there is no denying the fact that in all matters relating to the ethics of business the Western world has a prejudice against the Japanese. The competition is in consequence supposed to be less dangerous to the pro-

ducers in other countries. From the skill of the craftsmen it is not difficult to make shams which are deceptive, but, on the other hand, many of the merchants with whom the Japanese trade are not examples of probity. It is also remarkable that, in spite of their great industry and ingenuity, they have not that administrative power which is essential in business. The late Mr. ANDERSON, who was a master of the subject, contributed a history of pictorial art, of which the only defect is its briefness. From the character of the common products which are seen in English shops it might be presumed that the efforts of former artists were not valued. But we are informed that "the art of the past has never found a higher appreciation than at present." It is inevitable that Japanese work will be affected by the study of the varieties of Western examples; whether the change will be for the better has yet to be discovered. The modern developments of art are expounded by Mr. E. F. STRANGE.

Biographies form an important part of the contents, and, as it happens, several painters are included. KATE GREENAWAY, we are told, obtained no less than 8,000*l.* for our of her little toy-books. An illustration is given of M. HENNER'S *The Levite Ephraim*, which is one of his characteristic nude figures seen in profile. Of FRANK HILL it is said that the painting which gained the Traveling Studentship in 1868, *The Lord gave, and the Lord hath taken away*, "exhibited nearly all the best technical qualities to which he ever attained, except high finish and clearness and a very sincere vein of pathos." He is compared with JOSEF ISRAELS, who in turn is compared with J. F. MILLET. A plate is given of M. ISRAELS'S *David Singing before Saul* which is unlike the majority of the Dutch artist's works. Mr. J. C. HOOK is represented by his *Luff, Boy!* which Mr. RUSKIN lauded as suggesting the proved weapons in the armoury of England; for, as he said, if the bare head, bare fist, bare foot and blue jacket of the sailor boy will not save us in a war against France or Russia, nothing in the form of machinery will. Mr. R. M. HUNT, the American architect, is described as being "the first to command respect in foreign countries for American architecture, and was the leader of a school that has established in the United States the manner and the traditions of the Beaux-Arts." The career of Mr. HOLMAN HUNT is narrated, and an illustration is reproduced of his *Finding of Our Saviour in the Temple*, now in the Birmingham Art Gallery. The name of GEORGE INNESS, the American landscapist who is not known in England, recalls EMERSON spirit, for it is stated, "Swedenborgianism, symbolism, socialism, appealed to him as they might to a mystic or an idealist. He aspired to the perfect unities and was impatient of structural foundations." He went through a long course of experimenting, and finally seems to have set aside recollections of foreign painters' works and to have represented nature as it appeared to himself.

GEORGES EUGÈNE HAUSSMANN would not be recognised as an artist, but no man exercised so much influence in Paris, and as the city is widely accepted as a pattern for other cities his power was felt elsewhere. He was the son of an Alsatian linen-draper, and strange to say he studied at the Conservatoire in order to become a professional vocalist. Having made himself eligible for office he rose to be a prefect, and his success in organising demonstrations in honour of LOUIS NAPOLEON at Bordeaux caused his promotion to the Prefecture of the Seine. With the aid of ALPHAND he was able to realise his grandiose vision, but in course of time the French grew tired of his improvements, and he retired on the modest pension of 6,000 francs.

Many other articles in the volume could be pointed out with advantage if space allowed. The pages show how much interest belongs to the lives of men most of whom can be looked upon as contemporaries, and to transactions which have occurred within the last twenty years. The tendency of our age is towards specialism, and therefore only a limited segment of life and nature comes within the purview of most men. That may lead to skilfulness, but there is a risk also of narrow-mindedness being the result. An excellent corrective will be found in the pages of the new volumes of the "Encyclopædia Britannica," and in that way the advantage to all classes of readers cannot be easily measured.



## THE BRITISH ASSOCIATION.

ON Wednesday the meeting of the British Association for the Advancement of Science commenced in Belfast. The president, Professor James Dewar, M.A. LL.D., D.Sc., C.S., delivered an address in the course of which he said:—A great man has observed that the "intelligent anticipation of events before they occur" is a factor of some importance in human affairs. One may suppose that intelligent anticipation had something to do with the choice of Belfast as the meeting-place of the British Association this year. Or, if it had not, then it must be admitted that circumstances have conspired, they occasionally do, to render the actual selection peculiarly fitting. Belfast has perennial claims, of a kind that cannot easily be surpassed, to be the scene of a great scientific gathering—claims founded upon its scientific traditions and upon the conspicuous energy and success with which its citizens have prosecuted in various directions the application of science to the purposes of life. It is but the other day that the whole nation deplored at the grave of Lord Dufferin the loss of one of its most distinguished and most versatile public servants of his age. That great statesman and near neighbour of Belfast is a typical expression of the qualities and the spirit which have made Belfast what it is, and have enabled Ireland, in spite of all drawbacks, to play a great part in the Empire. I look upon your thriving and progressive city giving evidence of an enormous aggregate of industrial efforts intelligently organized and directed for the building up of a sound social fabric, and that your great industries are interlinked and interwoven with the whole economic framework of the Empire, and that you are silently and irresistibly compelled to harmonious cooperation by practical considerations acting upon the whole community. It is here that I look for the real Ireland, the Ireland of the future. We cannot trace with precision the laws that govern the appearance of eminent men, but we may at least learn from history that they do not spring from every soil. They do not appear among decadent races or in ages of retrogression. They are the fine flower of the practical intellect of the nation, working studiously and patiently in accordance with the great laws of conduct. In the manifold activities of Belfast we have a splendid manifestation of individual energy working necessarily, even if not altogether consciously, for the national good. In great Irishmen like Lord Dufferin and Lord Roberts, giving their best energies for the defence of the nation by diplomacy or by war, we have complementary evidence enough to reassure the most timid concerning the direction of Irish energies and the vital nature of Irish solidarity with the rest of the Empire. Belfast has played a prominent part in a transaction of a somewhat special and significant kind, which has proved not a little confusing and startling to the easy-going public. The significance of the shipping combination lies in the light it throws on the conditions and tendencies which make such things possible, if not even inevitable. It is an event forcibly illustrating the declaration of His Royal Highness the Prince of Wales that the nation must "wake up" if it hopes to face its growing responsibilities. Belfast may plead with some justice that it, at least, has never gone to sleep. In various directions an immense advance has been effected during the twenty-eight years that have elapsed since the last visit of the British Association. Belfast has become first a city and then a county, and now ranks as one of the eight largest cities in the United Kingdom. Its municipal area has been considerably extended, and its population has increased by something like 75 per cent. It has not only been extended, but improved and beautified in a manner which very few places can match, and which probably none can surpass. Fine new thoroughfares, adorned with admirable public institutions, have been opened through areas once covered with crowded and squalid buildings. Compared with the early fifties, when iron ship-building was begun on a very modest scale, the customs collected at the port have increased tenfold. Since the introduction of the power-loom, about 1850, Belfast has distanced its rivals in the linen industry, which continues to flourish notwithstanding the fact that most of the raw material is now imported instead of being produced, as in former times, in Ulster. Extensive improvements have been carried out in the port at a cost of several millions, and have been fully justified by a very great expansion of trade. These few bare facts suffice to indicate broadly the immense strides taken by Belfast in the last two decades. For an association that exists for the advancement of science it is stimulating and encouraging to find itself in the midst of a vigorous community, successfully applying knowledge to the ultimate purpose of all human effort, the amelioration of the common lot by an ever-increasing mastery of the powers and resources of nature.

The presidential address delivered by Tyndall in this city twenty-eight years ago will always rank as an epoch-making performance. Of all the men of the time Tyndall was one of the best equipped for the presentation of a vast and complicated scientific subject to the mass of his fellow-men. Gifted with the powers of a many-sided original investigator, he had at the

same time devoted much of his time to an earnest study of philosophy, and his literary and oratorical powers, coupled with a fine poetic instinct, were qualifications which placed him in the front rank of the scientific representatives of the later Victorian epoch, and constituted him an exceptionally endowed exponent of scientific thought. In the Belfast discourse Tyndall dealt with the changing aspects of the long unsettled horizon of human thought, at last illuminated by the sunrise of the doctrine of evolution. The consummate art with which he marshalled his scientific forces for the purpose of effecting conviction of the general truth of the doctrine has rarely been surpassed. The courage, the lucidity, the grasp of principles, the moral enthusiasm with which he treated his great theme, have powerfully aided in effecting a great intellectual conquest, and the victory assuredly ought to engender no regrets.

Tyndall's views as a strenuous supporter and believer in the theory of evolution were naturally essentially optimistic. He had no sympathy with the lugubrious pessimistic philosophy whose disciples are for ever intent on administering rebuke to scientific workers by reminding them that however much knowledge man may have acquired, it is as nothing compared with the immensity of his ignorance. That truth is indeed never adequately realised except by the man of science, to whom it is brought home by repeated experience of the fact that his most promising excursions into the unknown are invariably terminated by barriers which, for the time at least, are insurmountable. He who has never made such excursions with patient labour may indeed prattle about the vastness of the unknown, but he does so without real sincerity or intimate conviction. His tacit, if not his avowed, contention is that since we can never know all it is not worth while to seek to know more; and that in the profundity of his ignorance he has the right to people the unexplored spaces with the phantoms of his vain imagining. The man of science, on the contrary, finds in the extent of his ignorance a perpetual incentive to further exertion, and in the mysteries that surround him a continual invitation, nay, more, an inexorable mandate. Tyndall's writings abundantly prove that he had faced the great problems of man's existence with that calm intellectual courage, the lack of which goes very far to explain the nervous dogmatism of nescience. Just because he had done this, because he had, as it were, mapped out the boundaries between what is knowable though not yet known and what must remain forever unknowable to man, he did not hesitate to place implicit reliance on the progress of which man is capable, through the exercise of patient and persistent research. In Tyndall's scheme of thought the chief dicta were the strict division of the world of knowledge from that of emotion, and the lifting of life by throwing overboard the malign residuum of dogmatism, fanaticism and intolerance, thereby stimulating and nourishing a plastic vigour of intellect. His cry was "Commotion before stagnation, the leap of the torrent before the stillness of the swamp."

His successors have no longer any need to repeat those significant words, "We claim and we shall wrest from theology the entire domain of cosmological theory." The claim has been practically, though often unconsciously, conceded. Tyndall's dictum, "Every system must be plastic to the extent that the growth of knowledge demands," struck a note that was too often absent from the heated discussions of days that now seem so strangely remote. His honourable admission that, after all that had been achieved by the developmental theory, "the whole process of evolution is the manifestation of a power absolutely inscrutable to the intellect of man," shows how willingly he acknowledged the necessary limits of scientific inquiry. This reservation did not prevent him from expressing the conviction forced upon him by the pressure of intellectual necessity, after exhaustive consideration of the known relations of living things, that matter in itself must be regarded as containing the promise and potency of all terrestrial life. Bacon in his day said very much the same thing:—"He that will know the properties and proceedings of matter should comprehend in his understanding the sum of all things, which have been, which are, and which shall be, although no knowledge can extend so far as to singular and individual beings." Tyndall's conclusion was at the time thought to be based on a too insecure projection into the unknown, and some even regarded such an expansion of the crude properties of matter as totally unwarranted. Yet Tyndall was certainly no materialist in the ordinary acceptance of the term. It is true his arguments, like all arguments, were capable of being distorted, especially when taken out of their context, and the address became in this way an easy prey for hostile criticism. The glowing rhetoric that gave charm to his discourse and the poetic similes that clothed the dry bones of his close-woven logic were attacked by a veritable broadside of critical artillery. At the present day these would be considered as only appropriate artistic embellishments, so great is the unconscious change wrought in our surroundings. It must be remembered that, while Tyndall discussed the evolutionary problem from many points of view, he took up the position of



a practical disciple of nature dealing with the known experimental and observational realities of physical inquiry. Thus he accepted—as fundamental concepts the atomic theory, together with the capacity of the atom to be the vehicle or repository of energy and the grand generalisation of the conservation of energy. Without the former, Tyndall doubted whether it would be possible to frame a theory of the material universe; and as to the latter he recognised its radical significance in that the ultimate philosophical issues therein involved were as yet but dimly seen. That such generalisations are provisionally accepted does not mean that science is not alive to the possibility that what may now be regarded as fundamental may in future be superseded or absorbed by a wider generalisation. It is only the poverty of language and the necessity for compendious expression that oblige the man of science to resort to metaphor and to speak of the laws of nature. In reality, he does not pretend to formulate any laws for nature, since to do so would be to assume a knowledge of the inscrutable cause from which alone such laws could emanate. When he speaks of a “law of nature” he simply indicates a sequence of events which, so far as his experience goes, is invariable, and which therefore enables him to predict, to a certain extent, what will happen in given circumstances. But, however seemingly bold may be the speculation in which he permits himself to indulge, he does not claim for his best hypothesis more than provisional validity. He does not forget that to-morrow may bring a new experience compelling him to recast the hypothesis of to-day. This plasticity of scientific thought, depending upon reverent recognition of the vastness of the unknown, is oddly made a matter of reproach by the very people who harp upon the limitations of human knowledge. Yet the essential condition of progress is that we should generalise to the best of our ability from the experience at command, treat our theory as provisionally true, endeavour to the best of our power to reconcile with it all the new facts we discover, and abandon or modify it when it ceases to afford a coherent explanation of new experience. That procedure is far as are the poles asunder from the presumptuous attempt to travel beyond the study of secondary causes. Any discussion as to whether matter or energy was the true reality would have appeared to Tyndall as a futile metaphysical disputation, which, being completely dissociated from verified experience, would lead to nothing. No explanation was attempted by him of the origin of the bodies we call elements, nor how some of such bodies came to be compounded into complex groupings and built up into special structures with which, so far as we know, the phenomena characteristic of life are invariably associated. The evolutionary doctrine leads us to the conclusion that life, such as we know it, has only been possible during a short period of the world's history, and seems equally destined to disappear in the remote future; but it postulates the existence of a material universe endowed with an infinity of powers and properties, the origin of which it does not pretend to account for. The enigma at both ends of the scale Tyndall admitted, and the futility of attempting to answer such questions he fully recognised. Nevertheless, Tyndall did not mean that the man of science should be debarred from speculating as to the possible nature of the simplest forms of matter or the mode in which life may have originated on this planet. Lord Kelvin, in his presidential address, put the position admirably when he said, “Science is bound by the everlasting law of honour to face fearlessly every problem that can fairly be presented to it. If a probable solution consistent with the ordinary course of nature can be found we must not invoke an abnormal act of creative power,” and in illustration he forthwith proceeded to express his conviction that from time immemorial many worlds of life besides our own have existed, and that “it is not an unscientific hypothesis that life originated on this earth through the moss-grown fragments from the ruins of another world.” In spite of the great progress made in science, it is curious to notice the occasional recrudescence of metaphysical dogma. For instance, there is a school which does not hesitate to revive ancient mystifications in order to show that matter and energy can be shattered by philosophical arguments, and have no objective reality. Science is at once more humble and more reverent. She confesses her ignorance of the ultimate nature of matter, of the ultimate nature of energy, and still more of the origin and ultimate synthesis of the two. She is content with her patient investigation of secondary causes, and glad to know that since Tyndall spoke in Belfast she has made great additions to the knowledge of general molecular mechanism, and especially of synthetic artifice in the domain of organic chemistry, though the more exhaustive acquaintance gained only forces us the more to acquiesce in acknowledging the inscrutable mystery of matter. Our conception of the power and potency of matter has grown in little more than a quarter of a century to much more imposing dimensions, and the outlook for the future assuredly suggests the increasing acceleration of our rate of progress. It is well that his memory should be held in perennial respect, especially in the land of his birth.

## THE TREATMENT OF SMOKE.

A LECTURE on the “Treatment of Smoke” was delivered by Mr. W. N. Shaw, M.A., Sc.D., F.R.S., before the Congress of the Sanitary Institute. After some preliminary remarks, Mr. Shaw said:—

If, then, we are not entitled to expect science to tell us how to remove fogs or smoke when it has been discharged into the atmosphere, what steps can we take? So far as I know the only suggestion put forward as practicable by those interested in the abatement of the smoke nuisance is to invite householders, and compel factory owners, not to make smoke, or to consume it if they make it, or in the third event, to make a little as may be consistently with their own interests. As regards factories, very considerable improvement has followed these efforts, and I do not wish to be adversely critical where I point out, first, that the distinction drawn between the factory and the domestic establishment is unscientific, and secondly, that that was not the plan adopted in the parallel case of the removal of sewage. Am I not right in saying that the advance in sanitation in that particular has arisen from the fact that the local authorities have used common funds to provide facilities for the removal of such refuse by main drains or otherwise and have then compelled householders and others to make use of the facilities provided?

### Further Development of the Analogy.

I would like to follow the analogy somewhat further, and subsequently call attention to the share which a local authority could fairly take in such an enterprise, supposing it were agreed that the proper course to be pursued is, not to prevent smoke by penal legislation, but to encourage the interception of smoke and the removal of the sooty particles before the air is allowed to escape. I do not wish to say that this is the only or the best mode of dealing with the question; I only want to consider whether it is, *prima facie*, practicable enough to justify our including inquiries with regard to it in the demands that sanitation may reasonably make upon science.

The suggestion may seem hopelessly extravagant, but you will allow me I will offer a few considerations in mitigation of your criticism of my venturesome proceeding.

First—there is nothing new under the sun—since I commenced putting my notes together I have learned that practically I am only recalling a suggestion made many years ago. A proposal for the treatment of smoke by the erection of municipal chimneys was made in Manchester by one who was prominent among the many Manchester men of business who have been distinguished by their scientific achievements, Mr. Peter Spence. I find very much encouragement in this, because it is precisely in such a city as Manchester—a city of fogs and smoke, but also the city of Dalton and of Joule—where the facilities for the association of scientific experiments with practical life have been so wonderfully developed around the hall, that an enterprise of this character could be taken in hand, and Manchester is in a better position for taking up the almost forgotten suggestion of their fellow citizen than any other of the abodes of smoke.

Secondly, the present method of dealing with smoke is by no means final, although, as I have said, it has marked a most important stage of progress. In many cases it achieves its primary purpose excellently, yet one of the most conspicuous features of London architecture is the enormous variety of smoke cowl, in all stages of dilapidation, to be seen surmounting the roofs. Almost every chimney-stack is a sort of museum of contrivances for improving the action of chimneys. I do not know what precise meaning to attach to the different state of dilapidation, but the mere exhibition of so many contrivances can only mean that smoky chimneys are not by any means rare as they might be under more favourable mechanical conditions. I should be glad if some one would be good enough to remark that the differences of height of roofs of the London houses make the treatment of smoky chimneys especially difficult, because that would enable me to put my second consideration the more forcibly by saying that on that account, if on no other, the separate chimney method of dealing with smoke is not suited to the circumstances of large towns.

Thirdly, I notice that when the designer of a factory erects his building he takes a further step in advance in the treatment of smoke, and provides a single smoke stack for a considerable number of independent fires. The existence of this practice makes me regard the separate opening of each chimney of the domestic house into free air as not absolutely required by any physical laws governing the removal of smoke. The factory builder is not always successful in using his chimney for preventing smoke, but he is successful in leading the foul air many flues into one channel which might afford an opportunity for depriving the smoke of its soot.

Moreover, arrangements for propelling air mechanically are becoming every day more extended. Some of them as employed in various systems of ventilation are quite as elaborate as that which would be required to deal with the smoke of an ordinary



use or block of houses. A public dining-room is hardly regarded as properly equipped in the present day unless it has fan for ventilation, generally for the removal of tobacco smoke after dinner. Laboratories and other buildings of a similar character are provided with special means, mechanical or thermo-mechanical, for removing noxious fumes. There is no efficient distinction to be drawn between coal smoke and other fumes of refuse that foul the air to make it necessary to use one system for the former and a different one for the others. It seems almost certain that if the domestic architect had sufficient encouragement to make the attempt, he would not find the plan of dealing with household smoke by the method of the factory chimney or by mechanical propulsion beyond the range of practical physics.

The plan of using a single combined orifice for the delivery of the smoke of a number of chimneys of a domestic building is actually been introduced in the case of a building that had originally, and still has its separate flues, unless I have been deceived by external appearances. Within sight of the windows of my office is a row of three houses, the roofs of which are each below the level of surrounding buildings. Most chimneys in such situations in London are separately provided with some sort of cowl, but in the case I speak of groups of four chimney-stacks at the angles of a square have been capped, and a single flue led from each stack to a central chamber surmounted by a large lobster-back cowl. From this central cowl the smoke of the four chimney-stacks is delivered to the outside. This example seems to me to be especially encouraging, because it shows that if it were desirable to drain away the smoky air of houses with a view to "treatment," it might not be considered necessary to entirely rebuild the houses.

#### *Some Particulars of the Smoke Problem.*

For purposes of comparison let us next consider what is the amount of smoke-laden air with which we have to deal. It is difficult to give any but the roughest estimate. I propose to reason with the weight of air and not exclusively with its volume, because in moving large quantities of air the weight is an important element in the calculation; at the same time the weight of air is frequently overlooked. Let me give some particulars. A cubic foot of air weighs about an ounce and a quarter, or 8 lb; the air in a room 15 feet square and 10 feet high weighs about the twelfth part of a ton. A room 70 feet long by 40 feet wide and 20 feet high holds two tons of air. It is when a continuous process of supply and removal of air under consideration large weights of air must be taken into account. I shall assume that on the average every house of about 600,000 rated for the municipal purposes of London has its fires burning, and therefore two chimneys emitting smoky air for twelve hours each day, and that each chimney uses and discharges 10,000 cubic feet of air per hour. If these estimates are inaccurate, we can at least ask scientific men to correct them. On these assumptions every "working chimney" discharges 4 1/2 tons of smoky air per day; every house, on the average, 8 1/2 tons. We thus obtain the estimate of five millions of tons of smoky air sent up the household chimneys of London in one day. Some allowance has also to be made for the 14,500 factories of London, which are not altogether innocent in the matter of smoke. I have no accurate idea what the allowance should be, but taking a factory chimney as equivalent to thirty house chimneys we should get an additional 2,000,000 tons of air fouled with smoke passing up the factory chimneys; that is in the aggregate about 7 1/2 million tons of air are used per day in London to carry away smoke, as compared with about a million tons of water to carry away sewage. The cost of dealing with the sewage is about 600% per day. I have, of course, no means of estimating what the cost of dealing with smoky air would be, but supposing that a ton of dirty air could be "treated" for the same cost as a ton of sewage, the cost of clearing the air of London must be set down at 4,200% a day, equivalent to a rate of 10d. in the pound.

I would mention incidentally that to move air is a comparatively cheap matter. An electrically-driven fan will do the work of a single chimney as regards smoky air at a cost of about a penny under suitable conditions. A single colliery fan has been made to deliver as much as 200,000 cubic feet of air per minute, and its output therefore amounts to about 20 tons a day, or sufficient to carry the smoke of more than 1,000 London houses on the scale mentioned above. Five hundred of such fans would carry the household smoke of the city of London. It would mean a huge aggregation of power, but London means the same.

A layer of air 60 feet thick over the 75,000 acres comprised in the administrative county of London would weigh about 7,000,000 tons. The calculation suggests that on a day of dense fog there is very little horizontal movement of air, there is a more or less complete circulation of the air through the chimneys and back to the streets and houses during the hours when chimneys are

These figures show that although the volume of smoky air is vastly larger than the volume of sewage, yet the cost of dealing with it for the purpose of treatment may not be of an altogether different order of magnitude from the cost of the manipulation of London sewage, and the point at which I wish to arrive is, that we are justified in asking practical men of science, as a first question, whether the treatment of smoky air, on a plan somewhat similar to the treatment of sewage, is mechanically possible, within reasonable limits of original outlay and current expense.

#### *Limitation of the Analogy.*

I have now, I think, traced the parallel upon which I set out, as far as it will safely lead, and beyond this point in the treatment of smoke it would be necessary to diverge from the plan adopted with sewage, both as regards the special method of dealing with smoke and as to the part which the local authorities should take in encouraging and assisting the purification of air.

I do not suppose that it is possible to establish a few main drains for smoky air corresponding to the main sewage drains, and to use one or two cleansing stations for purifying the air from smoke. I made a rough calculation and concluded that to deal in that way with the smoky air of London would require some forty tunnels of the size of the Underground Railway tunnels to carry away the air, but in the case of air it might be possible to achieve a similar result by a large number of systems on a correspondingly small scale, and the systems might be some of them municipal and some private. A single block of houses might have means for drawing off the smoke from all its fires into a chamber wherein the smoke could be treated before the fouled air was allowed to pass into the atmosphere, and if such a system were mechanically feasible we should then be able to put a second question to practical men of science, viz. whether it is not possible to completely deposit from the air as it passes on its way the solid particles which form the smoke. It has been shown that sooty particles coagulate under mechanical action, and some years ago Sir Oliver Lodge showed experiments on the deposition of smoke in a closed chamber by means of electricity. Since that time the means of production of electricity on an industrial scale have been greatly facilitated, but no further step has been taken, so far as I know, in the deposition of smoke particles. I should like now to ask whether it is not possible to make a further advance in the direction indicated by Sir Oliver of purifying air from smoke by that means. You will notice that I do not demand that no smoke shall be produced. I think that some people may prefer to pay the cost of abstracting the smoke if they are allowed the free use of open fires, to which in England we are so much attached.

#### *The Question of Cost.*

If the men of science give us satisfactory answers as to the physical possibilities, the question then becomes one of cost. Suppose that the cost amounts to the equivalent of a tenpenny rate. Would ratepayers be willing to expend a sum of that magnitude for the purpose of eliminating smoke from the atmosphere of London or Manchester?

In considering this aspect of the question it should be remembered that the result, if successful, would have some economies to set down per contra.

A bad fog in London, according to the *Times*, may cost 5,000% a day for additional gas alone; to that we have to add the loss due to interference with traffic and other incidental items. I have myself no means of estimating the whole cost of a day's fog. I have seen it estimated variously at from 20,000% to 50,000%, and the cost of fogs per annum is set, I think by Mr. Rollo Russell, at from three to five million pounds. If any of these estimates be true, the equivalent of a tenpenny rate would obviously be a very cheap, and to many people, even ratepayers, an agreeable substitute for the smoke of London. Certainly, whatever may be the material damage of a day's fog, the moral and intellectual damage should be reckoned as no inconsiderable addition, and if the indirect results of the dirt of London smoke could be avoided, even an additional tenpenny rate might be found acceptable to a majority of ratepayers.

It ought in fairness to be pointed out that the successful treatment of smoke would not do away with the effects of fog altogether. Under the most favourable circumstances as regards smoke there would still be fog, and probably more fog in London and other large towns than elsewhere, on account of the acid fumes among the products of combustion. The fog would be white, and white fog itself would cause serious interference with road, river, and railway traffic as it does with sea traffic now. But the large number of London fogs that are smoke and nothing else would disappear, and the avoidance of these and the abstraction of the smoke from the others would very largely diminish the losses attributable to fogs.

(To be concluded.)



## NOTES AND COMMENTS.

ALTHOUGH the Germans appear to be as eager to succeed in commerce as in arms, they will not suffer the face of the country to be degraded by such colossal advertising boards as are set up in England with impunity. An Act was passed in the last session of the Prussian Landtag which announces that, "With the object of preventing the disfigurement of places remarkable for their natural beauty, the police authorities are empowered to prohibit outside of towns (*ausserhalb der geschlossenen Ortschaften*) such advertising boards or notices or pictorial devices as disfigure the landscape by means of police regulations issued in accordance with the law of July 30, 1883. Such regulations may apply to particular areas or spots." A similar law was enforced in towns, but it was desired to protect landscapes also. The objection to advertisements was not altogether sentimental, although Germans enjoy their landscapes more sincerely than many other peoples. But it was apprehended that the tourist traffic might be diminished, and a pecuniary loss follow, if the country were allowed to be disfigured. The machinery of the Act is easily put in motion, for all that has to be done is to apply powers which the Legislature believe exist in an Act of 1883.

SIR JAMES CRICHTON BROWNE, M.D., in his address before the Sanitary Institute on the dust problem, gave an account of the experiments of Dr. MACFADYEN and Mr. JOSEPH LUNT to ascertain the number of particles of dust in a given sample of air. Experimenting in the yard of a London house they found that the average number of dust particles present was 300,000 per cubic centimetre, with an occasional rise to 500,000. Transferring the instrument to the roof of the house, a count became impossible, for millions of particles entered the chamber, illustrating the copious pollution of the air produced by chimney smoke. In a room of the house a number of successive counts were made, which ranged from 216,000 to 490,000 per cubic centimetre, but the slightest air current, or even a movement by anyone in the room, produced a temporary rise in the number of particles. When gas is being burnt or when smoking is going on in a room the dust particles increase from thousands to millions. A count was made before and immediately after lighting cigarettes. The number of particles at once rose from 360,000 to an estimated amount of millions in the cubic centimetre. Ten litres of open air in the centre of London, two specimens of which were tested, gave respectively 568,000 and 318,000 dust particles per cubic centimetre, contained eighty-three organisms, of which twenty-eight were moulds and fifty-five bacteria, and taking the lowest result obtained, viz. 318,000 dust particles in the cubic centimetre, it is seen that there was just one organism to every 38,300,000 dust particles present in the air. Ten litres of the air of a room which as the mean of twenty counts gave 350,000 dust particles in a cubic centimetre, contained nineteen organisms, twelve moulds and seven bacteria. In other words, amongst 184,000,000 dust particles only one organism could be detected. The scarcity of bacteria is remarkable, for experiment has demonstrated that from 1 to 22 micro-organisms per litre of air are habitually present in four-roomed houses in excess of those present in the outside air, and that in small tenements of one or two rooms the excess is from 6 to 240 per litre.

## ILLUSTRATIONS.

THE HEADLAND HOTEL, NEWQUAY, CORNWALL.

THIS hotel was erected from the designs of Mr. SILVANUS TREVAIL, F.R.I.B.A., of Truro and Palace Chambers, Westminster, president of the Society of Architects. It is the largest hotel in Cornwall, and is specially intended for the accommodation of the large tourist and holiday traffic which finds its way into this popular Cornish resort. It is particularly ample in the large area set aside for its general reception-rooms. The main lounge hall is over 90 feet in length, and has two spacious annexes opening out of it on either side. Large dining-rooms, drawing, billiard and smoking-rooms absorb

nearly all the remainder of the ground floor; and this from the social advantages that it affords makes the hotel one of the most popular in the West of England.

Above this are three floors of well-appointed bedrooms and sitting-rooms, approached by a very spacious grand staircase, which is fireproof, and also by electric lifts. Electrical energy is generated in the grounds, and is used for lighting and various purposes connected with hotel life, inclusive of the brushing machinery in the hairdresser's saloon.

Placed on a unique site over 5 acres in extent, which forms the neck of land connecting the headland with the mainland, the hotel enjoys the distinction of having an unobstructed sea view from every window. This also gives its guests immediate access to the charming promenade over the headland, which is a natural promontory many acres in extent which juts out into the Atlantic far beyond any other land in the vicinity, from which sea effects and sunsets are special attractions.

The materials used in the construction are local stone with terra-cotta facings. The roofs are of Cornish slate and the joinery throughout is of oak wainscot. The total cost, inclusive of site, engineering, furniture and general equipment, was upwards of 50,000.

The contractor for the building was Mr. ARTHUR CARKEEK, C.C., of Redruth; for the terra-cotta, Mr. HENRY DENNIS, of Ruabon; for the electrical work, Mr. F. H. HEADLEY, of St. Austell; and for most of the furnishing, Messrs. JAMES SHOOLBRED & Co., London.

## A MYTHOLOGICAL SCENE.

IT is remarkable that although JOHN BAPTISTE CIPRIANI was a Florentine he should have received his first instructions in art from HECKFORD, an English painter who had settled in that city. Afterwards while studying in Rome he met Sir WILLIAM CHAMBERS and JOSEPH WILTON the sculptor, and they persuaded him to accompany them to England. BARTOLOZZI, who was also a Florentine, was then in power in London as an engraver, and by his engravings he made CIPRIANI popular. When the Royal Academy was founded CIPRIANI became one of the original members. His paintings on a large scale wanted power. He was more successful in small allegorical designs like those for the royal state carriage and in his drawings, which show exquisite taste. He had Classic precedents for children endeavouring to frighten each other with a gorgon's head. It was allowable for him to utilize the sphinx as it was half a century afterwards by HEINE, who described the being as half brutish and half human—a lioness in trunk and claws, in head and breasts a woman. The winged Pegasus also seems to join in the revels, and we suppose the bird introduced to fill a vacant corner is to be taken as JOVE's eagle. CIPRIANI suggests his strength and his weakness in the design. His boys are equal to ALBANO's or STOTHARD's, but his imaginative beings are failures. The artist's industry was extraordinary, for after his death no less than eleven hundred designs which remained with him were sold at auction. He was the designer of the diploma for Royal Academicians and was presented with a silver cup by his fellow members in return. We may add that the companion print representing the Arts has already been published in *The Architect*.

LYOYD'S BUILDING, FENCHURCH STREET, E.C. CLASSIFICATION ROOM.

APOLLO THEATRE, SHAFTESBURY AVENUE, W.

THE chapel at Swanley Junction, of which an illustration was published in last week's issue, is now in course of erection (the two aisles being left for some future date). The building is being constructed of red brick with Bath stone dressings. The architect is Mr. ALBERT C. FREEMAN, of Clapham. The first contract, which includes the seating, is 1,890*l.*, and is being carried out by Messrs. GODDARD & SONS, of Farnham, and the heating let to Messrs. CHAS. P. KINNELL & Co.



## THE SANITARY INSTITUTE.

THE congress of the Sanitary Institute opened at Manchester on Tuesday, when the inaugural address was delivered by the Right Hon. Earl Egerton of Tatton. His lordship said:—

My first duty is to welcome to Manchester the members of the Sanitary Congress. We have had here recently a meeting to discuss the art of healing disease; we now have to bring before you the not less important art of prevention of disease. It is a truism that the foundation of health is pure air, pure water, pure food and well-arranged dwellings, and that the sound mind in the sound body is the aim of our Institute. Unfortunately, how seldom are all these conditions fulfilled? We have at last begun to recognise that we live an artificial life, and, though we cannot revert to the tent life of the nomads, that many if not all diseases are benefited by the patients being in the open air as much as possible. Our earliest laws on sanitary matters were given to the Jews by Moses to a nation who lived in tents or tabernacles, and modern inquiry has ascertained that the vitality and longevity of the Jews is beyond that of any other nation among whom they have lived, on whatever cause that may arise. "Our position as a nation depends on our national health, and on the endurance and progressive force of our national vitality," says Dr. Richardson, and does not our commercial position, threatened as it is by the vigorous races of North America, and by the trained intellects of Germany, depend on our being roused to greater vigour and adapting ourselves more readily to the change of circumstances produced by the introduction of new races, new motive powers and greater facilities of locomotion?

I regret that I have neither the qualification nor training of an engineer or a physician to give weight to any remarks I may make on sanitary questions, and am unable to follow in the steps of my distinguished scientific predecessors who have taken the chair at previous congresses. I can only speak as a resident in a populous district, and as one responsible for dealing with the dwellings of the poor, and the buildings on my estate connected with our farms, and as one who has taken a humble part in the various legislative measures which have been passed to improve the sanitary condition of our towns and the health of the people during the last forty years.

I can certify to the great sanitary improvements which have been made in the cottages, farms and farm buildings in my collection, and in the water-supply of our country districts, that we have been hardly sufficiently alive to the storage of our rain-water; the sanitary authorities still keep a watchful eye on the necessary supply of fresh air to our agricultural buildings, the cubical contents of our cow-houses and the supply of pure milk.

The water-supply in Manchester, though drawn from two mountain districts, was very inadequate during the exceptional drought of last summer, and the construction of the additional pipes from Thirlmere, which is now in progress and should not be long delayed, will give an ample supply to Manchester and the neighbouring districts.

It seems in vain to dwell on the question of pure air when we see the canopy of smoke daily drifting over the green fields of Cheshire, and sulphuretted hydrogen and chlorine gases affecting the vegetation for many miles round Widnes and Northwich. I served on the Royal Commission on Noxious Gases about twenty-five years ago, and I regret that their recommendations that manufacturers should use the best practicable means for preventing the discharge of all noxious gases into the air have not entirely remedied the injuries done to vegetation. I am afraid, till a new motive power which is not dependent on coal is more generally introduced, we cannot expect to see much improvement. The present law, even when carried out strictly, is inadequate for the purpose of controlling the ordinary consumption of coal required in works and its effects on our atmosphere. The larger use of gas, petroleum and electricity may create such an improvement in this respect as we cannot at present foresee.

I will rather mention in some detail what has been done to improve the purity of our rivers, and specially of those which supply the Ship Canal. The first step to prevent the pollution of the rivers Mersey and Irwell and their tributaries was taken at a conference convened and presided over by myself as chairman of the Canal in January 1888, at which sixteen corporations, forty-eight local boards and ten rural sanitary authorities were represented.

The Rivers Pollution Prevention Act was practically a dead letter, as it was difficult for an authority to bring proof of pollution against polluters outside the area of jurisdiction, and such authority was unwilling to purify its own effluent whilst others on the stream took no steps.

On August 23, 1889, a conference of sanitary authorities was held in the town hall, Manchester, at which I presided, when certain resolutions were passed which were forwarded to the county councils of Lancashire and Cheshire. Both these bodies decided to apply to the Local Government Board under the 14th section of the Local Government Act of 1888. In

December 1890, a local inquiry was held by the officials of the Local Government Board, and the outcome of this inquiry was a provisional order by the Local Government Board in 1891 constituting the joint committee of the rivers Mersey and Irwell.

This led to an application to Parliament for further powers, and since 1893 considerable progress has been made, and manufacturers have generally recognised the necessity for preventing the trade waste being thrown into the rivers and the justice of being required to do so; and the response to the joint committee's request has been without exception loyally carried out, and without the intervention of severer measures.

Solid matter from the works is to a great extent kept out of the rivers, but serious pollution is caused by soluble putrescible organic matters, or partially treated sewage. Much delay has arisen in the adoption by the sanitary authorities of various methods for the removal of such organic matters. Manchester and Salford are now making fair progress.

I am enabled to state what has been done in Manchester from the information furnished me by the Chairman of the rivers committee of the Corporation of Manchester, and by Mr. R. A. Tatton, the chief inspector of the Mersey and Irwell joint committee.

Manchester has constructed a network of sewers, the total length of which amounts to 1,700 miles. These sewers vary from 9 inches in diameter to the main sewer of 14 feet 10½ inches. The total cost for this sewage system serving all the population of over half a million has been upwards of 600,000*l*. These sewers convey daily twenty-six million gallons down to the purification works at Davyhulme. This quantity is enormously increased at times by the storm waters. At present the purification of this sewage is partly but incompletely performed in settling tanks by the help of lime and copperas, the clear effluent being sent into the Ship Canal, and the sludge being sent away to the sea beyond the Mersey bar. To accomplish this result a capital expenditure of over 200,000*l*. has been incurred. In addition a large scheme, founded on the investigations and recommendations of the best chemists and engineers, provides for a series of detritus tanks and septic tanks, in which the insoluble mineral matter in the sewage will be arrested, and as much as possible of the organic sludge digested by anaerobic organisms. In this way the present large expenditure in chemicals will be unnecessary, and the cost of sludge removal greatly reduced. The effluent from these tanks will then pass on to 46 acres of primary aerobic bacteria beds. From these it will be further purified by passing on to 46 acres of secondary beds at Flixton, and finally, if necessary, 100 acres of land are provided to complete the purification. In addition to the 46 acres of bacteria beds at Davyhulme there are also 26 acres of storm filters to be laid down there, which are intended to purify the occasional excessive flow in time of storm, and to serve also as a stand-by for the main bacteria beds. Thus the total capacity of the new works will be to deal with 126 million gallons per twenty-four hours.

The scheme of these beds has been laid out as far as possible on broad and simple lines, so as to promote ease and facility of working. The beds are, with few exceptions, of uniform shape and dimensions and the point of admission of sewage to each bed is in the centre of the longer side adjoining the supply channel, which serves as a rule an equal range of beds on either side, so that in general the distributing centres fall in pairs opposite each other. Supply channels are of adequate width and gradient to permit of delivering the volume of sewage necessary for filling two beds at once on the same channel in the minimum required time by gravitation to each distributing centre in the scheme. The sewage is admitted from the supply channel to a distributing reservoir, from which it flows over a cill or weir of circular form, and thence along channels cut in radiating form over the surface of the bacteria bed. These channels are lined with fine grade material, which tends to arrest suspended matters on its surface, and retain them from entering into the body of the bed. The under-drainage of each bed is also laid out in radial form, the drainage lines converging into a main collecting drain, which is concentric with the distributing weir, and which communicates at each end with manholes, or at the centre with an outlet well, from which the discharges enter the draw-off channel. The under drains are channels formed in the concrete bottom of the bed, covered with stoneware perforated slabs, set in rebates, so as to be flush with the surface of the bottom.

The average depth of the clinkers forming the body of the bacteria beds is 3 feet 4 inches, each bed having a cross fall of 2½ inches, and the space between the radial drainage lines being formed with a ridge in the centre to facilitate the discharge of the final drainage at the bottom. The body of the bacteria beds is composed of furnace clinkers from which the fine material has been removed by screening, and the coarsest material is used for covering more particularly the radial drainage lines and also the concrete bottom as far as practicable. About 12 acres of beds are now in operation, and the



following method of procedure is recommended for the successful working of contact beds:—

1. The bed should be worked very slowly at first in order to allow it to settle down and the bacterial growths to form. In this way there will be less danger of suspended matter finding its way into the body of the bed, while the material is still loose and open.

2. The burden should not be increased till analysis reveals the presence of surplus oxygen, either dissolved or in the form of nitrates in the effluent.

3. Analyses of the air in the bed may usefully be made from time to time during resting periods.

4. The variations in capacity should be carefully recorded. If the capacity is found to be rapidly decreasing a period of rest should be allowed.

5. Long periods of rest should be avoided during winter, as when deprived of the heat of the sewage the activity of the organisms decreases. If necessary the burden on the bed should then be decreased by reducing the number of fillings per day, rather than by giving a long rest at one time.

6. The insoluble suspended matter should be retained on the surface by covering, at any rate, a portion of the latter with a layer of finer material not more than 3 inches in depth. The suspended matter thus arrested should not be raked into the bed, but when its amount becomes excessive it should be scraped off. This should be done if possible in dry, warm weather, after the bed has rested some days. By placing the inlet and outlet penstocks (or sluices) as close together as possible the suspended matter will tend to concentrate in their vicinity, and its removal will be facilitated.

The total capital expenditure on sewers and purifying works in Manchester and neighbourhood will amount to 1,300,000*l.*, or rather less than 2*l.* 10*s.* per head of the population served.

With regard to the other local authorities in the Mersey and Irwell watershed, alumino ferric is used by nearly half the boroughs and district councils as a precipitant; nearly one-third use no precipitant at all. The sludge is mostly disposed of on the land, being either given or occasionally sold to the farmers as manure. Rochdale, Bury and Withington are also constructing new works on bacteria beds.

I desire to call special attention to the successful working of the joint committee in Lancashire and Cheshire, and to press upon the Government that similar legislation to that which is now confined to those counties and Yorkshire should be extended to the whole country and made compulsory. The manufacturers in these counties feel that all similar traders in the kingdom should be compelled to treat their trade waste in the same way, as the cost of treatment is a definite charge on the cost of production and should therefore be general.

The outlay by the manufacturers has been considerable, probably not less than 300,000*l.*, but the improvement of the river water is itself an important benefit to them when river water is used for manufacturing purposes.

The Royal Commission on Sewage is of opinion "that the general protection of our rivers is a matter of such grave concern as to demand the creation of a separate commission or a new department of the Local Government Board, which shall be a supreme rivers authority dealing with matters relating to rivers and their purification, and which, when appeal is made to them, shall have power to take action in cases where the local authorities have failed to do so."

We have in this great city triumphs of engineering and mechanical art applied to various industries, but the population which inhabits it has, as in other large towns, degenerated in size and physical power from the ancestor or progenitor who was attracted into the town by higher wages from the country districts. The same process is still going on, the large percentage of rejections from physical disabilities among those who offer themselves as recruits, even in Manchester itself, gives an alarming proof of the degeneracy of the town population. One of our great problems is to arrest this deterioration and to make up for the necessary drawbacks of town life by greater care in the physical education of the young, and in teaching them the principles of hygiene or the preservation of health. Though it is given to many of no great physical strength to succeed in the race of life, and by sheer brain power to triumph over physical weakness, yet in most cases a strong physical frame is necessary to supplement the endowment of the mind in most of the careers open to man. There are many other questions bearing upon the national health which will be profitably discussed during the present Congress. I have only attempted to deal, however inadequately, with a small portion of the large field open to me, and only with those subjects with which I have been personally brought into contact. I will only mention one further point which I think bears on the sanitary condition of the country. We are suffering from overcrowding in our towns, partly from the want of employment in our agricultural districts owing to the increased surface of land laid down to grass, and to the growing of corn being no longer as profitable as it used to be. It would be a great relief to that class if greater emigration were

to take place to our Colonies, where they would furnish with good customers for our goods and send us further supplies of the raw material for the food that we require. Canada and our other Colonies are being brought closer to us by the devotion they have shown to the mother country in the late war, and there is in the North-west of Canada a country which, when fully opened out by new settlers, would supply us with all the wheat we require.

South Africa is also an attractive field for all classes, both men and women, and there under a fine climate, and with the soil improved by systematic irrigation and opened out by railways, there is an opening for our farming class and for skilled artisans in all trades in the towns. In that country many of the delicate classes of our children, especially those with a tendency to consumption, would recover health if they were sent out by our Guardians, or emigrated with their parents at an early age. They would soon be able to earn their own livelihood in the purer air of the African highlands instead of being a burden and considerable expense to the country in our hospitals at home. I trust that this is not merely an imaginary picture, but one which might be carried out to the great advantage of our country and to many of those who are not strong enough to face the severe competition in our labour market at home.

There may be considerable ignorance in this country on sanitary questions, which it is the desire of the Congress to remove and enlighten, but at least we are far in advance in sanitary matters of other European nations, as far as my experience goes, and any improvements in sanitary matters in the hotels abroad have been borrowed from England to meet the requirements of English visitors.

In conclusion, I should like to express a hope that our deliberations may pave the way by improved sanitary conditions to the greater vigour and regeneration of our fellow countrymen, that we may not fall behind any of our competitors in either Europe or America by any decay in our race and as our soldiers have not shown themselves inferior in pluck or endurance in our recent war to any of their ancestors who have carried the English flag round the world, so our artisan may still hold their supremacy, both in skill and in physical strength, by a recognition of those sanitary laws which it is folly to ignore or disregard, and which it is the object of this Congress to make known.

## WEIMAR.

IT is notable how Thuringen flattens and grows dull as you approach its capital. If you are coming from Eisenach says the *Scotsman*, you will find nothing in the country around Weimar to compete with recent memories of the Wartburg, and, if you have travelled up through Jena out of the heart of the Thuringian Forest, you will find that the trees have receded and the hills smoothed themselves out before half-way is reached. The villages seem to lie less picturesquely; there are no memories of battles; the land is striped monotonously with grain and grass. And when you arrive and pass through the station square, past the bright line of 'buses into the newer streets, this disappointing impression is at first hardly lightened. There are no spires in the distance with a promise of better things. The few churches you pass have the clipped, Protestant look, so familiar in the reformed parts of Germany. The houses are not even strikingly ugly, and there are no extravagances of the new art of the country to amuse the traveller. The respectability of modern Weimar has resisted all attempts at comic relief. Only a certain slow dignity in the minor officials one meets at every turn, and a note of wilful elegance about the shop-fronts proclaim that you are in the capital of a country with a sovereign and a court of its own.

But when the dreary museum buildings and the usual hideous memorials of the patriotism of 1870 are left behind, the older and more sympathetic Weimar begins to uphold itself. Long, calm, white house-fronts line the pavements. The walls are decorated with touches of graceful eighteenth-century stucco in festoons and medallions, and the carved double doors are bright with well-polished old brass mountings. The attractions of the town seem to lie all in the past. It has not, like Jena, made for itself a bustling and a brilliant present. There is no university to keep it before the eyes of the intellectual world, and it is no longer the centre of movements and traditions. Even if it were to produce a new race of poets, or another statesman of genius, their name and fame would necessarily be transferred to other places, and even the advantage of being a capital city has very greatly diminished since the establishment of the Empire. It remains a blameless town, as towns go; is valued as an excellent place for boarding schools, and presents all the outward signs of progress. You may buy the latest Coronation portraits of their Britannic Majesties at any stationer's, and eat a passably cooked dinner in a perfectly modern restaurant whose frescoed walls are one



list of poppies, and whose very spittoons reflect the latest art fashions from Munich.

But somehow there is no great temptation to linger among these splendours, and one even forgets them as one turns to reminiscences of the past. The memories of Weimar are in a manner more individually distinct, more definitely linked into the chain of historical causes and events than those of Jena. There is a glitter of high politics about all the gay literary life of Weimar at its best. One remembers Goethe as the Minister of State, and does not forget that Sachsen-Weimar afforded the very first example of a German constitution. And whatever may be the transcendent glory of Goethe and Schiller, the Dioscuri of Germany in her troubled days, they always group themselves in any true perspective of history as the subjects of the great statesman and ruler, the Grandduke Carl August. This potentate appears to have been a man of many reputations. But as one looks at his genial portraits, the impression is rather that of the lettered and jovial sovereign, the companion of poets, the distinguished amateur, than of the wise diplomatist, who not only saved his Duchy from the consequences of the catastrophe of 1806, but by his liberal ruling and generous political ideals created the nucleus of the patriotism which was strong enough, a little later, to overthrow Napoleon himself.

It was the presence of his Court which made Weimar from a dull provincial capital into one of the most brilliant towns in Germany, and which filled it with the memories which make it worth while to this day to wander through its streets in search of fragments of the past. The relics of the State kept in those brilliant fifty-three years are concentrated in a little group of palaces which stand within hearing of the clamour of the market-place, and among the first trees of the grand ducal park. A little apart is the palace of to-day, the usual quadrangular structure, with high gilt-topped railings and sentinels in spiked helmets in front. It was built for Carl August under the superintendence of Goethe, and is otherwise uninteresting. But near by is a smaller, less pretentious building, without gates or courtyard. It is the French palace of old times, and since Goethe's day the grand ducal library. Here you may see in all manner of museum treasures, a sixteenth-century automaton made for a little prince of Weimar, who afterwards devoted all his leisure to turning ivory and carving cherry-stones; a model warship built in Holland by Peter the Great; Wallenstein's gala uniform and high boots; Goethe's own ministerial evening coat and the blue silk Japanese dressing-gown, clad in which he is said to have given readings of "Werther" to a circle of young lady admirers. The whole place is full of association with the prime of Weimar and the best days of Goethe's life. Under his direction the palace was transformed into a library and museum, the lighting was arranged so as to display pictures and sculptures to the best advantage; and the perfect arrangement of the collections, undisturbed almost as he left it, bears witness to his exquisite sensibility in the ordering of even the smallest details. And there are more tangible souvenirs. In the large library hall on the first floor, between the white and gold pillars, there was given a memorable performance of his "Iphigenie." The Grand Duke himself played Orestes, and all the other performers were members of the Court circle. Goethe acted as stage manager and audience. In this very room, too, is the "sacred floor," as the custodian puts it (and somehow it doesn't sound absurd) where Goethe stood one September night contemplating the exhumed bones of Schiller, which lay there awaiting transference to the vault of the princes of the house of Weimar.

The world has made inroads on the French palace since the days of Carl August. Time was when it lay quite in the seclusion of trees, and the surrounding part was "a paradise open only to princes and to poets," and now a broad new avenue has been cut right through, and the traffic rattles by on its way to the railway station. But you may still go to the window of Goethe's workroom in the upper storey, and look across to the house where Frau von Stein used to live, and where so much poetry was inspired. You reach a new, more vivid understanding of the life that was lived in those days, and details group themselves and build up a picture. Of Goethe's passage there are innumerable traces. It is remembered how he used to make ministerial journeys through the duchy, and how he would keep a sheet of MSS. underneath his official papers and add a verse or two to "Iphigenie" between the entries of rent and taxes. And even bills are still preserved wherein it appears that his Government frequently disallowed superfluous groschen, as beyond the modest state in which a Minister was expected to travel. You come on all manner of memories of the love affairs, pictures, verses, locketts, poetry-books, of the platonic passages, half-stately, half-tender, finissant par la main baisée, which passed in that age which had not forgotten the eighteenth century in its eager welcome of the nineteenth.

The historic sights of Weimar are scattered things. You may do what your guide-book tells you, and walk through the prescribed streets. You will find the park pretty and the older

town mildly quaint. But only here and there, as when you come upon Goethe's garden house, or reach Schloss Belvedere, the scene of so many grand ducal festivities in the great days, do you experience that quickened thrill of interest to gain which it is worth while to spend hours of blinding heat in a German third-class railway carriage. Still Weimar to this day makes a gallant struggle against the commonplace; and those who interest themselves in music or philosophy will turn reverently towards the town which contains the villa of Franz Liszt, and which a year or two ago witnessed the infinite tragedy of the last days of Friederich Nietzsche. The theatre, too, is there, to remind you of the most brilliant dramatic past in Germany. The laurel crowns bestowed on the first nights of "Faust" and "Wallenstein" are still to be seen in the museum; and here, in 1850, Liszt directed the first performance of "Lohengrin."

But the crown of all the attractions of Weimar, the memory of memories, is of course preserved in the two houses where Schiller and Goethe lived and died. Schiller's house is a modest building in the style of the century before last, retreating a little from the line of its more modern neighbours. It cost 300*l.* when it was new, and Schiller lived there the last five years of his life. You may see the apartments where Schiller wrote and received his company, a few relics, and lastly, the room in which he died. All is in the highest degree austere and dignified. The simplicity of these bare rooms has a real pathos of its own, and the well-read, impressionable tourist has sometimes been moved to the verge of tears at the thought of the struggles and the cares reflected there. But it is perhaps with a truer insight that others see in Schiller's house the habitation of a philosophically given and impersonal genius, one who never depended much on his immediate environment, and for whom it was impossible to spend hours caressing bibelots or lingering over title-pages. And in recognising this air of pure intellectual distinction which still hovers about Schiller's surviving possessions, one finds at last both the true meaning of his greatness and the reason why he is often unsympathetic to English readers.

Goethe's house makes a different impression. It looks important, even splendid. The street widens out respectfully before it, and it appears to fill the whole of one side of a square of less distinguished buildings. The long rows of windows suggest stately rooms lying behind. The dignified front door with its flight of steps seems still expectant of grand ducal carriages, and the whole house suggests the statesman, the minister, the intimate of sovereigns.

But, as you enter, this impression disappears in a keen and vivid realisation of Goethe himself. Any idea of a purely official prominence is happily eclipsed, and when you have passed the few pieces of sculpture on the plain unadorned staircase you reach no interior of cold stateliness. The rooms are smaller than one expected; any shooting lodge in Scotland possesses a larger dining-room than Goethe had. But they are full of the traces of his presence, and of his friendships and of his pursuits. The pictures, family portraits, friends, the reigning family, the great men of his day, hang just as he had them. The furniture, in the simple German rendering of the first Empire style, is just as he left it. The very decorations were chosen by him. A wise and pious management has decreed that, so far as possible, all shall remain as it used to be, and several of the rooms look as if they awaited his return from a journey.

His collections have been arranged more on the usual plan of a museum. There are royal gifts, laurel crowns of gold presented by admiring towns and communities, drawings by himself, silhouettes, the collections he made in Italy, precious and curious souvenirs; and among all the testimonies of admirers there is one which above the others is interesting to the travelling English. It is a long dark lock of hair, secured to a sheet of that old-fashioned embossed paper on which valentines used to be written. And on the paper is inscribed a quotation in a fine Italian hand dedicating the tress to Goethe, dated from Craigenputtock and signed Jane W. B. Carlyle. It is not the highest form of hero worship which lingers over the material surroundings of dead genius. But in the case of such a man as Goethe, who impresses the imagination with every one of the visible signs of greatness, the sight of the objects with which he was daily familiar is irresistibly affecting. And so the culmination of the visit to his house is naturally the room in which he wrote and thought in his last days. His desk, his chair, the books to which he would refer, the table at which he sat and dictated to Eckermann in the last year of all; and across the room the glimpse of the small bedroom, the bed, one elbow chair and the light of a little window, make an impression which can never be forgotten. The custodian arouses you with a tag. "Alles ist vergänglich," he says; and if you are a wise sightseer, you will refuse the invitation to view Frau von Goethe's roomy wardrobes in the garret above. You will leave the house and leave Weimar with the consciousness that now they have indeed nothing more to show.



## ASYLUM BUILDING IN ENGLAND AND SCOTLAND.

BY desire of the Edinburgh District Lunacy Board, Mr. George T. Hine has examined the plans prepared by Mr. H. J. Blanc for the new Bangour Asylum, in order to ascertain whether the cost could be reduced, &c. The following report to the clerk has been prepared on the subject:—

Referring to your Board's remit and our correspondence on the subject, I have at length completed my investigations and examination of the drawings and specifications of this building, submitted by Mr. Blanc, and have also carefully perused the various reports of your special committee and others relating to the matter, and am in a position to now formally reply to your letter of May 19 last. I have also, as you are aware, visited the site at Bangour in company with the chairman of your Board, Sir John Sibbald, your architect, and yourself, and have since spent much time in examining examples of different forms of building construction and obtaining particulars and prices of various classes of work in Scotland, and now beg leave to report to your Board as follows:—I should first explain that I understand from your reply to my inquiry of June 10 that the fourth instruction of your Board in their remit, viz.:—"and generally to advise the Board in the matter"—is not intended to invite my criticisms on the general scheme or principle of design, which, together with the site, have been determined and approved by your Board; I have, therefore, limited my inquiry to matters of construction as affecting the cost of the buildings which have been determined and approved by your Board. I desire to express my admiration of Mr. Blanc's designs generally, which, in my opinion, show evidence of the greatest consideration and most patient labour on the part of the architect and your Board's advisers. Whatever success may attend the working of an asylum in this country designed wholly on the villa system, I can say with confidence that the present drawings, if carried out in their integrity, could not fail to produce a building which would be an ornament to your country and a landmark in the history of asylum planning; and if, in furthering your endeavours to effect economies, I am called upon to recommend alterations which may have the result of marring the beauty of Mr. Blanc's designs, I shall do so with the greatest regret, particularly as I know that he must have spent an enormous amount of time and trouble in bringing them to their present state of completion. I desire also to say that I have very carefully studied the report of your special committee, and am in full sympathy with their endeavours to effect economies, and fully appreciate the very great amount of labour they have bestowed in arriving at the conclusions set forth in their report. The question of the cost of our asylums has of late years exercised the minds of many local authorities responsible for the erection of these buildings, as well as those members of H.M. Government who have the chief control of asylum matters and the expenditure of public money. I have been frequently called in to advise how this expenditure could be curtailed without prejudice to the proper treatment of lunatic patients, and am, therefore, in a position to thoroughly appreciate the efforts of your special committee, and hope to be able to advise you with a satisfactory result.

To your Board's first inquiry, "Whether the plans can be modified or remodelled so as to reduce the total cost to a sum representing 300*l.* per bed or less?" I would reply in the affirmative, subject to the following observations:—(1) I understand that the cost per bed referred to is intended to include only the cost of building works and engineering fittings, roads, drainage and sewage tanks, architect's and surveyor's commissions and furnishing; but excluding laying-out and planting the grounds, water supply, railway works and, of course, the cost of land and attendant expenses. (2) I also understand that in putting the cost at 300*l.* per bed, you refer to the completed asylum of 1,000 patients, and not to the buildings proposed to be erected in the first instance, which comprise an administrative department, including kitchen and stores, together with recreation hall, chapel, workshops, laundry and officers' residences, sufficient for an asylum for 1,000 patients, but with homes or wards sufficient only for 600 patients. Generally speaking, when considering the cost of an asylum it is broadly estimated that the patients' blocks account for half the total cost of the asylum, the other half being absorbed by the administrative and other buildings; and, therefore, in arriving at the cost per bed of the buildings erected in the first instance, comprising patients' quarters for 600 and administrative buildings for 1,000, you ought to divide the total cost by 800 (the mean between 600 and 1,000) to arrive at a fair estimate of the cost per bed. In replying, therefore, to your first question, I say it would be reasonable to limit the cost to 300*l.* per bed for the completed asylum of 1,000, or in forming an estimate of the cost per bed of the buildings erected in the first instance you must divide the total cost by 800. I should further point out that in speaking of the cost of the buildings of an asylum it is not usual to include furniture, which is a

matter of equipment not generally under the architect's control. In my own practice I make a rule of including in my estimates only such matters as I am responsible for, and if you observe this rule in the present case and deduct the 20*l.* per bed for furnishing, which is tacked on to the buildings estimate, it would reduce the price per bed in the present inquiry to 280*l.*—a most unreasonable limit to fix for all works under the architect's control. I will explain later on how I propose to reduce the cost of the buildings, but will first reply to your other questions.

2. "Whether the plans can be adapted to brick harled." In an architectural sense there is no difficulty in retaining the present designs so far as the plans are concerned, and adapting to them elevations suitable to brick harled work, but whether the same drawings can be utilised is another matter. Probably Mr. Blanc would find it simpler to redraw, at least, all the sections and elevations than to alter the existing ones. This, however, is a matter of detail which may be left to the architect.

3. "Whether by building with brick harled the cost will be reduced to any, and if so to what, extent?" This question has involved much consideration and also inquiry into the cost of various classes of work, followed by many measurements and calculations, with the result that I am now in a position to give you a fairly approximate estimate of the saving that might be effected by substituting brickwork harled for the present stone treatment of the outer walling, basing my estimate on the comparative value of the two classes of work when applied to the cubic contents of the buildings as already designed. I should also state that, for my own satisfaction, I have not accepted the figures supplied me by Mr. Blanc, but have remeasured the whole of the buildings myself, but without, however, finding any material difference. My estimate must, however, be accepted with some reserve, for the reason that the whole of Mr. Blanc's working drawings are not yet completed, and have had to refer to the competition drawings of several buildings, viz. the recreation hall, church, nurses' home, attendant cottages and the mortuary and pathological buildings, in order to complete my investigations.

You will understand that to give you anything approaching an exact estimate of the cost of your asylum in the two forms of construction would necessitate the preparation of numerous further drawings and schedules, which would prove a very lengthy and costly procedure, and which I assume you do not desire. I have, however, prepared a drawing of one of the blocks, viz. the home for thirty-two patients, taking Mr. Blanc's plan, and erecting from it elevations illustrative of a brick harled treatment of the simplest form of design, with no stone dressings to windows or doorways, but showing the harled treatment on the in-goings of the window openings, this being the form of construction on which I have based my estimate of the saving to be effected by adopting what I shall call in future reference the "simplest form of brick-harled treatment." If you refer to this drawing you will see that the whole character of the building is changed. All stone dressings are entirely dispensed with, excepting the window-sills; the windows are of the ordinary type of double-hung sashes and frames, the roofs are covered with slates of an inexpensive character from Ballachulish or Easdale, and the walling of brick or whinstone rubble, harled as before described. I have made, moreover, one alteration in the plan, but only to illustrate what might be done in the way of reducing the size of these buildings to their narrowest limits, viz. I have provided for the nurses' rooms on the second floor of the one wing, instead of taking up the whole building to a uniform height with the nurses' rooms in the centre, leaving the remainder waste space as shown in Mr. Blanc's design. This alteration makes the building more compact, and reduces its cubic capacity by about 20,000 feet. It is, however, intended only as a suggestion of what might be done with some of the other buildings to assist in keeping down the cost; but I have not considered this in preparing my estimates, but have measured the buildings as at present planned. I should also state that I have considered it necessary, in order to keep down the cost to the figure given, to vary the internal treatment of the buildings, denuding them of all ornamental or unnecessarily expensive fittings, omitting wooden dadoes in the rooms and substituting a chair rail at dado height, with cement face to the wall below and a plain skirting. I have also assumed the substitution of granolithic or papyrolith flooring in the lavatories, w.c.s, passages and other rooms and lobbies for the more expensive paving specified in Mr. Blanc's design. The lavatory and other sanitary fittings must be of sound but plain construction, and the fittings and finishings generally of the character adopted in the most recently erected London County asylums. Without, however, burdening you with a technical description of all the details, I wish you to understand that in this "simplest form of brick harled treatment" everything is assumed to be of the plainest character consistent with sound and durable construction. Assuming that the whole of Mr. Blanc's buildings for the completed asylum of 1,000 patients were remodelled and constructed as thus described, I am of



union that the cost might be reduced to 292,000*l.*, or 292*l.* per bed, including furnishing at the rate of 20*l.* per bed.

Having thus answered your three questions in a categorical sense, I will proceed to deal with your fourth instruction, and advise you generally in the matter." In the first place, I think it right to remind you that asylum construction has of late years undergone a marked evolution, and, in the laudable desire to assist in the cure of lunacy, experts in asylum construction have not always restricted themselves to cost in erecting and fitting up buildings best adapted to the treatment of the insane, and in this respect Scotland has certainly not been behindhand compared with other countries. The result of these endeavours to produce the most suitable buildings has led to a somewhat lavish display of decorative treatment, as is evidenced in the three modern asylums of Gartloch, Hawkhead and Hartwood, compared with which buildings Mr. Blanc's designs are certainly moderate, and show no undue extravagance, and I should therefore say that, without any distinct instructions to work on different lines, he was perhaps justified in following the lead of these asylums to the extent he appears to have done. I should further remind you that in erecting asylums, which are in the nature of Government buildings, the simplest construction and greatest durability should be aimed at, and that you would be erring in the other direction if you allowed your buildings to be erected after the manner of second-class suburban villas.

While investigating the different forms of construction in the neighbourhood of Edinburgh, I found that where harling was done it was only in quite the lower class of property that brickwork was used as a basis of construction, and in the better class property stone, which is the natural building material of the country, was used as a foundation for the harling. Further, I find that the cost of plain rubble walling is generally less than brick walling of equal thickness, and no more than brick walling 18 inches thick, which in England is regarded as a standard thickness for buildings of this class. I should further point out that the greater cost of stone buildings does not lie much in the walling as in the freestone dressings to windows and doorways, together with the copings, cornices, string-courses and other decorative features; and therefore the greater saving which it is possible to effect in the outer construction of these buildings does not depend so much on the substitution of brick for stone, or of harling for rubble facing, as in the omission of the freestone dressings, which, as I am going to show you, can be practically done away with without sacrificing constructional soundness and, not necessarily, much architectural effect. I have ascertained that, by using a little extra care in selecting and trimming the facing stones and neatly pointing the joints, plain rubble walling, with larger stones selected and trimmed for the rybats, may be executed at a cost that will not materially exceed the cost of harling, and with a result immeasurably superior to mere harled work, giving a substantial and lasting appearance, and involving little or no cost in upkeep, as in the case of harled work, which requires recolouring from time to time and occasionally renewing or repairing. Having regard, therefore, to the character and appearance of your proposed buildings, and to their substantiality and durability, I should advise that the present character be adhered to, simply denuding them of all expensive dressed freestone work where possible, and treating the walling and window openings in the way I have described. This will allow the existing drawings to be used, with some few alterations, and the present schedules can possibly be retained, so far as the quantities are concerned, by altering the descriptions and cutting out the freestone work altogether, with such of the minor fittings as are of an expensive character, and which you may think it desirable to do away with. If this is carefully done, and the pruning knife used somewhat unsparingly, I am of opinion that the total cost might be reduced to show an average rate of 300*l.* a bed, possibly less excluding the furniture, and in this way there will be comparatively little loss of time, which I understand is an important consideration.

If it is a fact that you are very seriously pressed for accommodation for your patients, I think it would be wise to proceed at once with the erection of the infirmary and administrative block, the drawings of which are already completed, and, as I understand, the schedules also. This block will give you accommodation for 40 male and 40 female patients, together with quarters for a certain number of officers and staff, with offices, kitchen, &c., without which it would be impossible to work any building as an asylum. The alterations to the drawings and schedules of this one block, sufficient to bring them within the terms of my recommendation, ought to be easily effected in about a couple or three months, which would allow you to commence building operations before the end of the present year. By adopting this course you will have an opportunity of testing the effect of the alterations I have suggested, and will be able to form a fairly accurate estimate of the total cost of the asylum treated in the same way before you commit yourselves to the principle generally.

I gather that it is not within the limit of my instructions to

criticise the design of these buildings, but I think I shall be allowed to suggest alterations in the plans of any buildings for which working drawings are not yet prepared, such as the recreation hall, which, in my opinion, is unnecessarily large for an asylum for only 1,000 patients. The floor area as designed covers nearly 8,000 feet, whereas in none of the London asylums, which all accommodate 2,000 patients or more, has the recreation hall a floor space of more than 7,200 feet, and in many cases less. In one of my latest asylums, which is designed ultimately for 1,250 patients, the recreation hall has an area of a little over 5,000 feet, and in your case a room of similar size ought to be large enough for your prospective requirements. Further, I may say that for asylum purposes a church of less pretensions than appear in the design submitted by Mr. Blanc in the competition would answer every purpose, and the medical treatment of the patients would not suffer in consequence. Indeed, I should state that in framing my estimate I have calculated for a church of simple design as well as a recreation hall of more moderate dimensions.

I ought also to state that in preparing my estimate I have given my careful consideration to Mr. Blanc's estimate of "further relative works" as set forth on page 6 of your report of December 1, 1901, and have amended these wherever I considered them excessive or insufficient. Further, in his estimate of "Furnishings, fees, &c.," on page 7 of the same report, I have reduced Mr. Blanc's commission to correspond with the reduced cost and also the measurer's fees, which are shown on the completed asylum to amount to 14,000*l.*, but there is probably something else included in this item, as in England a commission of 1½ per cent. on the cost, with some further allowance for printing, would be considered ample for this purpose. I may further state that in studying the reports submitted to me I noted the very reasonable suggestions of the Medical Commissioners of April 23, 1901, and think that Mr. Blanc should give consideration to them and amend his drawings accordingly. The Medical Commissioners conclude their memorandum by referring to the provisions to be made for escape in case of fire. If not going beyond my instructions, I should like to state that the English Lunacy Commissioners require that alternative ways of escape shall be provided from all dormitories—that is, two doorways to each room and two staircases in each block, one at either end, so that in case of fire in any portion of the building every patient can escape either one way or the other. I think Mr. Blanc's designs would be improved by the adoption of this principle.

In the report of your special committee some useful suggestions are offered—particularly No. 4—as to size of workshops and other buildings, but I do not think that much is to be gained by adopting their fifth suggestion. Very little will be saved in point of cost by increasing the accommodation of the homes to sixty, and in an asylum for only 1,000 patients I am distinctly of opinion that the utility of these buildings would suffer materially by thus increasing them, inasmuch as the opportunities for classification and segregation would thereby be seriously restricted. In conclusion, I beg to summarise my replies to your inquiries and my recommendations as follows:—

#### Summary.

1. "Whether the plans can be modified or remodelled so as to reduce the total cost to a sum representing 300*l.* per bed or less?"

My answer to this is, "Yes, subject to my correctly interpreting your meaning of price per bed."

2. "Whether the plans can be adapted to brick harled?"

To this I again reply in the affirmative.

3. "Whether by building with brick harled the cost will be reduced to any, and, if so, to what extent?"

I say in answer to this that by adopting the simplest form of brick harled treatment the cost may be reduced to something less than 300*l.* a bed.

4. "To advise the Board generally in the matter."

My advice is

(a) To adhere to stone construction, but in a less expensive form, and to modify the interior treatment of the different buildings, cutting down the cost in all legitimate ways. By doing this a more suitable form of construction than brick harled will be obtained at comparatively little extra cost, and much time and expense in other ways will be saved.

(b) To commence building operations at once by erecting the infirmary and administrative block. This will test the cost and suitability of the form of construction recommended, and relieve to some extent the urgent pressure for accommodation.

At the meeting of the Edinburgh District Lunacy Commissioners on Tuesday it was decided to act on the recommendations of Mr. Hine, and that Mr. Blanc was to consult with Mr. Hine and amend the plans, specifications and schedules in accordance with their views, to advertise for offers and to report.



## THE CHICHESTER CAMPANILE.

THE following report on the detached campanile at Chichester has been prepared by Mr. Somers Clarke at the request of the executive committee for the repair and restoration of the cathedral:—

The walls of the tower are in a splendid state, solid and sound. I cannot detect a crack or settlement in any part. It is the surface only that has suffered, and this has been eaten away by the weather to a depth in some places of several inches. The tops of the four-angle turrets, and the parapets both of the octagonal stage and of the square top of the tower, need attention.

The tower was originally faced with stone from Quarr Abbey—also known as Binstead stone—from near Ryde, Isle of Wight. In the fifteenth century this stone was a good deal used in the South of England, and may be found at Winchester Cathedral and other places. It is a limestone of not very enduring quality. The quarry is now closed and is said to have been exhausted.

Seeing that this tower is one of the latest of the cathedral buildings, dating from the fifteenth century, and that its surface has perished far more seriously than the surfaces of some of the oldest parts of the cathedral, it would be a folly to reopen the quarry on the chance of finding more of the indifferent material. It will be better to use where it is necessary a stone which has already been tried and not found wanting.

It would be an easy though perhaps an expensive remedy to recase the exterior of the tower.

By doing this very much of that look of majestic and venerable age, by which this tower is especially to be remarked, would be lost.

We should have a new tower and not the old one.

More especially would this be the case if the angle turrets and parapet of the octagon are seriously interfered with by fanciful restoration.

Certain old prints and drawings show us that at one time the angle turrets were crowned with a battlemented parapet. The evidence thus given does not, however, go so far back as to prove to us what was the original crowning feature of these turrets. Probably there were battlements.

It is quite certain that the existing parapet of the octagon is not now in its original state.

It was a pierced parapet, higher than it now is; but what was its height? Whether it had or had not pinnacles or other features at the angles cannot be told.

Is it not better to preserve what we have rather than to launch upon fantastic flights of restoration, in effecting which the little evidence we have will be destroyed?

I most strongly urge that the chapter accepts things as they are, and puts "restoration" far from it.

It will be impossible to avoid putting some new stone in the upper parts of the angle turrets.

The stone is in some cases flaking away and falling, sometimes in powder and sometimes in pieces of considerable size, so large as to be a source of danger.

It would be a good thing to place some iron hurdles round the tower, to prevent people loitering too near its base.

The parapets of the square tower top have been patched up at different times with Portland stone and are now falling to pieces; parts are, indeed, quite insecure.

The lead gutters behind these parapets are much dilapidated. It would be well to replace them with asphalt, which, once properly laid, is practically everlasting, and is a much greater security against wet and frost than leadwork.

In the tower there now stands a long flagstaff. This was, I understand, to have been placed on the top of the octagon roof secured to its roof timbers.

In some of the old drawings there are indications that a small pinnacle or spirelet stood up from the middle of the roof, but an ugly stalk of a flagstaff would not only be at variance with the grave horizontal lines of the tower itself, but would be a source of insecurity. The action of the wind on a long staff, even without a flag, is incessant. It worries the timberwork, and if stays be attached, as they have been in times past, to the angle turrets (structures not very solid in themselves) their masonry suffers.

If it is desired to set up a flagstaff it would be best to place its foot alongside the base of one of the angle turrets, and to steady it by short stays attached to the octagonal stage of the tower. The piece of the flagstaff on which the wind could act would then be comparatively short, and would not be a source of danger either to the roofs or the masonry.

As regards the preservation of the surfaces of the masonry of the tower, it is desirable that every effort should be made to indurate the surfaces of the existing stonework, only setting in new stones where they are absolutely necessary.

Professor Church (professor of chemistry, Royal Academy) has of late years turned his attention to the induration of stonework decayed by weather and the vitiated air of towns. He has satisfied himself that a solution of baryta is very efficacious, and at the instance of the Office of Works has made experi-

ments at Westminster Abbey, where the carvings and surfaces at the chapter-house were disintegrating very rapidly. There is certainly no better authority to which we can go than to him.

Specimens of dust from decaying surfaces of the bell tower have been sent to him. These he has analysed, and of opinion that the baryta solution may very properly be applied.

Professor Church recommends that the application should first be made on the north face of the tower. The builder has been instructed to set up a small platform, its floor level with the top of the plinth, and with boards arranged above it sloping roof, so that should any pieces fall from above they will not come directly on the heads of those applying the solution. Full details of the method of application and a machine with which to do it are in the hands of Prebendary Bennet.

If the solution solidifies the surfaces of many of the crumbling stones, it is obvious that very much money may be saved, whilst the tower will retain its appearance of venerable antiquity.

Until the efficacy of the solution has been tested it will not be desirable to begin any system of repair to the masonry by inserting new stones. Beyond small pieces coming off there is nothing to fear.

When the effect of the solution has been ascertained in some nine or ten months' time, the complete repair and statement of masonry where it is necessary could be taken in hand.

## SANITARY PROGRESS.\*

MY first duty is to thank you, and through you the Council of the Sanitary Institute, for the honour you have done me in electing me to fill this chair.

For my own part, I do not know whether it is altogether the best selection that could be made, for on the one hand I conceive that these congresses should to a large extent invite the criticism and suggestions of those public men who are professionally connected with the great and important subject with which most of us present are continually dealing; and on the other hand, I feel that I can claim to bring before you novel views, and were I left to my own inclinations, would prefer to sit as a listener that I might perhaps benefit by your deliberations.

Looking back at the advances in sanitary science which we have witnessed during the past forty years of my professional life, I must congratulate the Sanitary Institute on the great success which has followed their endeavours in promoting the health and happiness of the people of this country. Compared with forty years ago, the cleanliness and sanitation of our large towns has wonderfully improved; but not only is this the case, for there has grown up in the public mind during that period a conviction that it is only by the rigid enforcement of proper sanitary regulations that the public health can be preserved. Much has been learnt and many theories have disappeared. Increased experience led us to look at the subject from a practical rather than a theoretical point of view, and the main directions in which advances have been made are by endeavouring to conform to the great laws of nature which govern the removal of dead organic matter and the preservation in a state of purity of the air we breathe and the water we drink.

At an early period it was seen that it was dangerous to public health to live in the immediate neighbourhood of decaying organic matter. But as to the nature and cause of this decay little was known. In a general and in a not very clear manner it was conceived that dead and decaying organic matter was in some way acted upon by the oxygen in the air, and in a certain sense burnt up or reduced to innocuous substances. During the past twenty years this crude idea is after much study by many of the ablest scientific men of our day given place to a certainty which now rests upon an irrefragable basis. It is now known that the decay of dead organic matter is a very complex process carried on by countless numbers of micro-organisms, which in their turn divide the work to be performed into various stages. In this country, where most of our sewage is waterborne, the process is best illustrated by the functions performed by the liquefying and nitrifying organisms respectively.

This is not the occasion for me to dilate on the detail work which has been performed in this direction, but of which you will have an opportunity of judging when the valuable papers are read at the joint Conference of this and Section III.

At the present moment I am merely referring to the subject for the purpose of drawing attention to what I conceive to be the greatest advance in sanitary science during the past forty years. And the lesson which we learn is that advance can only be made by long and patient observations, such as those which characterise the work of such men as Pasteur, Koch and a host

\* An address by Sir Alexander R. Binnie, M.Inst.C.E., president of the Section of Engineering and Architecture of the Manchester Sanitary Congress.



others. Our object now is not to veil the process of decomposition by the introduction of what were called disinfectants or deodorisers, which too often merely resulted in substituting one unpleasant smell for another, which was more objectionable, but as far as possible to remove from our inhabited areas all decaying organic matter, and as far as possible by proper appliances, not yet completely understood, hasten those processes of nature which lead to the destruction of decaying matter from a harmful to a harmless condition.

While this may be said to be in broad general terms the way along which we are now travelling, yet its application is rendered more difficult than might at first appear, owing to the fact that most of the sewage of our large towns is water-borne sewage, in which the quantity of decaying matter bears but a very small proportion to the total bulk of fluid to be dealt with, as well as to the fact that even the smallest quantity of decomposing matter is sufficient to destroy the purity of exceedingly large volumes of water. And from these latter facts we have gradually learnt the lesson that in a humid climate like that of Great Britain perennial irrigation on a large scale cannot be carried out with that financial advantage which was at one time expected. I do not by this wish to be understood as implying that sewage irrigation may not form a very important function in the purification of our sewage effluents, but rather that such a process is not likely to prove profitable in the long run. Besides the water-borne sewage of our towns there is always a large amount of comparatively dry matter, such as street sweepings, ash-bin refuse, and the like, which does not enter the sewers, and which is an exceedingly expensive matter to dispose of, especially in the large and congested areas of our great towns. Gradually there is growing up for the disposal of these substances a return to one of the oldest known sanitary processes, viz. destruction by fire; and under the improved methods now adopted we are arriving at processes which can be carried on with celerity and without offence, in the immediate neighbourhood from which the substances are derived, and at the same time a certain amount of heat which is evolved in their destruction can be utilised for secondary purposes.

Intimately connected with sewage disposal and the preservation of the public health is an ample and sufficient water-supply, the importance of which has led almost all our large towns to resort to uncontaminated sources of supply far removed from the possibility of pollution.

And there can be no doubt that a pure and uncontaminated water-supply is one of the first necessities of public health. As to whether the water should be soft or hard is largely a matter governed by local circumstances, or in some cases by the requirements; and the experience which we have gained up to the present leads to the conclusion that provided that the water is otherwise pure and unobjectionable, the public health is little or not at all affected, except perhaps in the case of such diseases as calculus and the like.

I was brought up in the belief which I still hold, that a water-supply should be not only pure and uncontaminated, but beyond suspicion of any possible pollution whatever.

However, in recent years I fear that a little laxity, due probably to our improved sewage purification, is creeping in, so that we find large populations supplied with water which has received directly or indirectly many sewage effluents.

From this I draw the conclusion that either our large towns, such as Edinburgh, Glasgow, Manchester, Leeds, Liverpool, Bradford, Birmingham and many others, have uselessly expended millions of money in attaining an ideally pure water-supply, or that the people of London are running a great risk in continuing to depend almost entirely on the waters of the Thames and the Lea, which receive the more or less clarified sewage effluents of over a million and a quarter of persons.

And I am inclined to believe with the late Sir George Buchanan that large populations can continue to drink water which has been contaminated with apparent impunity, but that sooner or later such water takes upon itself morbid qualities which lead to death and disease.

Nearly connected with a pure water-supply is pure air. As to some extent is insured by proper drainage and house ventilation, but it cannot be denied that the air of our large towns is far less pure than could be desired. And this to a large extent is no doubt due to the smoky atmosphere in which our town dwellers reside, and this when combined with mist and fog becomes at times one of the greatest evils from which our urban populations suffer.

As to the prevention of fogs, no doubt a great improvement is effected by proper drainage, but when towns or cities are situated in large river valleys, such as the Thames, and like London, one-tenth of which is situated on areas below high-water level, it is unreasonable to expect that fogs can be abolished.

However, much can be done in the future to alleviate a great deal of the dirt and misery caused by a combination of

fog and smoke, by a proper and more economical application of our fuel for heating purposes.

As at present used the domestic fire in London, which burns coal in an open grate, is largely responsible for the contaminated state of the air; not only so, but it is a most wasteful mode of utilising our fuel.

What really is required is a cheap and economical heating gas; at present, however, our gas manufacture being principally directed to produce a pure gas of high illuminating power, owing to its expense is in most cases a bar to its utilisation for heating purposes.

However, it is not an impossibility to produce a cheap gas of great heating power, but of low illuminating efficiency, which latter can be increased by the use of proper incandescent mantles.

Nor is this an imaginary or ideal conception, for in the present Session of Parliament one of our largest London gas companies has obtained power to purchase 120 acres of land for the purpose, as stated by their chairman, Sir George Livesey, of carrying out a system of gas manufacture such as that I have above described.

With electricity for the internal illumination of our houses, with gas fuel instead of the crude coal for heating and cooking purposes, and a cheap incandescent-gas lamp for street use I feel certain a great improvement could be made in the air breathed by our urban populations.

One of the greatest evils of our modern town life is the crowding together in congested areas of vast masses of the less affluent members of the community, and unfortunately owing to their circumstances they are unable to live in any but the poorest tenements. The difficulties which surround this problem are due in great part to the large rise in the value of land in our great towns, owing to that aggregation of population the evils of which we desire to avoid. But perhaps we may draw a lesson and see how this problem of increased urban land value versus dense population, is working itself out in a class somewhat above the poorest.

The City of London, properly so called, and the districts of Holborn and the Strand, as an example, were formerly thickly inhabited by traders and tradespeople, together with the vast commercial population which follows commercial life. Within the last fifty years, however, so enhanced has become the value of land and houses for purely business and commercial purposes, that the former residents have found it impossible to reside in those districts and more economical to migrate to suburban areas; consequently our census returns show us that the resident population in the City, Holborn and the Strand is rapidly decreasing.

The consideration of these facts at once points to the conclusion that some means of transit must be afforded for the workers, who are employed in our centres of commercial industry during the day, to their places of residence in the suburbs.

Much has already been done by the provision of railways and tramways to meet modern requirements, but I think that the lesson that we have to study in the future in dealing with this question is the dispersal of our redundant population over larger areas, and the removal, as far as practicable, of our manufactories from our towns into the country.

This latter with our improved telegraphic and telephonic communication should not be impossible of achievement, and may even prove an economy to the manufacturer by locating his works in districts where land is cheap, which would allow of the construction on an enlarged area of more healthy dwellings for the labouring population.

The dispersal of our London population in the manner above suggested has been well illustrated during the past few years by the result of the working of the Central London Electric Railway and the Electric Tramways, which extend from its western extremity towards Hounslow, Isleworth and Uxbridge.

An investigation of the low fares at which our working population can travel by this route, together with the fact that the Central London Railway alone is able to pay its shareholders 4 per cent. per annum on their investments, should prove an encouragement to other persons to do likewise. But when we have done our utmost to disperse our population as far as practicable, there will always remain a very large proportion of workers who must from the nature of their occupations reside on or near the site of their labours, and for their accommodation improved dwellings must be provided, and we have in London in the Boundary Street area, opened some years ago by the King and Queen, and in the new buildings being erected at Millbank by the London County Council, examples of what can be done to improve the habitations of our labouring classes.

In the above remarks I have briefly touched upon what have been the great improvements in the past, and on the various topics which to my mind deserve attention in the future. This is not the time to dilate upon the details connected with these various subjects, even were I qualified to grapple with



them; they, however, will be more fully brought before you in the papers which will be read before this and Section III.

To attain, however, the desired ends, I consider that much could be done if all these subjects touching upon municipal life, such as drainage, water supply, gas supply, housing problems and transit, were left more fully in the hands of the governing bodies of our large municipal towns.

These bodies are elected by the public suffrages of the rate-payers; they are representative in the fullest sense of the word, and their members are all of them (and I have had a life-long experience of our municipal bodies), fully competent to deal with these subjects, and could do so, I feel confident, were they relieved from many of the restrictions now placed upon them by our sanitary legislation. Could this be effected not only would a great advance be made in the carrying out of these important sanitary improvements, but the Imperial Parliament would be relieved of a vast amount of work which now presses upon our legislature.

I cannot conceive a greater waste of energy and valuable time, which could be devoted to matters of higher national concern, than to see committees of Parliament and the House of Commons discussing for hours and days matters of purely local interest, of which its members can have in most cases little knowledge and still less interest.

I feel strongly as an old municipal officer that more is to be gained by giving a free hand in all these matters to our local governing bodies and county councils, than in devising new sanitary legislation, which unfortunately appears to hinder rather than expedite the great objects which we all have in view.

In the above remarks it may be said that I have brought before you but the old questions which have been so often discussed. I refrain, however, from troubling you further with a more extended address, as I think that I have suggested some points which are worthy of your consideration, and I feel that if good is to be done in the future it does not flow from addresses such as this, but from the consensus of opinion which the Sanitary Institute has always cultivated, and which is gradually permeating the whole body of the people.

### GENERAL.

**Mr. Silvanus Trevail, F.R.I.B.A., J.P.**, president of the Society of Architects, has been invited to continue in office for the ensuing session, and has consented to be nominated for the second time.

**The Bishop of Reading** has presented a decorative font-cover, designed by Mr. G. F. Bodley, A.R.A., to the cathedral at Oxford, in memory of his late wife.

**M. Paul Albert Besnard** has been elected president of the jury of the exhibition of decorative arts at Turin. Mr. Walter Crane is the honorary president. The other members of the international jury are:—Fierens Gevaert, Charles Gross, Albert Hoffmann, E. de Radisics, E. von Suhr, E. Folcher, Francis Newberry, David Calandra, Alfredo Melani, Jean Tesorone, Joachin, Toesca di Castellazzo.

**The Local Government Board** has requested the Metropolitan Asylums Board to supply information regarding the spread of smallpox by workmen who have been engaged in building hospitals for patients suffering from the disease.

**The Shah of Persia** has received in Paris M. Gervex, the painter, who brought him the portrait for which he sat two years ago, and the artist was invested with the Order of the Lion and Sun.

**The Petersfield Rural District Council** resolved at their last meeting to grant the road surveyor (Mr. L. Waters) 2½ per cent. on the amount (about 1,000*l.*) recovered from the War Office in respect of excessive military traffic over the district roads; in consideration of his extra work in preparing estimates, &c.

**The Belgian Government** has practically decided to construct an electric railway between Brussels and Antwerp. This will be the first long-distance rapid electric service in Europe. The contract will call for a speed of about a mile a minute. The route is twenty-six miles long, and the trains will do the distance in twenty-five minutes.

**The Queen** has graciously consented to continue her honorary membership in the Royal Anglo-Australian Society of Artists, which, as Princess of Wales, she did the Society the honour to accept in 1895.

**Mr. E. P. Hannaford**, who was for several years chief engineer of the Grand Trunk Railway, died suddenly at Montreal on August 18. He was born in Devonshire in 1834, and was employed up to 1855 on the South Devon Railway.

**The Firms of Dorman, Long & Co., Ltd.** and Bell Brothers, Ltd., have amalgamated. Sir Lowthian Bell will become chairman of Dorman, Long & Co., and three of the directors of Bell Brothers are to join the board, Mr. Dorman taking the position of vice-chairman and managing director. The capital of Dorman, Long & Co., when this operation is

completed, will be 1,050,000*l.* The two firms concerned are the largest iron and steel manufacturers of the north.

**The Prussian Forests** have since 1900 yielded in volume 861,000,000 cubic feet, in addition to 2,709,000 cubic feet of oak-tanning bark, 3,408,000 cubic feet of osiers, and 1,809,000 cubic feet of other wood, a total of nearly 869,000,000 cubic feet. The 86,151,083 acres of land in Prussia, 20,435,499, or 23·7 per cent., are occupied by forests and orchards.

**The Duke of Bedford** has offered to the Amptill Rural Council a site of 17 acres and a donation of 500*l.* towards the cost of a permanent isolation hospital for the use of the district, which includes the whole of the Duke's Woburn Abbey estate. The Council had been deterred by the expense from carrying out this long-desired project.

**The Improvements** to the parish church of Whippingham, Isle of Wight, which are to be carried out at the expense of the Royal Family as a memorial to Queen Victoria, have now been commenced. The sanctuary is to be enlarged, and the reredos to be erected will represent the Last Supper, the figures being in a panel of alabaster. A portion of the chancel roof over the sanctuary is to undergo alteration, and the chancel floor part laid with marble. The memorial of the parishioners of Whippingham is to consist of an oak pulpit and a reading desk.

**The Remains** of Roman smelting-works have been discovered during the drainage operations at Stamford. A large number of coins, including gold angels, have been discovered near the site.

**The Manchester Dock and Warehouse Extension Company** are about to expend half a million sterling on dock sheds, electric cranes, &c., in connection with the Ship Canal.

**The Greek Government** have decided to restore the "Lion of Chæroneia," the monument erected in honour of the heroes who fell in the battle of Athens and Thebes against Philip. The monument erected by the Athenian Treasury, the parts of which have been found in the excavations made by the French School at Athens, will also be restored. Delphi under the care of M. Homolle, director of the school at Athens.

**Mr. Albert E. Barton**, of the surveyor's department of the county borough of West Bromwich, has been appointed surveyor and waterworks manager to the East Cowes Council.

**The Metropolitan Asylums Board** have received the official approval for the plans of the additional staff accommodation at Caterham Asylum, to be erected at a cost not exceeding 3,790*l.* The Board have accepted the revised tender of Messrs Entwistle & Gass, of Atlas Works, Bolton, for the supply and fixing of laundry machinery and plant at the Joyce Green Hospital at the sum of 7,682*l.* 2*s.*, in accordance with plans and specifications prepared by the engineer to the Board.

**The Oldham Art Gallery** has been increased by five works bought from the spring exhibition. Three of these are from the brush of the late Mr. William Stott, of Oldham, while the other two are by Mr. S. Melton Fisher and Mr. Arthur Tucker.

**The Countess of Milltown** has made over by deed to the National Gallery in Dublin all the pictures, plate, furniture and other objects of value in her eighteenth-century residence at Russborough, Blessington (county Wicklow), and directs them to be kept in separate rooms and marked as the Milltown Museum.

**M. Hanotaux**, the French ex-minister, has presided over a congress on hydraulic-power which took place at Grenoble. A State monopoly or regulation of water-power was among the subjects discussed.

**Mr. Arthur S. Cope, A.R.A.**, has been commissioned to paint the portrait of the Earl of Northbrook, which is to be hung in the county buildings at Winchester as a public memorial of his services to the country and to the county of Hampshire, of which he has been for many years Lord Lieutenant.

**In the Cape House of Assembly** on Friday last, Sir Gordon Spriggs moved the second reading of the Harbour Board Loan Bill, providing for a loan of 2,795,400*l.* for improving the harbours of Table Bay, Port Elizabeth, East London and Mossel Bay. The Premier urged that greater facilities would be required at the ports to meet the anticipated expansion of trade. Mr. Merriman expressed his willingness to support the Bill as it would be referred to committee.

**The Congress of the British Archæological Association** will begin on Monday next with a meeting in the Westminster town hall. During the week there will be visits to Rochester, Cobham, Godalming, Guildford, Colchester, Westminster, Harrow, &c.

**The Work** of widening London Bridge, for which Messrs Pethick & Co., of Plymouth, are the contractors, is being rapidly pushed forward. Large steel structures have already been erected on either side of the bridge to carry the extended footways.











1902.



"INK-PHOTO" SPRAGUE & CO. LTD. 4 & 5, EAST HARDING STREET, FETTER LANE, E.C.

CORNWALL.

itect.







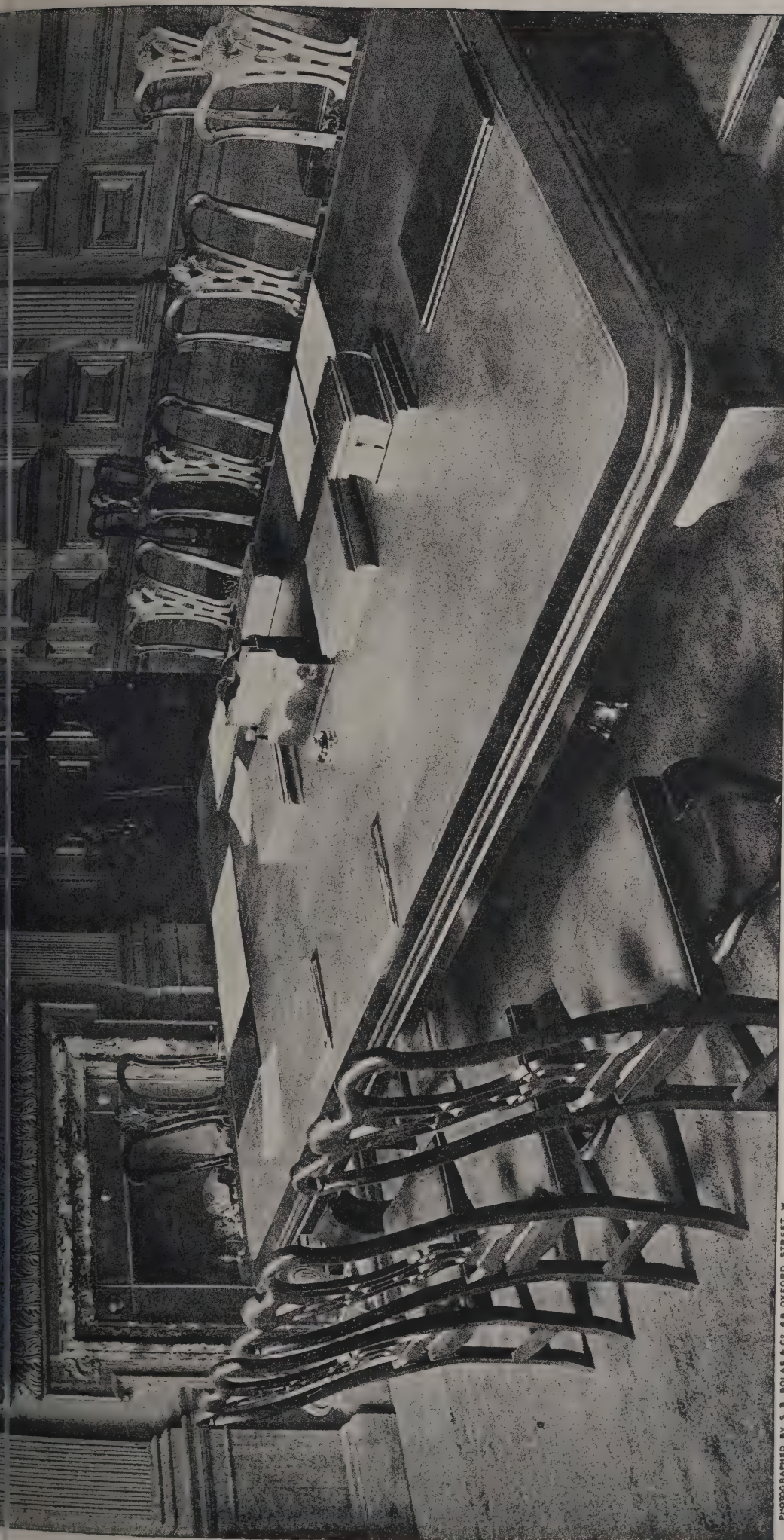




The Architect, Sep<sup>r</sup> 12<sup>th</sup> 1902.







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# CLASSIFICATION ROOM: LLOYD'S BUILDING, FENCHURCH STREET, E.C.

T. E. COLLCUTT, F.R.I.B.A., Architect.



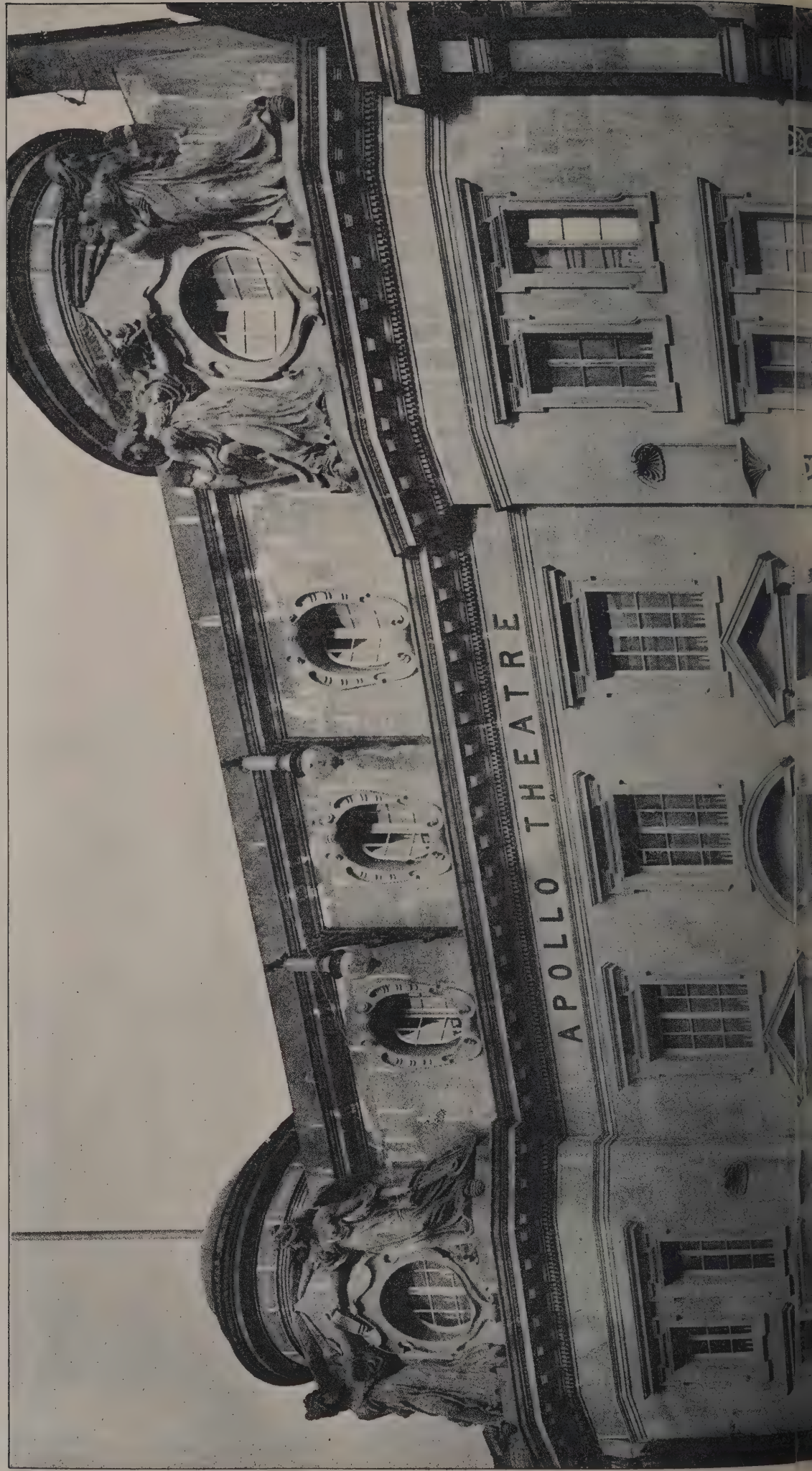




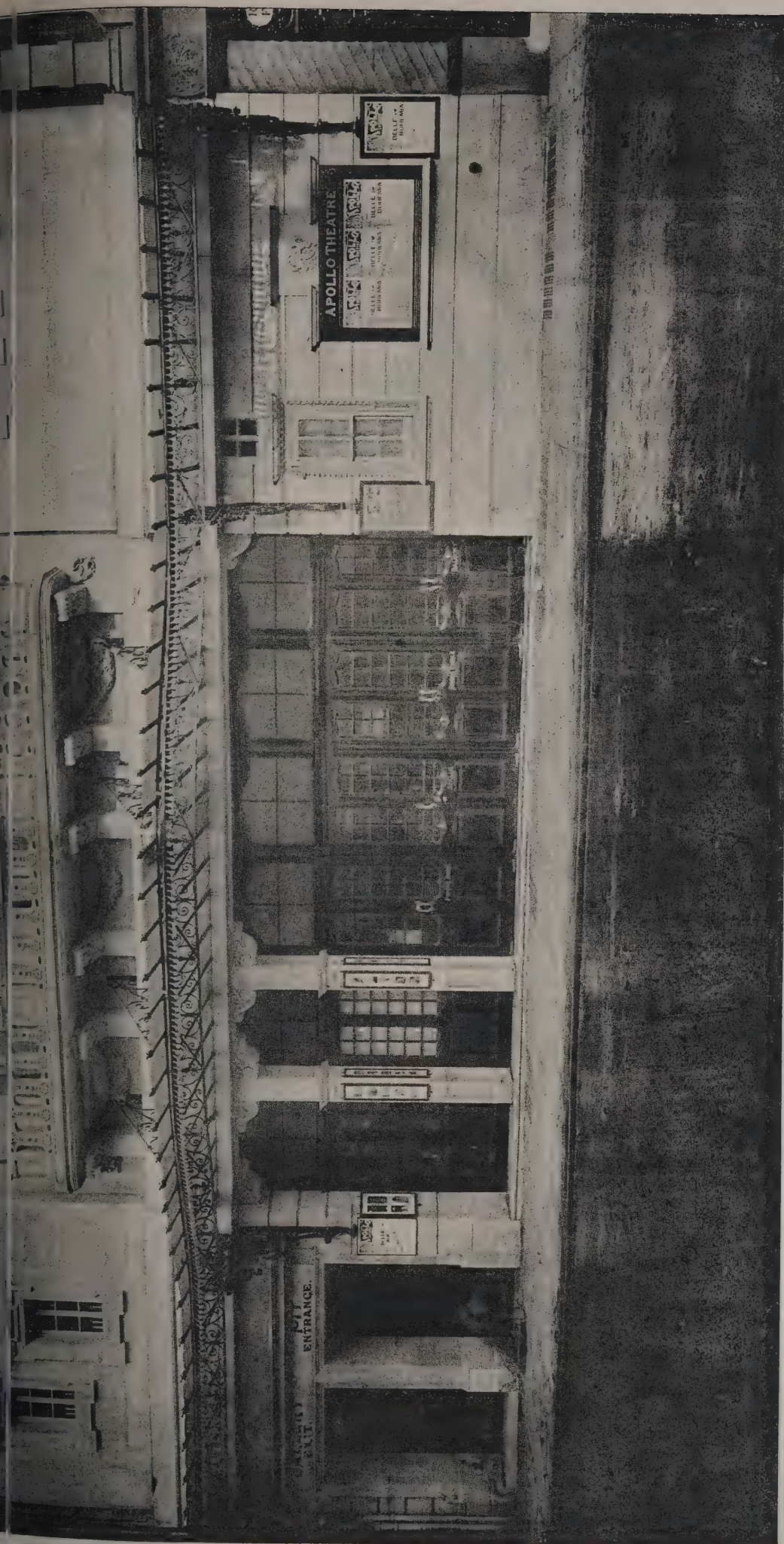




The Architect, Sept. 12<sup>th</sup> 1902.







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## APOLLO THEATRE, SHAFTESBURY AVENUE, W.

LEWIN SHARP, Architect.









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BY J. B. CIPRIANI RA



# THE Architect and Contract Reporter.

## EDITORIAL NOTICES.

view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.

Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.

authors of signed articles and papers read in public must necessarily be held responsible for their contents.

communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.

respondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.

## TENDERS, ETC.

As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.

## COMPETITIONS OPEN.

BERMONDSEY.—Sept. 16.—Designs are invited for artisans' dwellings to be erected on land at Rotherhithe, within the parish of Bermondsey, and known as the Fulford Street area. Premiums of 100*l.*, 60*l.* and 40*l.* will be awarded. Mr. Fredk. town clerk, Town Hall, Spa Road, S.E.

BIDEFORD.—Sept. 25.—The Town Council of Bideford are to erect municipal offices and a public library upon a site opposite the west end of the Long Bridge, Bideford, and invite designs for the proposed buildings. Premiums of 50*l.* and 10*l.* respectively are offered for the designs which may be placed by the Council first, second and third in order of merit. Designs and descriptions, &c., are to be delivered to Mr. Wm. B. Seldon, town clerk, 18 The Quay, Bideford.

CAPE TOWN.—Jan. 31.—The Council of the University of Cape of Good Hope invite designs for the erection of university buildings. Premiums of 400*l.*, 200*l.* and 100*l.* will be awarded to the authors of the designs placed first, second and third respectively. Particulars of the competition may be obtained on application to the Registrar at Cape Town, or to the Agent-General in London.

GREENWICH.—Oct. 9.—Designs are invited for a public library (with chambers for chief librarian's residence) to be erected at a cost of about 6,500*l.*, with fittings, on a site about 7,000 feet super, in the borough of Greenwich. Premiums of 50*l.* and 30*l.* are offered. Particulars can be obtained on application to the Greenwich Borough Council.

INDIA.—Nov. 1.—Competitive designs are invited for the erection of a memorial to Her Majesty the late Queen Victoria at Allahabad. A premium of 2,000 rupees will be awarded to the design selected by the committee. Mr. H. Nelson Wright, Indian Civil Service, honorary secretary, Queen Victoria Memorial Fund Committee, Allahabad, India.

LIVERPOOL.—Sept. 15.—Designs are invited for new labourers' dwellings to accommodate about 2,500 persons, to be erected on the Hornby Street area. Premiums of 250*l.*, 150*l.* and 100*l.* respectively are offered for the first three selected designs. Particulars will be supplied by the Town Clerk.

MAIDENHEAD.—Oct. 1.—Designs for free library. Premiums offered of 50*l.*, 20*l.* and 10*l.* respectively. Mr. John Kirk, town clerk, Guildhall, Maidenhead.

NEWARK.—Oct. 14.—Designs and suggestions are invited for alterations and additions at the infirmary, Bowbridge Road, Newark, comprising a board and committee-room, a new mortuary and provision for twenty extra beds. A prize of twenty guineas is offered for the best plans sent to the office of Mr. M. H. Colton, clerk, 27 Lombard Street, Newark.

STROOD.—Oct. 15.—Plans are invited for further hospital accommodation on a site recently acquired by the Strood Rural District Council in Whitehill Road, Cobham. A premium of 15*l.* 15*s.* is offered for the best set of plans submitted.

## CONTRACTS OPEN.

ALDERSHOT.—For erection of new schools, Newport Road, Aldershot. Messrs. Fowler & Hugman, surveyors, 9 Craig's Court, Charing Cross, S.W.

BIRKENSHAW.—Sept. 22.—For erection of a pair of semi-detached villas at Birkenshaw, Yorks. Messrs. Walker & Collinson, architects, Swan Arcade, Bradford.

BIRMINGHAM.—Sept. 22.—For alterations and additions to a house in Oak Tree Lane, Selly Oak. Mr. Edwin Docker, clerk to the Guardians, 10 Newhall Street, Birmingham.

BRISTOL.—Sept. 25.—For repairs, cleaning and painting the schools, almshouses and city properties, including the keeping in repair of roofs of same for a period of five or seven years, for the Trustees of the Bristol Municipal Charities. Messrs. Foster & Wood, surveyors, 35 Park Street, Bristol.

BURTON SALMON.—Sept. 24.—For erection of station buildings, warehouse and station-master's house at Burton Salmon, for the North-Eastern Railway Company. Mr. William Bell, the company's architect.

CHELMSFORD.—Sept. 25.—For erection of laboratories for the technical instruction committee of the Essex County Council. Mr. Frank Whitmore, architect, Duke Street, Chelmsford.

COWFOLD.—Sept. 16.—For alterations and additions to East Ridge, Cowfold, Sussex. Mr. William Buck, architect, Horsham.

DERBY.—For extensions to the Vulcan Ironworks, Derby. Mr. Ernest R. Ridgway, architect, Long Eaton, Notts.

DERBY.—Sept. 29.—For erection of a school on the Norton Road. Mr. A. Macpherson, architect, Tenant Street, Derby.

DEVONPORT.—Sept. 18.—For erection of buildings at the gasworks. Mr. A. B. Pilling, town clerk, Devonport.

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ELLAND.—Sept. 20.—For erection of a house, &c., at Spring Gardens, Elland. Mr. Raymond Berry, architect, Commercial Street, Halifax.

HALIFAX.—Sept. 15.—For pointing the masonry of the water tower at Royles Head reservoir and the reservoir wall and archway at Hanson Lane, and for painting the cast-iron tank, beams and spiral staircase at Royles Head reservoir, and the outside wood and ironwork of Woodside baths, Haley Hill. Mr. Keighley Walton, town clerk, Town Hall, Halifax.

HAMMERSMITH.—Sept. 23.—For erection of board-room, clerk's offices, receiving home for children and out-relief offices. Mr. J. H. Richardson, architect, 87 Finsbury Pavement, E.C.

HAMMERSMITH.—Sept. 24.—For erection of a block of workmen's dwellings in Yeldham Road. Mr. H. Thompson, town clerk, Town Hall, Broadway, Hammersmith.

HANWELL.—Sept. 15.—For construction of an above-ground convenience (containing two w.c.'s) in the cemetery at Hanwell. Mr. Wm. Chambers Leete, town clerk, Town Hall, Kensington, W.

HENDON.—Sept. 15.—For erection of a pair of cottages at the sewage outfall works, Renters Lane; the erection of a corrugated iron fire-escape shed, Institute Road; and the supply and erection of entrance gates, boundary fencing, &c., at the Council offices. Mr. Henry Humphris, clerk, Urban District Council offices, The Burroughs, Hendon, N.W.

HORNSEY.—Sept. 22.—For taking-down fencing, &c., in Tottenham Lane, and erecting a new dwarf wall, with iron fencing, gates, &c. Mr. E. J. Lovegrove, engineer, Southwood Lane, Highgate, N.

ILKESTON.—Sept. 16.—For erection of a laundry, with additions and alterations to the administrative department, at the Ilkeston hospital, Heanor Road, Ilkeston. Mr. Charles W. Hunt, architect, 132 Station Road, Ilkeston.

IRELAND.—Sept. 23.—For erection of an underground transformer sub-station building in Sackville Street, Dublin, in connection with the municipal electricity works. Mr. Spencer Harty, city engineer, City Hall, Dublin.

KINGSTON-UPON-HULL.—Sept. 24.—For erection of two steel girder railway bridges over Hedon Road, Kingston-upon-Hull—one about 70 feet long and carrying four lines of railway, and the other 65 feet long and carrying two lines of railway—for the North-Eastern Railway Company. Mr. T. M. Newell, engineer, Dock Office, Hull.

LAMBETH.—Sept. 17.—For erection of bathroom for females and extension of female clothing stores at Revere Road workhouse. Mr. S. R. J. Smith, architect, 15 York Buildings, Adelphi, W.C.

LEEDS.—For plumbing, plastering and painting works on two houses at Roundhay. Mr. A. Geldard, builder, Shepherd's Lane, off Roundhay Road, Leeds.

LEYLAND.—Sept. 16.—For erection of business premises on Chapel Brow, Leyland. The Leyland and Farington Co-operative Society, Ltd, Golden Hill, Leyland.

LONDON.—Sept. 18.—For construction of a new operating-room at the infirmary, East Dulwich Grove, S.E. Mr. D. Stevenson, architect, 13 and 14 King Street, Cheapside, E.C.

LONDON.—Sept. 24.—For supplying and fixing new hot-water heating apparatus, &c., to six pavilions, at the Park hospital, Lewisham, S.E. Mr. T. Duncombe Mann, clerk, Metropolitan Asylums Board, Embankment, E.C.

LONDON.—Oct. 7.—For erection of a new cartshed, livery, &c., at Sydenham Wells Park, S.E. Particulars at the General Section (Architect's Department), L.C.C., 18 Pall Mall East, S.W.

LONDON.—Oct. 7.—For erection of a refuse destructor. Mr. D. J. Ebbetts, surveyor, 242 High Street, Acton, W.

LOSTOCK HALL.—Sept. 24.—For removal of excavation and erection of new carriage shed at Lostock Hall, near Preston, for the Lancashire and Yorkshire Railway Co. Mr. R. C. Irwin, secretary, Hunt's Bank, Manchester.

LOWESTOFT.—Oct. 7.—For construction of a timber pier at Lowestoft. Mr. John F. Stovell, secretary to the Eastern Development Company, Ltd., 33 Walbrook, E.C.

MANCHESTER.—Sept. 15.—For construction of a covert and appurtenant works for the diversion of the Sharncliffe Brook. The Secretary, Rivers Department, Town Hall, Manchester.

MANCHESTER.—Sept. 15.—For supply and delivery of valves and steelwork for bridge. The Secretary, Rivers Department, Town Hall, Manchester.

MIDDLESBROUGH.—Sept. 24.—For removal of the existing Dent's wharf on the river Tees at Middlesbrough and the construction of a new pitch-pine timber wharf about 2½ feet long and 30½ feet in width, for the North-Eastern Railway Company. Mr. T. M. Newell, engineer, Dock Office, Hull.

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**MIDDLESBROUGH.**—Sept. 27.—For erection of police station, &c., at South Bank, near Middlesbrough. Mr. Walter Tierley, county architect, 13 Lendal, York.

**MIDDLETON JUNCTION.**—Sept. 24.—For construction of retaining walls, &c., for the widening of the line at Middleton Junction, Lancashire and Yorkshire Railway Company. Mr. R. C. Irwin, secretary, Hunt's Bank, Manchester.

**NORWICH.**—Sept. 16.—For erection of addition class-rooms and alterations at the Thorpe Hamlet girls' school and a Street boys and girls' schools. Mr. C. J. Brown, architect, Cathedral Offices, Norwich.

**RICHMOND.**—Oct. 2.—For erection of a dining-hall and other buildings at the workhouse Richmond. Mr. Edward Bridge, architect, Bank Chambers, Richmond, Surrey.

**RIPON.**—Sept. 17.—For erection of the Victoria Nurses' Home. Mr. Thomas Stokes, architect, Thirsk.

**RUDDINGTON.**—For erection of villa residence, Ruddington. Messrs. Sands & Walker, architects, Angel Nottingham.

**RUDDINGTON.**—For erection of a lace factory and power-loom and chimney at Ruddington, Nottingham. Mr. Ernest Ridgway, architect, Long Eaton, near Nottingham.

**SCOTLAND.**—For erection of an hotel at Dornoch. Messrs. Brown & Burnett, architects, Academy Buildings, Inverness.

**SCOTLAND.**—Sept. 15.—For alterations at stable yard, Dalck Road, Glasgow. Mr. J. Lindsay, town clerk, City Chambers, Glasgow.

**SCOTLAND.**—Sept. 22.—For erection of an elementary school to accommodate 400 pupils, offices, parapet walls, &c., corner of Sang Road and Gow Crescent, Kirkcaldy. Mr. William Williamson, architect, 220 High Street, Kirkcaldy.

**SCOTLAND.**—Sept. 20.—For erection of houses for the working classes at the corner of Victoria Street and Charles Street, Perth. Mr. R. M'Killip, burgh surveyor, 12 Tay Street, Perth.

**SOUTHBOROUGH.**—Sept. 22.—For erection of schools to accommodate 452 children in Powder Mill Lane, High Brooms, Southborough, Kent. Mr. C. H. Strange, architect, 20 Dudley Street, Tunbridge Wells.

**SOUTHWARK.**—Sept. 18.—For converting a railway arch at Union Street, S.E., into stables, &c. Mr. G. D. Brown, architect, 13 and 14 King Street, E.C.

**STAPLEFORD.**—For erection of stabling and loose-boxes, &c., at Stapleford. Mr. Ernest R. Ridgway, architect, Long Eaton, near Nottingham.

**STOKE-UPON-TRENT.**—Sept. 24.—For conversion of one of the cottage homes at Penkhill into ordinary sick wards for children. Mr. C. Lynam, architect, Stoke-on-Trent.

**SUTTON.**—Sept. 24.—For erection of a laundry at the Banstead Road school, Sutton, Surrey. Messrs. Newman & Newman, architects, 31 Tooley Street, London Bridge, S.E.

**SWADLINCOTE.**—Sept. 19.—For the following works for the Urban District Council (gas department):—(Contract No. 1) two-storeyed building, to combine engine and boiler-house, stores and workshops; (2) wrought-iron roof for above, 26 feet 9 inches span by 45 feet 5 inches long; (3) two steel boilers, 5 feet 6 inches diameter, 15 feet long, 75 lbs. steam pressure; (4) one rotary exhaustor and engine combined, to pass 25,000 per hour, with valves, governors and connections for a second; (5) two 12-inch governors, with by-pass, valves and connections; (6) station meter, to pass 25,000 cubic feet per hour, with by-pass, valves and connections. Mr. W. A. Musson, town clerk, Swadlincote, Burton-on-Trent.

**THORNABY-ON-TEES.**—Sept. 27.—For erection of a new police station, &c., at Thornaby-on-Tees. Mr. Walter H. Brierley, county architect, 13 Lendal, York.

**WALES.**—Sept. 15.—For erection of a new school, consisting of mixed and infants' departments, at Llwyncelyn, Porth. Mr. Jacob Rees, architect, Hillside Cottage, Pentre.

**WALES.**—Sept. 16.—For erection of a school to accommodate 400 infants at Trallwn, Pontypridd. Mr. D. Milton Jones, clerk, School Board Offices, Pontypridd.

**WALES.**—Sept. 18.—For erection of a showroom, dwelling-house, &c., on the New Road, Dowlais. Mr. T. Roderick, architect, Glebeland, Merthyr.

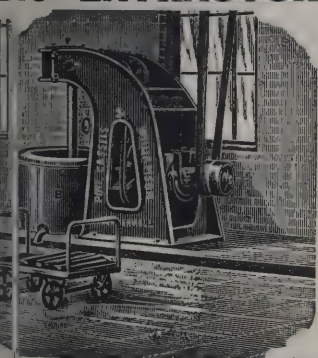
**WALES.**—Sept. 19.—For erection of twenty cottages at Pontllanfraith. Mr. W. Phillips, Pantycelyn, Pontllanfraith.

**WALES.**—Sept. 20.—For erection of four better class houses at Tal-y-llyn, near Brecon. Mr. Hy. Waters, architect, Beaufort.

**WALES.**—Sept. 25.—For erection of a mixed school to accommodate 160 children and teacher's house at Brynna, Llanharran. Mr. L. Vaughan Evans, Court House, Pencoed.

**WALLSEND.**—Sept. 27.—For extension of the Carville junior school and caretaker's house, Wallsend. Clerk of the Board, Bewicke Schools, Willington Quay, R.S.O.

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**WESHAM.**—Sept. 30.—For erection of workhouse and offices at Wesham, Lancs. Messrs. Haywood & Harrison, architects, Accrington.

**WHITECHAPEL.**—Sept. 22.—For erection of stores, cart and van sheds, lodge and public urinals at the depot in Wentworth Street. Mr. G. W. Clarke, town clerk, 15 Great Alie Street, Whitechapel, E.

**WIGAN.**—Sept. 24.—For erection of an engine shed, &c., and widening of bridge at Wigan, for the Lancashire and Yorkshire Railway Company. Mr. R. C. Irwin, secretary, Hunt's Bank, Manchester.

**WOOLWICH.**—Sept. 18.—For erection of municipal buildings at the corner of Wellington Street and Upper Market Street, Woolwich. Mr. A. Brumwell Thomas, architect, 5 Queen Anne's Gate, Westminster.

**WOOLWICH.**—Sept. 18.—For erection of a greenhouse at the new portion of Woolwich cemetery. Mr. Arthur B. Bryceson, town clerk, Town Hall, Woolwich.

**WORKINGTON.**—Sept. 15.—For erection of thirty-six cottages in Lowe Lane, Workington. Messrs. W. G. Scott & Co., architects, Victoria Buildings, Workington.

### WHITWORTH SCHOLARSHIPS AND EXHIBITIONS, 1902.

SCHOLARSHIPS of 125*l.*, tenable for three years, have been awarded to the following engineering students:—William M. Selvey, London; Leonard Bairstow, Halifax; Isaac V. Robinson, West Hartlepool; Arthur Baker, Gosport, Hants. Exhibitions of 50*l.*, tenable for one year, have been gained by Charles Cook, John S. Mitchell, Charles J. Stewart, Arnold H. Gibson, William E. W. Millington, Neil J. Maclean, Henry J. Jones, Harold Rawstron, George H. Childs, Norman L. Ablett, William E. F. Curror, Walter L. Port, John Alexander, Louis D. Stansfeld, Robert J. A. Pearson, William L. Perry, Arthur S. Angwin, Francis G. Steed, Henry A. Bagg, Frederick J. Crabbe, Arthur Garrard, Benjamin J. Thomas, Maurice B. Dalby, Thomas Wadhams, Oliver S. Spokes, James Crone, Alexander B. Sowter, Fred. Sykes, Frederick E. Rebbeck, Frank W. Harris.

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Accepted tenders.

Shackleton & Co., Clayton Heights, Bradford, mason.  
 Iford and District Joiners' Works Department, Adolphus Street, Bradford, joiner.

W. & H. Pickles, Shipley, plumber.

& W. Bates, 827 Manchester Road, Bradford, plasterer.

Hill & Nelson, Bradford, slater.

Roberts & Co., Dudley Hill, ironfounder.

Erection of an engine-house, &c., at Northside Mills, Legrams Lane. Mr. JAS. LEDINGHAM, architect, District Bank Chambers, Bradford.

Accepted tenders.

McKesson Bros., Garfield Avenue, Manningham, mason and joiner.

G. Jackson, Gaythorne Road, Bradford, plumber.

J. Smithies, 356 Great Horton Road, Bradford, slater.

Thorp, Stephenson Fold, Southfield Lane, Great Horton, plasterer.

Holbrook & Son, Broughton Terrace, Bradford painter.

BRISTOL.

Erection of a cemetery chapel at Canford Lane, Westbury-on-Trym. Messrs. LA TROBE & WESTON, architects, 20 Clare Street, Bristol.

W. Harris	£1,625	11	5
Flower	1,456	0	0
Eastbrook & Son	1,439	0	0
E. Longden	1,390	0	0
R. Sowett	1,357	0	0
A. Chase	1,336	10	0
E. B. James	1,308	15	0
Perkins	1,265	0	0
& J. Bennett	1,250	0	0
Whitely	1,242	9	6
Love	1,170	0	0
Walters	1,150	0	0
CLARK, Fishponds (accepted)	1,099	0	0

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For erection and completion of certain proposed additions to the motor-room and offices, Bread Street, to adapt them for the extension of the plant for generating electricity for tramway purposes. Mr. F. J. C. MAY, surveyor.

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For street works in Smawthorne Lane, Castleford, Yorks. Mr. WM. GREEN, surveyor.

W. WADDINGTON, Charles Street (accepted) £803 0 0

For repair of the market hall roof, Castleford, Yorks. Mr. W. GREEN, surveyor.

M. H. PENNINGTON, Bridge Street (accepted) £108 0 0

For sewerageworks in Duke Street, Castleford, Yorks. Mr. W. GREEN, surveyor.

J. L. RODGER & SON, Albion Street (accepted) £130 0 0

CATERHAM VALLEY.

For alterations and fitting-up shop. Messrs. WILLIAM EVE & SONS, architects, 10 Union Court, Old Broad Street.

Rendel £670 10 0

Newberry 650 0 0

Thompson 620 0 0

Cadman 619 0 0

Vaughan 570 0 0

Haslemere Builders, Ltd. 550 0 0

Vigor 527 16 0

Lascelles 495 0 0

WATTS, JOHNSON & CO., Burdett Wharf, Thomas Street, Limehouse, E. (accepted) 477 0 0

COCKERMOUTH.

For supplying 9-inch, 6-inch and 4-inch sewer pipes.

MOSS SIDE SAND & BRICK WORKS, Skelmersdale, near Ormskirk (accepted).

DENTON.

For street and sewerage works in Osborne Road, Denton, Lancs. Mr. GEO. H. NEWTON, surveyor.

I. POWELL, Ivy Cottage, Cocker Hill, Stalybridge (accepted).

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**DONCASTER.**

For supply of an ejector condenser plant, with necessary pumps, piping, &c, at the electricity works. Mr. W. WYLD, borough electrical engineer.

T. Ledward & Co.	£1,213	0	0
Korting Bros.	1,095	5	0
Klein Engineering Company	1,075	0	0
GEIPEL & LANGE, Parliament Mansions, Westminster, S.W. (accepted)	1,069	10	9
R. Morton & Sons	1,051	0	0

**DUKINFIELD.**

For sewerage works in Crescent Road, Old Road, Ashton Street and Bridge Eye district. Mr. SAMUEL HAGUE, borough surveyor.

*Crescent Road and Old Road.*

L. Beddows & Co.	£1,868	9	0
G. Wilde	1,296	16	0
Etheridge & Clark	1,083	11	0
W. Underwood & Brother	1,061	3	0
W. H. WORTHINGTON, Manchester (accepted)	944	13	0

*Ashton Street district.*

L. Beddows & Co.	1,084	13	6
W. H. Worthington	567	14	3
G. Wilde	557	12	0
Etheridge & Clark	543	13	0
Pryke & Hayward	535	19	6
W. UNDERWOOD & BROTHER (accepted)	493	1	0

*King Street and Wharf Street.*

L. Beddows & Co.	1,082	9	0
W. H. Worthington	380	18	0
G. Wilde	290	3	3
Pryke & Hayward	288	11	8
Etheridge & Clark	216	0	3
W. UNDERWOOD & BROTHER (accepted)	195	2	0

*Bridge Eye district.*

L. Beddows & Co.	483	10	0
W. H. Worthington	299	4	6
Pryke & Hayward	296	19	1
Etheridge & Clark	281	9	6
G. Wilde	272	7	0
W. UNDERWOOD & BROTHER (accepted)	252	2	6

**GATESHEAD.**

For erection of a dwarf boundary wall at Saltwell center. Mr. J. BOWEN, borough surveyor.  
STEPHENSON, Low Fell, Gateshead, £2 15s. per 8 feet without coping (accepted).

**GRAYS.**

For raising the top-floor ceilings and cleaning and painting other works at the *Exmouth* training ship infirmary. Therfield House, Grays, Essex. The Surveyor Metropolitan Asylums Board is the architect. No quantities supplied.

H. C. Horswill	£274	0	0
H. R. Rons	255	0	0
Mark Batchelor	188	0	0
Enness Bros.	182	0	0
J. J. Richards	160	0	0
W. A. PHILBEY, 94 High Street, Grays (accepted)	137	0	0

**HALWELL.**

For repairing and levelling existing road and constructing new carriage drive, two entrances, piers and gas Higher Washbourne, Halwell, near Totnes. M. MONTAGUE LUKE, engineer, 15 Princess Square Plymouth.

Shillabear	£650	0	0
Harris & Leigh	241	5	0
Harris & Leigh	226	5	0
W. E. BENNETT, 44 South View Terrace, Plymouth (accepted)	202	3	0

**HULL.**

For exterior painting at the workhouse, Beverley Road. M. T. BEECROFT ATKINSON, architect, 11 Trinity Lane, Hull.

Hull Painting and Decorating Co.	£195	0	0
W. C. Drewery	170	0	0
J. Dickson	169	0	0
J. R. Green	150	6	0
Crawford & Credland	150	0	0
Adams & Usher	149	5	0
Lightowler & Son	144	2	0
Stephenson & Christopher	142	0	0
F. Fellows	120	0	0
C. S. DRURY & SONS, Caroline Street, Hull (accepted)	120	0	0

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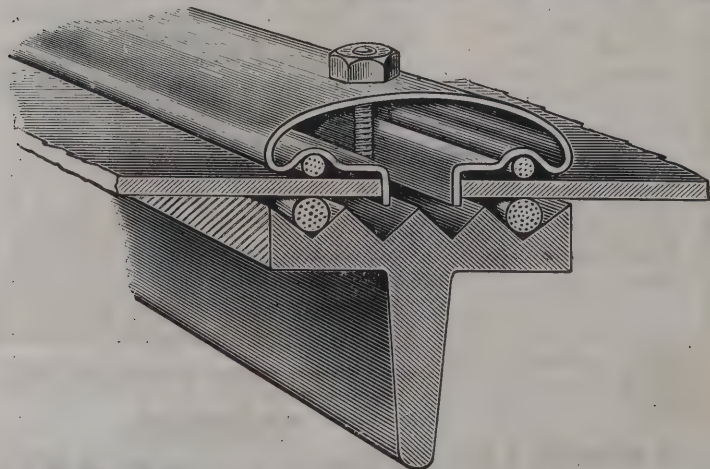
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GOSFORTH.

For street works in Gosforth. Mr. C. J. BAFF, surveyor.  
Contract No. 1.—Purcell Street South, Purcell Street North  
Dunn Street, Chapel Street, South Street, West Street,  
Lambert Square (part of), Wall Street, Mary Agnes Street,  
John Street, Coronation Street and back streets, &c.

Wardlow	£3,494	0	4
Thompson	3,092	1	9
Appleby	3,072	17	6
Edgar Bros.	3,052	4	4
Robson	2,971	18	7
Hollings	2,919	17	11
J. McLaren	2,856	15	6
T. & R. McLaren	2,796	13	6

SIMPSON, Ellison Terrace, Newcastle-on-Tyne  
(accepted) 2,378 6 8

Contract No. 2.—Ashburton Road (part of), Ashfield Road,  
Wolsingham Road, North Avenue (part of), Broomfield  
Road, Mayfield Road, Woodbine Road (part of), Woodbine  
Avenue (part of), West Avenue (part of), Hawthorn Road  
(part of), Gordon Avenue (part of), Causey Street (part of)  
and back streets, &c.

Wardlow	£3,923	14	10
J. McLaren	3,417	1	7
Thompson	3,397	18	5
Edgar Bros.	3,379	8	6
T. & R. McLaren	3,322	7	7
Appleby	3,319	10	0
Robson	3,092	11	10
SIMPSON (accepted)	3,072	1	2
Hollings	2,337	15	9

Contract No. 3.—Spittal Terrace (part of), Rothwell Road (part  
of), Alwinton Terrace (part of), Bath Terrace (part of),  
Harley Terrace (part of), Woolley Terrace (part of),  
Beaumont Terrace (part of), Hyde Terrace (part of) and  
back streets, &c.

Wardlow	£2,130	9	8
Edgar Bros.	1,980	17	3
Appleby	1,913	19	0
T. & R. McLaren	1,874	4	9
Robson	1,847	16	0
Thompson	1,825	15	9
J. McLaren	1,823	18	4
Hollings	1,778	9	6
SIMPSON (accepted)	1,769	7	1

GOSFORTH—continued.

Contract No. 4.—Rectory Road (part of), Stoneyhurst Road  
(part of), Balmoral Terrace (part of), Windsor Terrace  
(part of), Sandringham Road (part of), Audley Road (part  
of), William Street and back streets, &c.

Wardlow	£2,385	10	11
Edgar Bros.	2,051	11	10
T. & R. McLaren	2,041	18	3
Hollings	2,030	1	0
Appleby	1,972	0	4
Simpson	1,969	6	7
Thompson	1,930	5	4
J. McLaren	1,859	15	6
ROBSON, Fern Avenue, Newcastle-on-Tyne (accepted)	1,849	8	7

HARBERTON.

For repainting and decoration of the Harberton parish church,  
near Totnes. Mr. SILVANUS TREVAIL, architect, Truro.

R. Bruce	£149	0	0
J. T. FOURACRE & SON, Stonehouse, Plymouth (accepted)	145	0	0
Architect's estimate	150	0	0

IRELAND.

For carrying-out sewerage scheme at Clones.

J. Donnelly	£402	15	5
W. MCQUADE, Drumadrainey, Stonebridge, Clones (accepted)	371	14	6

For drainage of the cemetery, the construction of a drain from  
cemetery to town sewer and erection of a stone dyke and  
fence on the west side of roadway to cemetery, Carrick-  
fergus. Mr. W. D. R. TAGGART, engineer, 71A Donegall  
Street, Belfast.

Cemetery.

Grainger Bros.	£585	8	2
F. Gardner	284	0	0
R. Ewing	283	13	0
W. AGNEW, Whitewell (accepted)	190	13	0

Approach.

R. Ewing	399	10	2
Grainger Bros.	306	19	0
F. Gardner	274	7	0
W. AGNEW (accepted)	227	19	0

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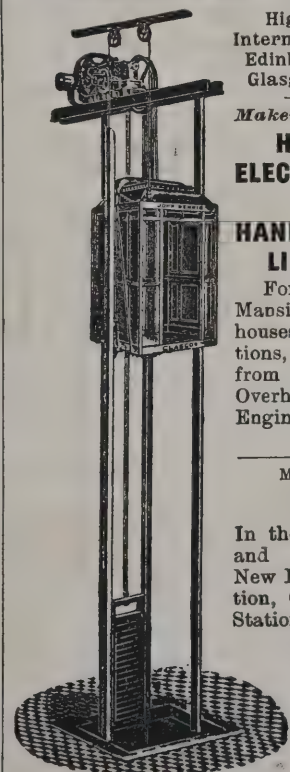
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## ISLEWORTH.

For cleaning and painting the exterior wood and ironwork at the union offices, the infirmary and the schools at Isleworth.

*Accepted tenders.*

A. Cutler, Hounslow, painting exterior of schools	£326	0	0
T. Nichols, Church Street, Chiswick, painting exterior of infirmary	216	0	0
T. Nichols, painting exterior of union offices	38	15	0
T. Nichols, repairs to stone staircase at union offices	13	10	0

## LEYTON.

For construction and laying of movable wood flooring and supporting trestles over the first-class swimming-bath at the public baths, Cathall Road, Leytonstone, Essex.

*Oak.*

W. T. Crosse	£825	0	0
J. & J. Dean	715	0	0
H. Wood	660	0	0
J. P. Robey	600	0	0
W. Gregar & Son	594	0	0
T. G. Sharpington	568	0	0
C. Shuter & Perrott	555	0	0
F. J. Coxhead	553	0	0
W. C. Ripper	550	0	0

*Pitch pine.*

W. T. Crosse	563	0	0
J. & J. Dean	540	0	0
H. Wood	475	0	0
J. P. Robey	460	0	0
W. Gregar & Son	448	0	0
T. G. Sharpington	440	0	0
C. Shuter & Perrott	390	0	0
F. J. Coxhead	393	0	0
W. C. Ripper, Castle Heading (accepted)	350	0	0

## LIVERPOOL.

For painting and cleaning portions of the interior of the work-house, Brownlow Hill.

F. BAGE & SON, Slater Street (accepted).

## LONDON.

For repair of internal roads at the Gore Farm hospital.

R. Ballard, Ltd.	£5,732
T. Free & Sons	6,651
H. Woodham & Sons	5,089
T. Adams	4,612

## ROAD MAINTENANCE AND STONE SUPPLY

CO., LTD, Gravesend (accepted)	4,544
J. Meston (withdrawn)	4,330

For wood-paving work at the Grove hospital.

C. W. Killingback & Co.	£79
R. Ballard, Ltd.	72

W. GRIFFITHS & CO., LTD, 35 to 39 Hamilton House, Bishopsgate Street Without, E.C. (accepted)

For erection of a female staff bath-room at the North-Weir hospital.

J. Peattie	£448
J. & A. Bartram	315
J. J. Richards	300
E. Wali	297
Martin & Goodchild	295
R. C. Scutt & Son	240
Gardner & Hazell	230
E. H. CRIPPS, 161 Kennington Road, S.E. (accepted)	229

For tar-paving works at the Grove hospital.

F. Hoffmann	£1,210
W. T. Merrin	279
G. Neal	232
Gardner & Hazell	225
Fry Bros.	196
J. Wainwright & Co., Ltd.	185
W. E. Constable & Co, Ltd.	185
J. Smart	162
F. G. SHEPPARD, Wiggis, Wimborne Road, Southend-on-Sea (accepted)	127

For erection of workshops in Hollybush Gardens. Mr. EDWARD BROWN, architect, Minorities, E.C.

W. G. Brown	£1,378
Johnson Bros.	1,218
Bishop	1,185
H. HOOD (accepted)	1,130

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**LONDON—continued.**

For erection of the superstructure of Cold Stores, Block D, and additional works to basement of B and C, at Greenbank and Morgan's Lane, Tooley Street, S.E., for the London Riverside Cold Storage Co., Ltd. Messrs. NEWMAN & NEWMAN, architects, 31 Tooley Street, London Bridge, S.E. Quantities by Mr. R. C. GLEED, 8 and 9 Martin's Lane, Cannon Street, E.C.

G. Parker	£26,879	0	0
Colls & Sons	26,212	0	0
Hall, Beddall & Co.	26,180	0	0
Patman & Fotheringham	25,793	0	0
Rider & Sons	25,563	0	0
W. Downs	25,444	0	0
Perry & Co.	25,157	0	0
J. GREENWOOD, Arthur Street West, E.C.			
(accepted)	24,467	0	0

or repairs to chimney-shaft at the Grove hospital.

G. Drake	£216	0	0
Gardner & Hazell	215	0	0
C. C. Gold	196	0	0
E. Wall	182	0	0
Alexander, Nevins & Co.	177	0	0
E. Beresford & Co.	170	0	0
Stephens, Smith & Co., Ltd.	165	0	0
Day & Ockelford	165	0	0
W. D. Berry & Sons	162	0	0
W. Brown	155	10	0
Universal Engineering Co.	117	10	0
W. HOGG & SON, Liverpool (accepted)	116	0	0

**NEW BARNET.**

or sewerage works, with manholes, gullies, &c. Mr. HENRY YORK, surveyor, Station Road, New Barnet.

W. M. Butcher	£3,212	2	0
E. Rogers & Co.	2,833	0	0
C. Ford	2,398	0	0
T. Adams	2,205	14	4
G. Bell	2,191	0	0
G. Rayner	1,995	0	0
W. S. Kitteringham	1,984	0	0
E. T. Bloomfield	1,920	0	0
J. A. Dunmore	1,864	0	0
R. W. Swaker	1,815	5	0
E. J. BETTS, Enfield Highway (accepted)	1,785	13	4

**NEWCASTLE-ON-TYNE.**

For sewerage works, &c, at Earsdon. Mr. J. R. MACMILLEN, surveyor.

W. Craig	£502	10	2
G. Simpson	501	5	6
Glen & Moffatt	489	6	0
J. McLaren	462	3	3
Edgar Bros.	454	9	5
J. COXON, Seaton Delaval (accepted)	426	19	4

**NORTON-UNDER-CANNOCK.**

For erection of Walsall Wood Board school. Mr. T. H. FLEMING, architect, Darlington Street, Wolverhampton.

Lynex	£2,895	0	0
Harris	2,816	0	0
Cave & Son	2,750	0	0
Willcock & Co.	2,689	0	0
T. & S. Ham	2,620	0	0
Tildesley	2,600	0	0
Wistance	2,549	18	0
Herbert	2,510	7	6
Gough	2,455	0	0
Speake & Sons	2,404	0	0
CRESSWELL, Walsall Wood, near Walsall			
(accepted)	2,321	0	0

**OTLEY.**

For street works in Jennett's Crescent, Granville Mount and Granville Terrace, and the paving of Back Jennett's Crescent and Dibb's Passage, Otley, Yorks. Mr. J. E. SHARPE, surveyor.

J. HANNAM, 39 North Street (accepted)	£698	4	3
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**OXFORD.**

For addition to and reconstruction of laundry at Radcliffe infirmary. Mr. J. AUGUSTUS SOUTTAR, architect, 41 Bishopsgate Street Within, E.C.

Accepted tenders.

T. H. Kingerlee & Sons, Oxford, builder	£1,225	0	0
D. & J. Tullis, Ltd., London, laundry engineer			

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## PARKESTON.

For erection of new schools for 570 children, and alterations to the present schools, boundary walls, playgrounds, &c. Messrs. START & ROWELL, architects, Colchester.

Oak Building Society	£6,875	0	0
A. E. Symes	6,679	0	0
C. & J. Ambrose	6,059	0	0
A. W. Robins	5,786	0	0
McKay	5,720	0	0
F. Bennett	5,181	0	0
W. Chambers	4,997	0	0
E. West	4,959	0	0
Grimwood & Son	4,885	0	0
E. Saunders	4,799	0	0
Theobald	4,592	0	0
Dupont & Co.	4,126	0	0
R. Beaumont	4,112	0	0
SMITH & BEAUMONT, Harwich (accepted)	4,096	0	0

## SCOTLAND.

For extension of the Cults water-supply works, Aberdeen. Messrs. WALKER & DUNCAN, engineers, 3 Golden Square, Aberdeen:

W. DURWARD, Clashfarquhar, Porththen (accepted)	£1,020	0	0
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For construction of a 7-inch cast-iron outfall sewer, about 220 yards in length, with cement concrete supporting wall, &c, from the Dreel Bridge to the sea, for the purpose of conveying the sewage from the western portion of the burgh of Anstruther Easter.

R. SKINNER, Balcormo Newton, Pittenween N.B. (accepted)	£305	15	7
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For granolithic pavements in Parkfoot Street, Main Street, Market Street and Burngreen, Kilsyth. Mr. JOHN T. BARTIE, engineer, 180 Hope Street, Glasgow.

D. MACWAIR, Falkirk (accepted)	£909	2	6
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## SHEFFIELD.

For erection of a public elementary school at Greystones, Sheffield. Messrs. HEMSOLL & PATERSON, architects, Norfolk Row, Sheffield.

ASH, SON & BIGGIN, Furnival Street (accepted)	£1,095	0	0
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## SHEERNESS.

For supplying and fixing at Sheerness, in one of Walter M. farlane & Co.'s iron clock towers now in course of construction, an eight-day illuminated turret clock to strike the hours on a 2 cwt. bell.

J. W. Benson	£151	10	0
W. E. Munn	140	0	0
F. Bullen	135	17	6
S. Smith & Son, Ltd.	130	0	0
Kendal & Dent	120	0	0
J. SMITH & SONS, Queen Street, Derby (accepted)	106	0	0
W. Potts & Sons	105	0	0
J. B. Joyce & Co.	93	0	0

## SOUTHAMPTON.

For the tar-paving of playgrounds, &c, at the Shirley Board school, Foundry Lane, Shirley, Southampton. Mr. J. C. H. BLIZARD, architect, Lansdowne House, Castle Lane, Southampton.

North of England Asphalte Co.	£1,043	12	0
J. Brook	1,015	7	0
Jenkins & Sons, Ltd.	869	0	0
Bradshaw & Son	849	0	0
Asphaltic Limestone Concrete Co.	811	19	1
WAINWRIGHT & CO., Shepton Mallet (accepted)	740	13	0

## SOUTHWOLD.

For sub-piling part of the cliff protection works.

Leggett & Speight	£1,498	0	0
G. Hayward	1,400	0	0
J. C. Trueman	1,298	0	0
W. Gradwell & Co.	1,154	7	0
W. King	1,030	0	0
Pedrette & Co.	987	5	6
T. W. PEDRETTE, Stamford Hill, London, N. (accepted)	980	0	0

## SURBITON.

For street works, about 400 yards, at Kingsdown Road, Surbiton.

London and County Builders	£2,109	6	5
S. Atkins	1,628	11	0
Parry & Co.	1,625	0	0
S. KAVANAGH & CO., Surbiton (accepted)	1,366	0	0
W. Adamson	1,295	0	0

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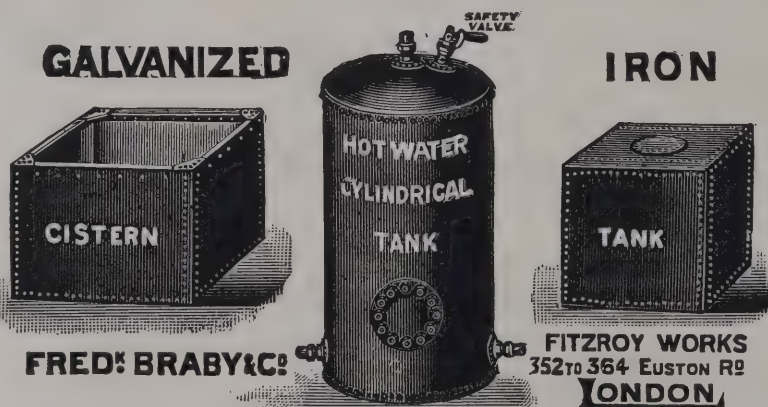
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WALES.		WALES—continued.	
r drainagework at Disserth Rectory, Llandrindod. Mr. GLENDINNING MOXHAM, architect, Swansea.		For repairing, fitting-up and furnishing the branch library, Pentreguinea Road, St. Thomas.	
PRICE & WILLIAMS, Builth (accepted)	£192 10 0	T. Marles & Son	£123 0 0
r erection of two houses at Cwm, near Ebbw Vale. Mr. GEORGE ROSSER, architect, 28 Risca Road, Newport.		D. Jenkins	118 6 0
Leadbeter Bros.	£685 0 0	J. & F. WEAVER, Manselton Steam Joinery Works, Swansea (accepted)	85 0 0
WILLIAMS & ROGERS, Cwm, near Ebbw Vale (accepted).		For rebuilding shop, 19 High Street, Swansea. Mr. GLENDINNING MOXHAM, architect, Swansea.	
F. Moore	545 0 0	H. BILLINGS, Swansea (accepted)	£880 0 0
	375 0 0	For sewage works (about 1,000 yards) in New Road, Ynysybwl, Mountain Ash. Mr. JOHN WILLIAMS, surveyor, Mountain Ash.	
r extension of barrel culvert at Penydarren, Merthyr Tydfil. Mr. THOS. F. HARVEY, engineer.		Williams Bros.	£399 7 10
C. P. DAVIES, Dowlais (accepted)	£303 14 3	T. Evans	362 2 11
r erection of town clock at town hall, Merthyr Tydfil. Mr. THOS. F. HARVEY, surveyor.		R. Webb	287 3 9
C. H. FLOODS, Merthyr Tydfil (accepted)	£135 0 0	J. SUTHERLAND, Glancynon Terrace, Abercynon (accepted)	285 3 2
r erection of a house at the Olchfa, Sketty, Swansea. Mr. GLENDINNING MOXHAM, architect, 39 Castle Street, Swansea.		For erection of a shop at Ystalyfera. Mr. GLENDINNING MOXHAM, architect, Swansea.	
Lloyd Bros.	£2,770 0 0	Marles Bros.	£710 0 0
J. & F. Weaver	2,650 0 0	B. Lewis	610 0 0
D. Jenkins	2,645 0 0	D. REES, Ystalyfera (accepted)	512 10 0
H. Billings	2,630 0 0	For additions to Alltyferin, Carmarthenshire. Mr. GLENDINNING MOXHAM, architect, Swansea.	
Walters & John	2,600 0 0	Bennett Bros.	£1,020 0 0
J. Davies	2,576 0 0	H. Billings	995 0 0
BENNETT BROS., Swansea (accepted)	2,547 0 0	WALTERS & JOHNS, Swansea (accepted)	950 0 0
r erection of a pair of cottages, Murton, Swansea. Mr. GLENDINNING MOXHAM, architect, Swansea.		WHITECHAPEL.	
H. Billings	£596 0 0	For erection of new warehouses substructure. Messrs WILLIAM EVE & SONS, architects, 10 Union Court, Old Broad Street, E.C.	
T. DAVIES, Swansea (accepted)	520 0 0	Foster & Dicksee	£2,015 0 0
r erection of chancel to the church of St. Barnabas, Waunarlwyd, Swansea. Mr. GLENDINNING MOXHAM, architect, Swansea.		Holloway Bros.	1,785 0 0
J. Davies	£532 10 0	Perry Bros.	1,687 0 0
T. Richards.	532 1 0	Killby & Gayford	1,663 0 0
H. Billings	517 0 0	Nightingale	1,639 0 0
Walters & Johns	460 0 0	F. & H. F. Higgs	1,624 0 0
BENNETT BROS., Swansea (accepted)	459 0 0	Patman & Fotheringham	1,623 0 0
r additions to Brynabriallu, Swansea Mr. GLENDINNING MOXHAM, architect, Swansea.		HARRIS & WARDROP, Wallwood Street, Limehouse, E. (accepted)	1,549 0 0
H. BILLINGS, Swansea (accepted)	£250 0 0		

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## WREXHAM.

For widening of road and building new retaining wall at Wrexham Road, Pentre Broughton. Mr. ARTHUR WOOLLEY, surveyor, 2 Temple Row, Wrexham.

T. Jones . . . . . £267 0 0  
R. S. ROBERTS, Broughton (*accepted*) . . . . . 210 18 9

## WORTHING.

For supply and erection, &c., of steam and exhaust drain and other pipes, condensing plant, &c., required in connection with the first extension of the municipal electricity works. Messrs. BURSTALL & MONKHURST, consulting engineers.

BLACKWELL & CO., LTD. (*accepted*) . . . . . £438 0 0

For private street works in Bath Road, Sea View Road and St Valerie Road.

T. A. EAST (*accepted*) . . . . . £1,865 3 4

*Received too late for Classification.*

## LAINDON HILLS.

For erection of a bungalow on the Nightingale Estate, High Road, Laindon Hills, Essex, for Mr. J. B. Greasley. Mr. P. G. ASHTON, architect, Bank Buildings, 304 Romford Road, Forest Gate, E., and Ilford.

H. & H. BRIDGER (*accepted*) . . . . . £250 0 0

For erection of the Nightingale Stores, with stabling, High Road, Laindon Hills, Essex, for Mr. H. Foulger. Mr. P. G. ASHTON, architect, Bank Buildings, 304 Romford Road, Forest Gate, E., and Ilford.

CRABB & MAIDMAN (*accepted*) . . . . . £450 0 0

## LOWESTOFT.

For erection of Baptist schools in Grove Park. Messrs. G. & R. P. BAINES, architects, 5 Clement's Inn, Strand, W.C.

W. Knights . . . . . £2,040 12 9  
J. Welham . . . . . 1,812 10 0  
R. C. Todd . . . . . 1,799 0 0  
G. Elsey . . . . . 1,710 0 0  
Bedwell & Parker . . . . . 1,690 0 0  
C. R. Cole . . . . . 1,670 0 0  
C. E. EARL (*accepted with modifications*) . . . . . 1,466 17 0

## ILLUSTRATIONS.

HEADLAND HOTEL, NEWQUAY, CORNWALL.

A MYTHOLOGICAL SCENE.

LLOYD'S BUILDING, FENCHURCH STREET, E.C.: CLASSIFICATION ROOM.

APOLLO THEATRE, SHAFTESBURY AVENUE, W.

## BUILDING AND BUILDERS.

THE estimated cost of new workshops about to be erected for Mr. J. Joseph, of Hollybush Gardens, is 1,157. Mr. Edward Brown, of 150 Minories, London, E.C., is the architect.

THE new operating-room about to be built at the infirmary, East Dulwich Grove, London, will be from the designs and under the supervision of Mr. G. D. Stevenson, of 13 Regent Street, Cheapside, London.

A MEMORIAL-STONE has been placed in the spire which is being added to South Leith United Free church. The church was built over twenty years ago, and the spire, which will be 125 feet high when completed, was presented by a lady, Miss Cant, in memory of the life and reign of the late Queen Victoria. The stone, which was laid by Miss Cant, bore the simple inscription, "V.R. 1837-1901."

RICHARD WALLACE, a painter in the employ of the Ball Corporation, was engaged on Monday morning in painting property in Carr Lane, standing on a ladder about 20 feet high. The rung on which the man was standing gave way, and he fell to the ground. He was picked up insensible, and died shortly afterwards. He was 49 years of age, and it is reported that he has left a widow and eight children.

THE second annual excursion of the Master Builders' Association and Building Trades Exchange of Edinburgh took place last week to Alloa. A company numbering about fifty gentlemen travelled from the Waverley station to Alloa, thence in brakes to Rumbling Bridge. Rain fell heavily during the greater part of the day, but the weather cleared up in the afternoon, and the drive back to Alloa was made under pleasanter conditions.

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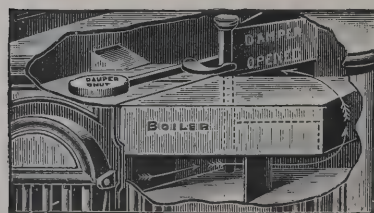
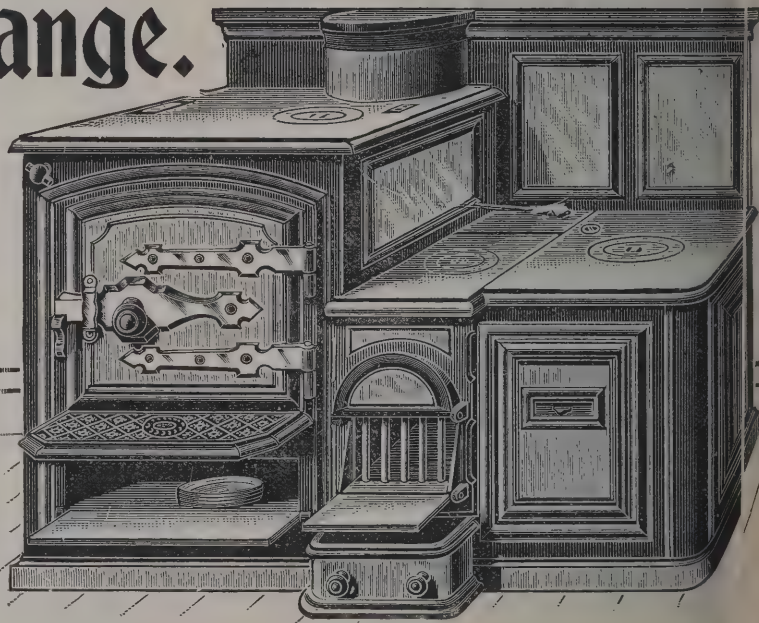
O'BRIEN, THOMAS & CO., Upper Thames Street;

R. H. & J. PEARSON & CO., Ltd., Notting Hill Gate;

ROWNSON, DREW & CO., Queen Victoria Street.

Agents for Liverpool:—

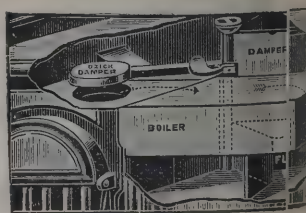
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The above shows the heat concentrated under the boiler and the waste heat passing under the hot plate.

This Independent Range is fitted with hot water circulating boiler as shown in the sections, and the heat of the fire passes direct under the bottom of the oven.

A Fire Brick Dome and damper is fitted over the fire, which enables the heat to be concentrated at pleasure on the hot plate or boiler, the waste heat of either passing under the other, thereby utilising what is usually lost.



The above shows the heat of the fire concentrated on the hot plate and the waste heat passing under the boiler.

The casing and oven door are lined with slag wool and a third oven can be arranged if required.



At the monthly meeting of the Ossett Town Council, held on Monday evening, Councillor Horsnell, chairman of the general purposes committee, moved the adoption of Part III of the Housing of the Working Classes Act, 1890. He stated that there was a considerable demand in Ossett for more working-class houses, and especially for those of an improved kind. A sub-committee had inquired into the matter and consulted the town clerk as to the Council's powers, and unanimously reported in favour of the course which he now proposed should be taken. Councillor Taylor seconded the motion, and mentioned that the Council had three or four acres of land that could be used for the purpose of building houses. The motion was supported by a number of members, and carried almost unanimously.

"ACCIDENTAL DEATH" was the conclusion arrived at at the coroner's inquest held in regard to Henry Russell (26), bricklayer, of 36 court, 6 house, Park Lane, who fell from a scaffold upon which he was working, near Trinity Road, Birchfield. Deceased was engaged in "filleting" a roof 21 feet from the ground on the morning of the 30th ult., and owing apparently to the step-board on which he was standing being slippery after the rain he lost his balance and fell over the side, sustaining a fracture of the breast-bone and internal injuries. He was removed to the General Hospital, but died on Friday morning last. Messrs. Wilkinson & Waterman, the builders who employed the deceased, stated, in reply to Mr. Jackson (inspector of factories for Staffordshire), that they were not aware that the Home Office had issued recommendations for carrying on of building operations with greater safety. They would be pleased, they said, to obey the suggestions of the Department.

### ELECTRIC NOTES.

THE Darlington and Tebay branch of the North-Eastern Railway crosses the river Eden at Kirkby Stephen at a point where the river forms a noisy and foaming cataract well known as the "Coopkarnel Hole." The North-Eastern Railway Company have for some time been engaged upon the erection of a power-house, and are now utilising the "force" at the waterfall for the working of a turbine and dynamo, to provide electrical power for the station and mineral sidings at Kirkby Stephen. Close to the spot whence the electrical power is derived the rocks in the bed of the river contain a great

number of holes, 1 to 7 feet in diameter and 6 inches to 9 feet in depth, whilst in some places the clefts or cavities are so wide as to receive the whole river, which in some seasons is thus rendered stagnant. To provide against a temporary failure of the water supply, the North-Eastern Railway Company are having an electric motor, which is replacing the present steam-engine for driving the machinery in the workshops, arranged so that it can be driven as a dynamo from the old steam plant, and so keep the accumulators charged. All the station buildings, locomotive workshops and sheds, signal cabins and signals are to be supplied with the electric light, whilst the cattle mount and turntables will also be similarly illuminated. The works are now practically completed, and the new illuminant was adopted on Friday last.

THE annual report of the Ayr Burgh electrical engineer (Mr. A. J. Fuller) states that the number of units sold for private lighting was 102,553, giving a revenue of 3,765*l.*; for public lighting, 330,560 units, giving a revenue of 2,147*l.*; and for traction, 132,105 units, yielding a revenue of 827*l.* The total revenue was 6,973*l.*, and the expenditure was 4,483*l.* The surplus balance of 2,490*l.* was 756*l.* short of meeting the payments to interest and sinking fund. The capital expended on the works to date was 78,999*l.*, an increase during the year of 22,841*l.* Mr. Young, convener of the lighting committee, stated that of 101 provincial towns reporting, only sixteen showed less works' cost than Ayr, the cost being 12*d.* per unit.

### VARIETIES.

NEW schools and lecture hall in connection with the Baptist church at East Finchley were opened on Sunday last.

THE new premises of the Manchester Zionist Association in Cheetham Hill Road were formally opened on Sunday afternoon by Mr. Jacob Moser, of Bradford.

SPECIAL arrangements have been made by the Chancery Lane Safe Deposit Company for the temporary safe keeping of securities to meet the public convenience during the holidays and long vacation.

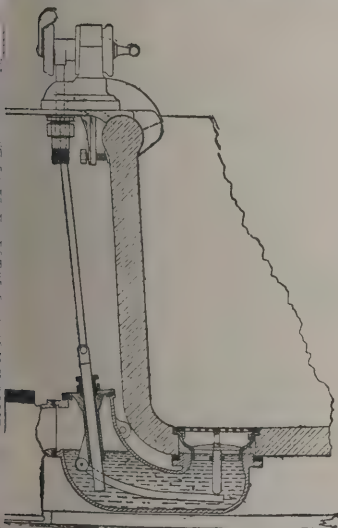
At a meeting of the committee of the Town Council of Crewe on the 4th inst. the competitive design of Mr. Henry T. Hare, F.R.I.B.A., for new municipal buildings was awarded the first prize. The new buildings are estimated to cost about 14,000*l.*

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AT the Sparkhill police court on Monday Mr. W. G. Madeley, chairman of the justices, announced that that was the last sitting of the Court in the Institute Buildings. Next Monday the business of the division will be transacted in the buildings which have recently been erected.

A NEW Board school for infants, built by the Stockton School Board to meet the requirements of Portrack, a working-class district of the town, was formally opened on the 2nd inst. The school has cost about 1,700*l.*, and will accommodate 200 scholars.

ON Saturday afternoon the Nurses' Homes erected near to Conon Bridge, Ross-shire, at a cost of 1,520*l.*, as a memorial to the late Sir Kenneth S. Mackenzie, of Gairloch, Bart., were declared open by the Dowager Lady Mackenzie, widow of the deceased, who was accompanied by Sir Kenneth J. and Lady Mackenzie and family.

THE open competition amongst sanitary engineers for the drainage of Eaton Bray, Bedfordshire, has resulted in the plans prepared by Mr. J. R. Elliott, A.M.I.C.E., of Nottingham, being selected as the best, and he has accordingly been appointed engineer to carry out the work. There were fifteen schemes submitted.

THE National Association of Master House Painters and Decorators of England and Wales will hold their ninth annual convention on the 23rd to the 26th of the current month. Mr. J. D. Crace, H.F.R.I.B.D., and president of the Institute of British Decorators, is to open the exhibition, and a carefully thought out programme has been arranged to combine business with social enjoyment.

A TERRIFIC gale from the south-east raged in the Lockerbie district on Wednesday in last week, doing great damage to property. About midday, when the storm was at its height, the front and central gable of the Carnegie Free Library, in course of construction, and composed of many tons of dressed stone, collapsed and fell on the street, and for some time completely blocked the traffic. Luckily no one was injured.

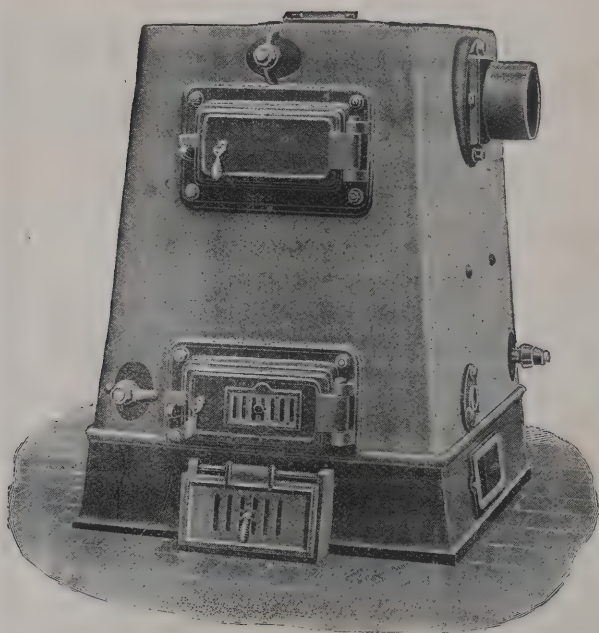
THE new schools erected at Spring Gardens, Stockport, which will accommodate 600 boys and girls in the mixed school and 220 infants in a separate infants' school, were formally opened on the 5th inst. Messrs. Stott & Sons, of Manchester, are the architects, and the builder is Mr. Josiah Briggs, Stockport. The principal room gives seating accommodation for about 1,000 persons. The style of the buildings

is English domestic, faced with red brick, with buff terra-cotta dressings and half-timbered gables.

THE Peter Memorial church, which has been built in the southern suburbs of Stirling for the United Free North congregation with money left by the late Mr. and Mrs. Peter members of the congregation, was opened on the 4th inst. by Mr. J. J. Stevenson, of London, is massive in character with a square tower intended to be surmounted by a crown, but which has, owing to the want of funds, not been proceeded with. The halls are commodious and convenient, and the whole building is lighted by electricity.

AT Pantasaph, Holywell, last week, was celebrated the golden jubilee of the Capuchin Order of St. Francis. At the same time the solemn blessing and opening of the new house for novices of the order, which has recently been erected and now forms part of the existing monastery buildings, took place. The novitiate is of local white limestone with Gwispur stone dressings, and is in the fifteenth-century style of architecture, in consonance with the older part of the monastery. The building is 112 feet long, 34 feet wide and 54 feet high, and on the ground floor there runs a continuous corridor 230 feet long. Pantasaph, it will be remembered, was intended as a Protestant church, erected by the late Earl of Denbigh when Lord Feilding, and Lady Feilding, but upon their entering the Catholic Church the new edifice was handed over to the church of their adoption, and directly afterwards the Friars of St. Francis Capuchin were invited to take over the charge of the church. Pantasaph therefore became the first foundation, after the relaxation of the penal laws, of one of the chief branches of the Franciscan Capuchin Order, which had come to England about 250 years previously. The community was formed in 1852, and their abode was the house once intended as the vicarage and now the guest-house of the monastery.

A GUIDE-BOOK that is well worth the perusal of those contemplating holidays is that issued by the General Steam Navigation Company, of 55 Great Tower Street, E.C. Besides a most attractive series of continental itineraries, covering Bordeaux, the Pyrenees, Auvergne, Algeria, Spain, France, Belgium, North Germany, Scandinavia, and Norway and Sweden, the company also affords exceptionally good facilities for visiting the Scottish Highlands. The convenience and comfort of passengers are studied in every way, and the tours are excellently designed. The company's steamers are well



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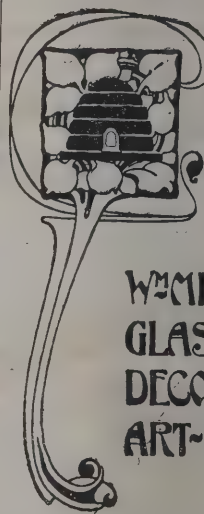
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printed and the cuisine all that can be desired. At all the principal resorts touched in the itineraries the leading hotels pour the G.S.N.'s coupons. Visitors to Scotland will find arrangement particularly handy. The cost of the Highland varies from 3*l.* 14*s.* 6*d.* for six days to 8*l.* 5*s.* for seventeen. The company is also running a service of daylight trips between London and Ostend. The twin-screw steamers "Lette" and "Swift" run from Irongate and St. Katherine's Pier, Tower Bridge, as follows:—From London, Tuesdays, Wednesdays and Fridays at 10 A.M., and Saturdays at 1 P.M., coming from Ostend Tuesdays, Thursdays and Fridays at noon, and Sundays at 1 P.M. A two days' trip to Ostend Saturday's boat (chief cabin), returning on Sunday, including board and carriage of bicycle, costs only 25*s.* 6*d.* A three days' trip, with meals on board and two complete days' hotel accommodation, with board, costs 31*s.* 6*d.* The boat saloon fare between London and Ostend (available for two persons) is 10*s.* 6*d.*, and the fore-cabin fare 9*s.*, but, of course, these charges do not include any meals. Altogether the facilities afforded by the General Steam Navigation Company are as good as any that can be found. The company will send on application (enclosing 2 penny stamps) to 55 Great Tower Street, E.C., a copy of the guide-book.

### TRADE NOTES.

MESSRS. COCHRANE & CO., LTD., Ormesby Ironworks, Loughborough, have received an order for 5,000 tons of 18-inch iron pipes in connection with the new waterworks scheme at Margate. The contract price is 30,000*l.*

THE additions to the Thornhill district hospital, Dumfriesshire, are being warmed and ventilated by means of Shorland's patent Manchester stoves with descending smoke flues and indirect exhaust roof ventilators.

MR. GEO. SHREWSBURY, of "Calda" fame, is just now putting out a series of price lists of his well-known hot-water heating apparatus which, as most of our readers are aware, covers a very extensive field, varying in cost from the modest radiatory heater at 19*s.* 6*d.* to comparatively elaborate installations suitable for the warming of halls, offices, &c. Shrewsbury also manufactures boilers of various kinds, dry and tailors' stoves, &c, while his excellent "Calda"

bath and lavatory heaters are too well known to need more than a passing reference.

MESSRS. GEORGE MILLS & CO., Globe Ironworks, Radcliffe, inform us that they have just received orders from the following companies for fitting up their premises with the "Titan" patent automatic sprinkler:—The Mutual Spinning Company, Ltd., Heywood (two mills); Arkwright Cotton Spinning Company, Ltd., Rochdale; Albany Spinning Company, Ltd., Middleton; and the Garfield Spinning Company, Ltd., Milnrow, near Rochdale; and that the following firms have just placed orders for their "Mills" horizontal flywheel pump:—The Gem Spinning Company, Ltd., Oldham; Monarch Spinning Company, Ltd., Oldham; Delta Spinning Company, Ltd., Oldham; Norman Spinning Company, Ltd., Oldham; Dawn Spinning Company, Ltd., Oldham; Magnet Spinning Company, Ltd., Oldham; Bank Top Spinning Company, Ltd., Oldham; Sun Mill Company, Ltd., Oldham.

### EAST FINCHLEY BAPTIST CHURCH AND SCHOOLS.

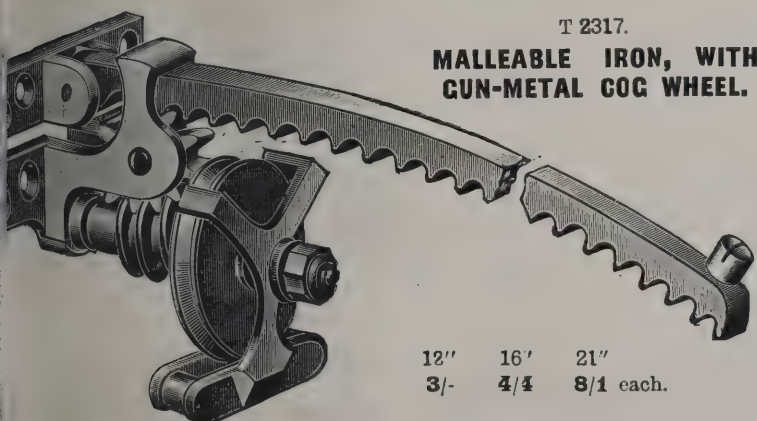
THE scheme for the erection of the East Finchley Baptist church and schools consists of a spacious church designed with nave and aisles and transepts and choir with three vestries, the seating all radiating on a circular plan from the pulpit. Accommodation is given for 764 adults on ground floor (including 72 in end gallery), or a mixed congregation of about 870 persons. A tower is placed at the corner of the church, which will stand at the corner of two roads, the Great North Road and Creighton Avenue.

The schools, which have now been opened, are of two storeys, consisting of a large hall with eight classrooms at the sides, partitioned off from each other by sliding panelled partitions, so arranged that the whole school can be thrown open into one large hall for use as a chapel until the new chapel is erected, and one at end opposite the platform. There are two front entrances and two staircases up to the galleries on three sides to be used for classes. There are also two very large senior classrooms in the rear, and a large infants' room, &c., and kitchen. The buildings are faced in front with split flints with stone dressings. Messrs. G. & R. P. Baines, 5 Clement's Inn, Strand, are the architects. The contract for the schools amounts to 3,634*l.*

# TONKS, Ltd.



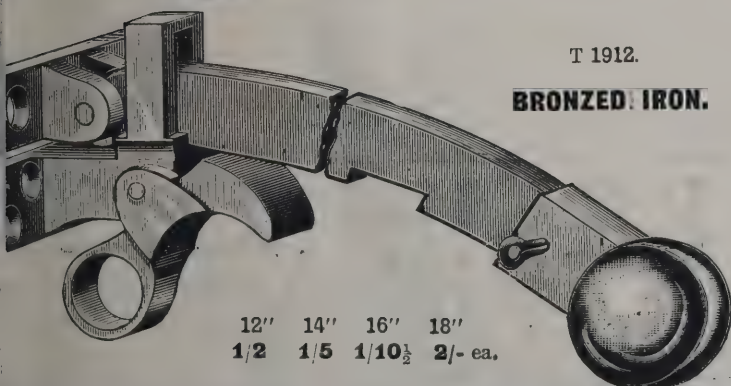
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1/2 1/5 1/10 2/- ea.

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and Securely Fastening  
Fanlights, Hoppers,  
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**THE SANITARY INSTITUTE HEALTH EXHIBITION.**

THIS Exhibition, which is being held in connection with the Sanitary Institute Congress, was opened by the Lord Mayor at St. James's Hall, Manchester, on Tuesday afternoon, the 9th inst. It promises to be one of the most successful of those arranged by the Institute. The time is too short for us to give particulars in this issue of all the various exhibits in which our readers would be interested, but we hope to do justice to them next week. As usual a strong committee of judges have spent considerable time and given careful consideration in awarding medals to the latest productions and to improvements in well-established specialties of the various firms exhibiting. We append the preliminary list of awards:—

**Silver Medals.**—British Sanitary Co., for self-acting earth closet; Cannon Iron Foundries, Ltd., for enamelled cast iron; F. C. Calvert & Co., for carbolic acid preparations; Chalmers & Co., for van ambulances; Davis Gas Stove Co., for Metropolitan cooker; J. Defries & Sons, Ltd., for saturated steam disinfectant; William M. Glover & Sons, Ltd., for dust van; John Jones, for automatic air-tight manhole cover; Mather & Platt, for water softening apparatus; Vernon Parker, for Hassall's improved safety pipe joint; Shanks & Co., Ltd., for cast-iron porcelain-enamelled bath with quick accessible waste; W. Summerscales & Son, for laundry machinery;

**Bronze Medals.**—Ames Crosta Sanitary Engineering Co., Ltd., for Crosta surface water gully, with complete double trap; Ames Crosta Sanitary Engineering Co., Ltd., for stoneware conduits for electric cables; Burn Bros., for improved ball stoppers; Chalmers & Co., for two-wheel dust cart; Geo. A. Chattock, for reversible locking window; Davis Gas Stove Co., for cottage grill; Doulton & Co., Ltd., for spray lavatory with self-regulating valve; J. Duckett & Sons, for flushing tank and tipper; Eagle Range Co., for "Eagle" fire-grate with sliding doors; Ewart & Son, Ltd., for improved geyser apparatus with flue and dual valve; William E. Farrar, for adjustable bracket; William E. Farrar, for bead rim lavatory basin; William E. Farrar, for lattice gear quick-opening valve; Fireproof Plate Wall Co., Ltd., for fireproof partition walls; Fletcher, Russell & Co., for "Hurst" pipe joint; William Henry Gibbs, for spiral drain scraper; Hard York Non-Slip Stone Co., for Non-Slip materials; Wm. Harriman

& Co., Ltd., for Ford's stable channel; George Howson & Sons, Ltd., for urinals; George Howson & Sons, for white porcelain-enamelled fire-clay bath; John Jones, for connection for water-closet basins to soil-pipe; John Jones, for air-inlet ventilator for drains; Kenworthy & Co., for equipoise wringer and mangle; Kenworthy & Co., for Paragon washer, wringer and mangle combined; F. Nicholson Law, for improved dry seat; Loco Drainage apparatus Co., for rust pockets; Mather & Platt, Ltd., for water filter; Matthews & Yates, for fans for ventilation; Mellows & Co., for Mellows's eclipse glazing; J. Oakley Co., for glazed stoneware pipes; Oates & Green, Ltd., for glazed manger, with give-and-take fastener; E. Palmer, for ventilating column fitted with water fan; Vernon Parker, for silica filter for attaching to a domestic tap; Pendleton Sanitary Engineering Co., for movable ash-bin with metal case; Richard Ravenor, for Ravenor's drain-tester; Sanitary Appliances Syndicate, for the non-ball valve cylindrical store cistern; Sanitary Appliances Syndicate, for coin-receiving lock; Didon & Co., for automatic discharge regulator for reservoir; Shanks & Co., Ltd., for hospital lavatory, No. 2,085; Slack & Brownlow, for germ filters; Sharratt, for sanitary formaldehyde regenerator; Thomas Henry Tonge, for bakery fittings; George Barber Wilson, for gully and trap dredger; Outram & Co., for the Hassall water-closet.

*Deferred for Further Consideration or Practical Trial.*—Sanitary Block and Tile Pavement Co., sanitary block paving; William E. Farrar, "Torfit" urinals.

**Disinfectants, &c.**—McDougall Bros., Killgerm Co., H. Sanitas Co., Ltd., Hope & Sons, Jeyes's Sanitary Compounds Co., United Alkali Co., Ltd., Newton, Chambers & Co., B. Kühn.

**Supplementary List of Awards.**

**Bronze Medal.**—Vernon Parker, for blue brickware drain pipes; J. Hutchings, for Hutchings's cooking steamers; O. Howson & Sons, Ltd., for wash-tubs on pedestals; Mather & Platt, for automatic distributing and flushing valves; Lonon Tablet Co., for non-absorbent wall and ceiling covering; A. Thornton, for surveying and drawing instruments; Whyp Bros., for "Non-flam" safety flannelette.

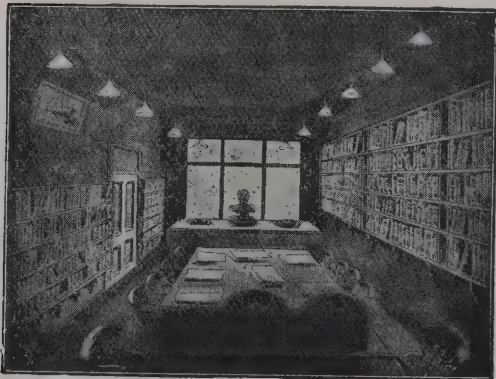
*Deferred.*—Mather & Platt, gravity filter.

We understand that a further list of awards may be issued this week, and we venture to hope that one or two exhibits that have not yet received the recognition deserved may be included in it.

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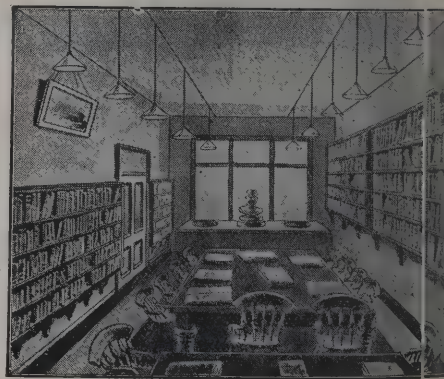
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# SONNING BRIDGES.

THE agitation in connection with the proposed renewal of the bridges at Sonning, to which we referred last week, has elicited the following statement by Mr. T. Neighbour in the *Times* :—

As a member of the roads and bridges committee of the Oxfordshire County Council and also of the sub-committee which was appointed to inspect and report on the repair of the Sonning bridges, I ask you to allow me to state the plain facts of the case, so that the apprehensions which have been caused by the articles in your issues of August 28 and 29, and by the chorus which has been taken up by the lesser Press in consequence of your utterances, may be somewhat dispelled.

On April 19 this year local representations were laid before the roads and bridges committee, which consists of twenty members out of a total of fifty-nine in the whole Council, that attention to the condition of Sonning bridges could not any longer with safety to the traffic be delayed. A sub-committee, consisting of the chairman, Lord Valentia, and three other members, was appointed, who visited the bridges in company with the county surveyor and made a thorough examination of the structure. They considered and declared that it was absolutely necessary that the matter be taken in hand at once. In dealing with a business of this sort there are no considerations which I have not yet seen mentioned by any newspaper correspondent which it was absolutely necessary should be taken into account. First, the bridge must be strong enough to bear "the ordinary traffic of the district." The ordinary traffic of the district to-day includes steam traction-engines and the loads they draw. The second consideration is facility for the rapid passage of flood-water. Some hundred yards above this bridge the Conservators of the river Thames have recently put in a new weir, and the quantity of water which will in times of flood pass down the back stream—over which and over the mill-race these bridges go—will be greater than it ever was before. Two miles above this weir, on low-lying ground, the district of Lower Caversham is building houses and making streets with great rapidity, and it is probable there is no part of the river here provision for the effectual passing off of flood-water is more necessary than it is at Sonning. The existing bridges are composed of a brick pier by the French Horn, two short pieces of brick bridge somewhere near the centre of the whole, and a brick pier near the entrance to Mr. Witherington's mill. The intervening distances are spanned by wooden bridges

consisting of oak decking carried on "a forest of piles." I plead guilty to being the author of the rhetorical phrase to which your correspondent takes exception, the open side spaces being guarded by an iron beam and iron railings. The width along the whole length is 15 feet. I appeal with confidence to any one who has a knowledge of the river Thames in the winter as well as in the summer—which so many who talk about it do not possess—to say whether anything could be devised more likely to collect all the debris which floats down the Thames on the first heavy water in the autumn, and more certain to impede the flow of the water and impose a great and unnecessary strain on the structure which so retains such rubbish, than are the piles which to-day carry Sonning bridges.

It is absurd to speak of a blank cheque being given to the county surveyor; on the contrary, different plans of dealing with the bridges were discussed at great length and with great care at meetings of the sub-committee and of the roads and bridges committee at dates extending from April 19 to July 19, and the method which was finally recommended to the Council for adoption on August 6 was as follows:—The brick piers at either end of the bridges are to be widened and strengthened; the brick bridges near the centre are to be widened only, all on the up-stream side; and in place of oak decking and piles the spaces between the brick parts will be carried on steel girders, these girders to have one intermediate central support in the stream nearest the French Horn and two supports at equi-distances in the stream nearest to Sonning Mill. The sides of the bridges will be guarded by a lattice girder in place of the existing iron-rail fence, and this I somewhat regret. But I do most positively affirm that on the only public pathway from which the bridges can be viewed the sole visible alteration will be the lattice girder just referred to and the substitution of three very narrow supports in place of the oak piles. So far from the present appearance of the bridges being left out of sight it was a matter of earnest endeavour to retain it, and while having due regard to the widening and strengthening, it will be very largely preserved.

The division at the Council did not take place on the question of whether the alterations should be made or whether the plans were suitable, but simply whether it would be wise to proceed without the sanction of the Conservancy. No fear need be felt as to this. Everything that takes place at a public meeting does not find its way into the columns of the report, and an intimation was given even on August 6 that the scheme would without doubt receive the sanction of the Conservators.

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Although the plans were not actually in the room at the time they were asked for, they were there within two or three minutes and were generally inspected, with the result that even those members who had at first demurred to the scheme afterwards expressed their approval. It is not to be expected nor, I suppose, desired that any public alteration should be carried through without meeting with public criticism; and in connection with this matter I personally am rather glad that the thing has been well ventilated, so that presently, when the work is completed and attention is again drawn to it, the action of the Council will be held to be justified.

### BRICKMAKING AND SANITARY LAW.

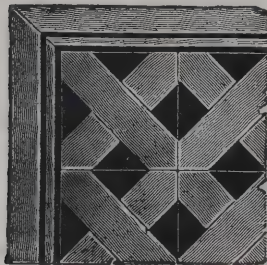
At the Sittingbourne Petty Sessions on Monday, Messrs. Smeed, Dean & Co., Ltd., of Sittingbourne, were summoned by the Sittingbourne Urban District Council under the Public Health Act of 1875 by reason of a nuisance arising from a large accumulation of London refuse upon their brickfield. On July 11 this heap of refuse, which was 40 yards long, 30 yards wide and 2 yards high, and is about 1,200 or 1,300 yards from the town hall, became ignited, and the fumes beat down into the town, causing much discomfort to the inhabitants. The evidence showed that correspondence had passed between the Council and the firm upon the subject, but no attempt had been made to put out the fire. Proceedings then followed. The London refuse, it was stated, consisted of the garbage and filth of the Metropolis, and the smell emitted from this when burning was unbearable. It was contended that this refuse was the rough stuff which had been sifted after the ashes used in the burning of bricks had been taken from it, and that for purposes of brickmaking it was useless. It was suggested that the defendants might have put up a destructor, as had already been done by one local firm with success, or they might have cut a trench through the heap and separated the burning portion, extinguishing the same with water or smothering it with earth. To all of these suggestions it was stated that those methods had been tried on previous occasions, and that the remedy was worse than the disease. Evidence in support of the prosecution was given by Mr. W. L. Grant (surveyor), Dr. H. G. Sutton (medical officer of health), Drs. F. Grayling and R. M. Boodle and Mr. F. G. Gibson (chairman of the Council), who spoke of the acrid, pungent nature of the smoke emitted from the refuse, which carried a long distance. The principal

witness for the defence was Mr. George Andrews, the manager, who said that his firm employed 1,400 hands and paid on 70,000l. to 80,000l. every year in wages. For the past 15 years the firm had burnt "rough stuff" without any prejudicial effect to health. What the public suffered from was, he maintained, the smell of the open sewer discharging crude sewage into the creek, of which complaints had been made by his firm to the Council for years. No attempt had been made by the defendants to put out the fire, as it was impossible to do so. It was stated that men working among the "rough stuff" had not suffered in health, but they had done so in consequence of the foul exhalations of the open sewer. The Court held in the case had been proved, and the defendants were fined 20s. were ordered to prevent a recurrence of the nuisance at their own cost, and to pay ten guineas costs. Notice of appeal to the quarter sessions was given.

### ELECTRIC TRAMWAYS IN LONDON.

SINCE the introduction of electric tramways in London last year extraordinary progress has been made (says the *Standard*) with this convenient and clean form of traction. True, the advantages have so far rested with the residents of West London, but it will not be long before electricity will supplant horse haulage on the southern routes of the London County Council, and then we shall have an excellent opportunity of judging the relative merits of the overhead trolley and the conduit systems of electric traction. The experts have been left to fight out amongst themselves the question which is the better method; the general public will doubtless vote for the cheapest, fastest, and most frequent and reliable service, and the most comfortable cars, irrespective of whether the motive power comes from underground or overhead.

Meanwhile, in view of recent and future developments it will be interesting briefly to relate the history of electric surface traction, having particular regard to the great progress it has made in London, and it will be seen that, considering the enormous difficulties which have had to be overcome, we are not so backward as is sometimes thought. Twelve years ago the passengers carried by tramcars in the whole of the United Kingdom numbered one million and a half a day, and of these London supplied one-third, although it had only one-eighth of the total mileage. In 1900, thanks to the introduction in various towns of electric traction, the passengers



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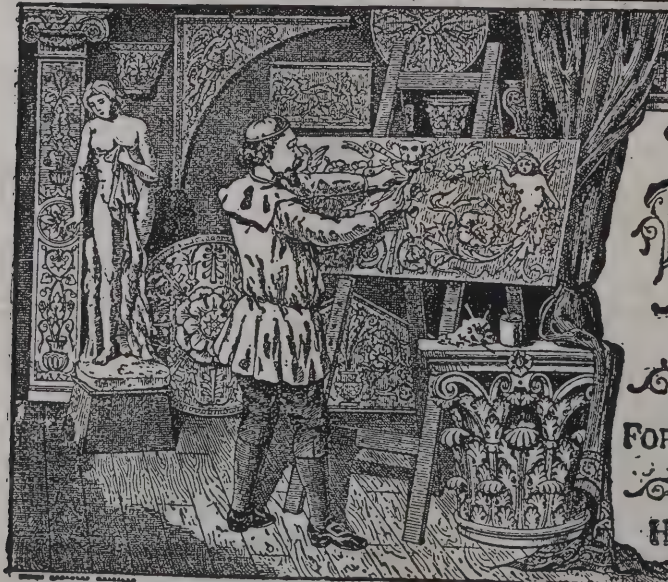
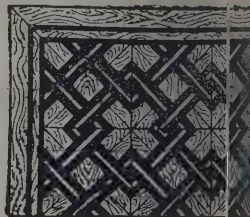
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umbered over 1,198 millions, and during the previous five  
ars 200 miles of track were added.

The first electric tramways operated in London were those  
om Shepherd's Bush to Acton, from Chiswick to Kew Bridge,  
nd from Hammersmith to Young's Corner, and these cars  
mmenced running in April last year, the whole distance  
ing 7½ miles. Since then great strides have been made, and  
ow it is possible to travel direct to Southall, Hounslow Heath  
nd Twickenham, and in the course of a few days Teddington,  
nd even Richmond, will be within a little more than an hour's  
omfortable journey from the centre of the city. But further  
r-reaching extensions, for which of course the necessary  
owers have been obtained, are in progress. To the west and  
uth-west the electric routes are shooting out and embracing  
the growing suburbs in the Thames Valley, and in a very  
w months we shall be "whizzed" in the open air to  
ampton Court, Kingston, Thames Ditton, Surbiton and other  
pulous districts. Nearly one hundred miles of tramways  
ill then be in operation on this particular system, and it is  
culated that no fewer than 200,000,000 passengers will be  
ried every year. The London United Tramways routes are  
rtunate in having the "Twopenny Tube" to connect the  
ank with the Shepherd's Bush terminus, and the Metropolitan  
nd District Railways to link the City with Hammersmith  
roadway. No doubt all the companies concerned, as well as  
e public, gain by these facilities for intercommunication,  
rticularly the Central London Railway with its frequent and  
pular service throughout the day. It is a matter for regret  
at the Metropolitan and District Companies cannot yet offer  
more attractive service, but that is only a matter of time and  
electrification." When the heavy and anxious task of con-  
rting the southern tram routes is completed, the London  
ounty Council will no doubt emulate the London United  
ramways and open up new districts and link others, and by  
at time—it is in the near future—London will be a con-  
nient place to live in and an easy place to get away from.

THE SANITARY ASSOCIATION OF SCOTLAND.

r the annual congress at Kirkcaldy. Dr. James B.  
ung, Edinburgh University, initiated a discussion on  
e provision for, and the maintenance of a wholesome  
mosphere in buildings, factories, workshops, workplaces,

&c., with special reference to the necessity for standards of  
pure air in such places. He said that in estimating the purity  
or otherwise of the air of occupied rooms, &c., the amount of  
carbonic acid present was generally taken as the index of  
pollution. For schools, churches, halls and public meeting-  
places generally ten parts per 10,000 might be taken as an  
attainable standard for good ventilation. For ordinary work-  
shops, e.g. where such industries as tailoring, printing, book-  
binding, dressmaking, &c., were carried on, a standard of  
purity in terms of carbonic acid should be fixed. The difficul-  
ties of ventilation there were not great, and the necessary  
means need not be very expensive. Very efficient fans, readily  
fixed, were now procurable at moderate cost, and electric  
current for driving them was, in most of our large towns, fairly  
cheap. One thing which had frequently struck him was that  
means of ventilation, which were amply sufficient, had been  
in many workrooms provided, but were not made use  
of, or only when the atmosphere became unbearable to some of  
the workers more sensitive than their neighbours. Whatever  
means were adopted they should be the simplest consistent with  
efficiency, and should be in charge of some responsible person,  
whose duty it should be to see that they were properly used.  
If a standard of air purity were prescribed and enforced,  
employers of labour would in self-protection see that the means  
of ventilation were regularly and properly used.

The president, Professor Glaister, said that in his experience  
the difficulty was not in the institution of measures of ventila-  
tion, but in seeing that they were carried out. It might be that  
in a particular workshop some employé who did not like what  
was called fresh air stopped the operation of the fan or plugged  
up the ventilating apparatus. The whole history of sanitary  
legislation in reference to the Factory and Workshop Acts had  
determined that they had got to protect the workman against  
himself. In the suggestion of a standard, four things were  
required—first, a minimum standard in terms of carbonic acid;  
second, that appropriate means of ventilation should be insti-  
tuted to keep to that minimum standard; third, that the owner  
or occupier of the workshop should be charged with the obli-  
gatory duty of seeing that the ventilation was carried out; and  
fourth, that the inspector of workshops should be compelled to  
test the air for analysis just as they took samples of adulterated  
goods.

Mr. J. H. Waterston, Edinburgh, read a paper on the  
Factory and Workshops Act, 1901, and its effect on local  
administration. He spoke of the undue complexity in the

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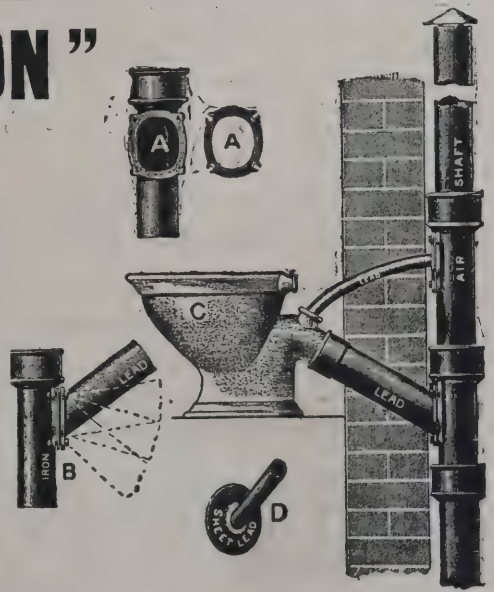
Junction has been invented with a view to enable anyone fixing closets overcoming the difficulty of the  
any angles required for the various makes, also to avoid the necessity of having joints inside the walls, which  
dangerous and not allowed by County Councils, Borough Engineers, Architects, &c. The 4 inch Junction can  
be adapted to any size from 4 inch downwards. Any plumber will see at a glance the great convenience of this  
as it only requires one junction for the many shapes and sizes. No Brass Thimbles or Calking required.  
Hot Gas and Watertight Joint can be made in a few minutes by any ordinary Plumber. In fixing this Joint,  
it is necessary to cut the Lead Pipe to the required angle, place on the loose Iron Flange, then flange back  
the Pipe ½ inch all round, coat the face of Flange with a little Red Lead Putty, bring the two Faces together  
and screw up with the Bolts, screwing up each Bolt a little at a time until they are all tight, then the Joint is made  
and will stand any test. Another great convenience is:—In case of any alterations or renewal of Soil Pipes, all  
required where this Junction is used is to unbolt the same, and the Closet and Pipe leading to it are left  
untouched. With all other Junctions it is necessary to take down the W.C., break open the wall, damaging the Pro-  
perty and causing other inconvenience.

- A—Is the front view of Junction and loose flange; the inlet being elongated, allows the lead pipe to be cut  
to any required angle.
- B—Shows the Joint fixed and ready for tightening up, and also a few of the angles which can be got.
- C—Shows the one size which can be adapted for 4 in. Soil Pipe, and a 4 in. x 1½ in. Invert Junction for Anti-  
siphon Pipes, &c.
- D—Shows how to arrange for a small sized branch.

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wording of legal enactments and the urgency of simplification and directness. So far as factory and workshop legislation was concerned they had some relief in the consolidating and amending Act of 1901. He gave a description of the provisions of the Act. The crux of the Act would lie in its administration. In default of efficiency in that respect it would, as regards protection to the workers, be without practical result. Speaking of the dangers of official overlapping, he said that there was created a situation of some complexity. They had now and again painful examples of friction between public servants, who by giving rein to their professional jealousies, advertised their own incompetence and endangered the interests of those whom they were paid to serve. The time had come when public servants who were foolish enough to obtrude their little weaknesses to the detriment of the public service would either require to adopt a more sensible rôle or suffer official extinction.

Mr. George Smellie, convener of the public health committee, Partick, read a paper on the housing of the working classes. He said that municipalities, as opposed to private effort, had certain advantages. They borrowed at a lower rate of interest; could from time to time better invest returns, and so with the best result, accumulate sinking funds. They could erect and hold larger blocks, making it convenient and practicable to have resident caretakers, with resulting advantages of economy in upkeep, fewer bad debts, and a general maintenance of order and tidiness. On the other hand, the private trader had certain first cost advantages. He saved contractor's profit, saved an architect, measurer, inspector and general administration, saved on interest during construction by studying chance of securing tenants and by throwing energy into the completion of his work. The strong point in favour of municipal or company schemes lay in their making a resident caretaker possible and practicable. Any municipal building scheme must of necessity be so limited in its nature and involve so many questions in selection of tenants and in defining and limiting the class of individuals for whom houses were available, that it became impossible by municipal building methods to deal with the evils to such an extent that any practical advantage would be secured. Probably for a limited time municipalities by modifying rates on houses of not more than two sleeping apartments might induce the private builders to erect blocks with desirable sanitary surroundings to be ultimately acquired by companies and managed under resident caretakers. Ultimately, when the

practice had become more general, the investing public would take kindly to the resident caretaker, and smaller but more certain returns. Slums would then gradually disappear. Why should any municipality play into the hands of the enemy and acquire decaying property at an artificial and inflated value? Time would silently but steadily dispose of the present insanitary buildings. In all the circumstances it would probably be found that municipal building schemes would not do more than touch the hem of the garment, and, on the other hand, involve the municipalities in speculation and complications, the ultimate results of which were not readily foreseen, and at the same time interfere with the private builders who at present erected large numbers of workmen's dwelling-houses every year.

Mr. Peter Fyfe, Glasgow, stated that the Corporation of Glasgow did not profess to have seriously tackled the question of the housing of the poor. It was, however, their intention to do so now, and with that end in view they had purchased twenty or thirty acres in the east end of Glasgow. They had invited architects and builders to furnish plans, showing single apartment houses, with a rental not exceeding 5% per annum, two apartments not exceeding 8%, and three apartment houses not exceeding 13%. He maintained that the building of houses for the poor would be better done by municipalities, or by some other responsible body, who would appoint caretakers, than by private interest, because private interest could not possibly have interest for the public good.

Mr. J. H. Waterston drew a distinction between the inhabitants of the slums and the ordinary working man, who required nothing from either the Corporation or private builders but a fair field and no favour. The real solution of the problem was to have these houses built by the Corporation, who would put in a proper caretaker. He believed they could supply good sanitary houses at a lower rent than was being paid for slum property. The question would not be dealt with efficiently until the land question was put on a proper basis.

Dr. Barras maintained that municipalities could deal with the question better than private individuals, but he asked why should the municipalities be called upon to face such a problem when the truth was that an immense number of people would do nothing for themselves?

The President said that unless they defined their terms they would make no progress. No commission would be of any avail unless it defined at the very beginning who were to be the poor. Unless that was carefully done, they would get on to

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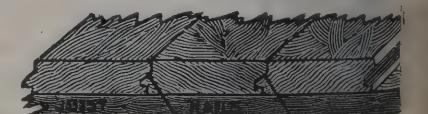
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of evidence which would be absolutely irrelevant in the solution of the problem.

On the motion of the President, seconded by Mr. Peter Tyfe, it was decided to continue the remit to the Council on the housing question, and to offer evidence to the Municipal Commission to meet in Glasgow on the same subject.

### SANITARY HOUSE DECORATION.\*

On commencing the sanitary decoration of a house begin at the top, in the loft if there is one, and work downwards, cleaning and removing dirt from all recesses and hidden corners as you go.

Such places are often overlooked and left as disease spots in a smart house. The loft especially receives the floating dust and impurities in the vitiated air arising from the lower parts of the house; therefore clean it out, remove all dirt, provide a skylight that can be opened and brush down and whiten every part of the walls, floor and under surface of roof, either with lime wash or carbolic distemper.

Do not leave the open joisting and rough plaster to accumulate more dirt, but put a thin flooring all over the loft, and thus gain useful storage room, which being lighted and ventilated will make the whole house healthier. Where air and sunlight enter microbes will be conspicuous by their absence. Sunlight is a great germ-killer, wherefore all dwelling-rooms should have ample windows.

Descending to the sleeping apartments, and having perhaps admired the beauties of the smart new decorations, let us peel off that little piece of loose paper on the wall. To our horror we find that the "decorator" has forgotten to strip the walls before repapering them, and here are five or six layers of dirty old paper and decayed paste, in all probability holding vermin or even the germs of disease, behind the newest paper.

Let it here be uncompromisingly stated that every scrap of old paper on walls or ceilings and all old distemper should be soaked, scraped and washed off to the bare plaster, except perhaps in the case of a tightly hung varnished or painted paper, which already presents a solid impervious surface. Insist, as one of the first principles of sanitary decoration, on the stripping of walls and ceilings, and disregard all pleas or fears as to fetching down the loose plaster. If the plastering

\* Abstract of paper by Mr. Louis Hanks read at the Sanitary Congress, Manchester.

is so weak that it is held up by the paper or old whitewash that is surely a pretty good indication that it needs repair.

The desirability of enforcing the stripping of old wall-paper and distemper by the passing of a by-law to that effect may be commended to the attention of sanitary authorities.

Always use some disinfectant in the water employed in stripping and washing down the interior of a house, both as a sweetener of the rooms and as a protection for the workmen in case there may have been infectious illness on the premises. Safe and effective liquid disinfectants are so cheap nowadays that there is no reason for omitting this simple precaution.

A solution of soda in warm water facilitates the removal of old paper and the effective cleansing of the surface.

Wherever there is a sign of dampness trace and remedy it at its source, to protect health and to prevent damage to the decorations.

In slight cases it may suffice to line the damp wall surface with lead foil or pitch-paper, or to paint it before repapering, but all serious dampness should be thoroughly removed.

Having stopped all cracks or imperfections in the plaster with Parian or Keene's cement and rubbed down the plaster to an even surface, the walls and ceilings are ready for decorative treatment, which must of course depend on individual taste and the finances at command.

In "clairecolling" or sizing walls or ceilings preparatory to papering, and also in the process of distemping, the smell of size is often very offensive, and this is not to be wondered at when its organic nature is considered.

This odour can be almost entirely neutralised by the addition of a gill of turpentine to a pailful of melted size or distemper. This is actually an improvement to the body and binding properties of the material as well as a deodorant.

In hanging papers, embossed pulp, or canvas materials on painted or varnished surfaces, a clairecolle of size and soda should be used—half a pound of soda to a gallon of melted size—to give a "bite" to the material to be hung and to prevent blistering. The clairecolle for unpainted surfaces should be melted size with a little whiting and turps as aforesaid, no water.

Many of the sanitary, washable distempers or water paints—so justly approved and largely employed nowadays—contain a percentage of turpentine, boiled oil, or other vehicles, as well as an admixture of dry white lead, zinc white or soluble glass, together with some disinfectant. Such truly sanitary pigments cannot be too highly commended, as they are cheap, produce

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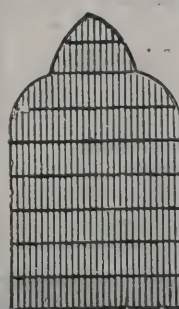
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artistic and durable effects and possess better covering properties than oil paint. One hundredweight of such a distemper will cover 840 square yards, while the same quantity of oil paint will only do an average of 500 square yards.

Little need be said as to the composition or application of paint to walls or woodwork beyond urging the use of zinc white (oxide of zinc) or Charlton white, as being non-poisonous and therefore more sanitary than white lead (carbonate of lead), the poisonous nature of which is well known, although it may be safely used with proper precautions.

If white-lead paint is used it should be genuine old, ground white-lead, mixed with pure American turps and Baltic linseed oil, with the addition of litharge driers or terebene, according to the weather in which it is used; and such paint gives off little or no odour or volatile particles.

Do not use cheap white lead, as it is often adulterated with barytes (sulphate of barium), and avoid "young" or new lead as it is deficient in covering properties and damages colour in its oxidation. White paint is the most healthful of all paints, because, apart from its artistic effect, it shows dirt better than coloured paint, and thus indicates the necessity for cleaning. A glossy surface is more sanitary than a dull or "flatted" surface, as it affords less hold for dirt. In selecting papers or decorations for the walls of bedrooms, and indeed for all living rooms, avoid large, staring patterns and aggressive contrasts of primary colour in masses. The less pattern there is the better; a simple background of agreeable tone is more restful and suited to a bedroom than any assertive decorative treatment.

A room simply decorated with a pale cream (not blue-white) ceiling and cornice, cream enamelled woodwork, and papered, painted or distempered walls in a tint of soft non-arsenical green or blue for a warm, sunny aspect, or in warmer tones of terra-cotta, pink or yellow for cold, dark rooms, will be quieter and more soothing to the senses and thus more conducive to repose than more gaudy treatments.

In purchasing paperhangings take care to procure them from a firm of repute, who can furnish an authentic guarantee that no arsenical colours or other poisonous ingredients are employed in the process of manufacture.

The fermentation of the paste used in hanging papers and relief materials is a danger which can be avoided by the addition of a lump of alum, the size of a filbert, to a pail of paste.

This helps to thicken the paste, giving better and more adhesive body, as well as having a hardening and non-fermentive action.

The addition of a small quantity of oil of cloves also assists in checking fermentation.

Lastly, we have to consider the floor, which should be sized and varnished all over, merely having a loose rug, thus providing a thoroughly sanitary surface which can be kept clean and germ-free without the use of the scrubbing-brush. All open joints should be stopped to prevent dust dropping through into the space beneath. Permanganate of potash is an excellent dark stain for clean floor boards, and has the additional merit of its disinfecting qualities.

The same general principles apply also to the decorative treatment of the reception-rooms, staircase, &c., elaborated to whatever extent artistic inclinations or means may permit.

Paperhangings, where used, should be preferably those with a hard, smooth surface, such as the hot-pressed silk fibres or oil-printed papers, not flocks nor mica papers, which catch the dust, and whose particles become detached in course of time thus failing to comply with sanitary requirements.

Painted and panelled walls and ceilings, hand-painted decorations of flat ornament in monochrome, colour or stenciling, with the embellishment of gilding in mouldings and other ornamental details; plaster or compo-mounted enrichments, hardwood panelled wainscoting, parquet floors and every kind of decorative treatment that does not afford absorbent surfaces or dust-collecting ridges, shelves or scrolls, may be freely employed in an entirely sanitary scheme of decoration.

In bath-rooms and closets do not have wooden enclosures to baths, sinks or w.c.'s, as such places frequently serve to harbour filth and thus become a nuisance. Let every part of the sanitary fittings be open and above board, so that any leakage can be detected and every part accessible for daily cleansing.

Corners behind w.c.'s and corners of rooms generally would be more hygienic if slightly rounded to prevent the collection of dirt.

The walls of bath-rooms, lavatories and the domestic offices should be covered with varnished paper, paint or, preferably, with ceramic or enamelled metal tiling, so as to be impervious and washable. The latter forms of wall covering are strongly to be advocated for larders, pantries and store cupboards. The floors of bath-rooms, water-closets and lavatories, also larders, should be cemented or asphalted.

Mosaic of marble or glass is a material more often employed for the flooring of halls, steps and lavatories in this country than for mural decorations, due chiefly to questions of cost, but

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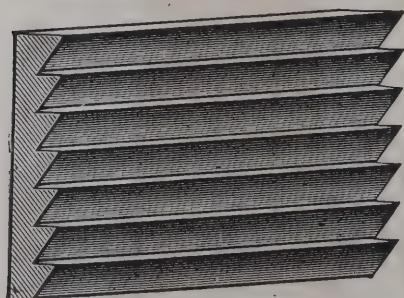
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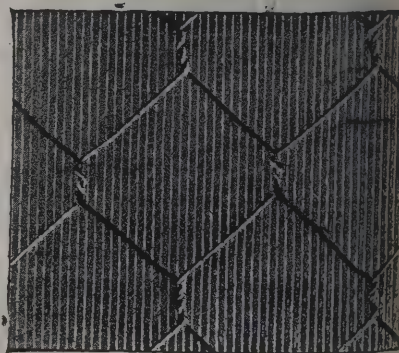
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In conclusion, a word may be given to the necessity for ample inlet and outlet ventilation for every room, to promote the health of the occupants and to preserve the decorative ornaments. The least injurious form of artificial lighting in all respects is, of course, the incandescent electric lamp, and where gas is used every burner should have outlet ventilation to carry off the fumes.

Carefully search for cupboards under stairs, also cellars or vaults. See that all such places have cement floors. Lime-wash them twice a year, and do not let lumber and dirt accumulate. Abolish brick or wood dustbins, and have iron portable bins.

Bear in mind that soap and water, fresh air, sunlight and cleanliness in general are as much to do with health as elaborate drainage and the complications of modern plumbing, and there is the advantage, moreover, that such simple things are within the reach of all—the poor as well as the rich.

This rough sketch of a few points in the sanitary decoration and management of houses, while necessarily superficial, will have served its purpose if it provides material for discussion.

### RED LEAD AND LINSEED OIL.

A SPECIAL event has led me to consider, says Monsieur Vaillant in *L'Architecture*, the reasons which in former days led to the use of red lead, and lately of colcothar (improperly called minium of iron) for protecting iron from rusting. This protection of the metal from the effects of damp and acids has always been a subject of great interest for builders, but for all that I have found no trace of works showing any sign of that interest, and builders appear to me to have been content with the old traditions of the utility of red lead.

Our colleagues in the North of France think that it is unnecessary to paint iron which is shut up in masonry and sheltered from the weather, but others think that it cannot be regarded as being protected from damp even under those circumstances, and that it should therefore be always painted with red lead.

There is no process which gives complete security from the weather to ironwork exposed in the open air. If they are oil painted, the painting has to be renewed and renewed until all details are smothered. Enamel scales off. Browning only acts as a very temporary preservative. Horn used hot with oil

is still the best, but I have been unable to obtain any information about this singular process.

It is said that red lead and linseed oil form, in marked contrast to colcothar, asphalt or coal tar, a composition which adheres very tightly to iron and has no action on it. The red-lead coat does not crack in drying or after drying. It does not blister or flake off. When the painting has to be renewed it is not necessary to remove the old colour, and the other applications have to be scraped off, so that the new coat of asphalt, &c., can be put on a clean metallic surface.

The qualities essential for a protective coating for iron are impermeability, adherence and elasticity. It must respond without rupture to the expansion and contraction of the surface which it covers. The red-lead coating being a bad conductor of heat lessens these variations, so less call is made than would otherwise be the case on its elasticity.

Red lead is applied to ships' bottoms in the following manner:—The iron is first made clean with hydrochloric acid and the vigorous use of rotary wire brushes. It is then rinsed with water and rubbed dry. It is then painted with the red lead and oil, which is first made into a thick viscid paste, which will keep several days without hardening. Just before use this paste is thinned with oil till it can be conveniently applied with the brush. Twenty-two gallons of colour contain one cwt. of linseed oil and 400 lbs. of red lead, and will cover 120 square yards for the first coat and 144 for the second.

The proper preparation of the surface to be protected is of the first importance, while the other essential is that the composition should be good. Now builders pay attention to neither of these points. They clean the iron perfunctorily, or, which is just as useful, they don't clean it at all, and they paint it with inferior qualities of red lead, often adulterated with ochre or even with brickdust. Such alteration will remain undissolved if the suspected pigment is boiled in a solution of sugar acidulated with nitric acid, which dissolves minium rapidly.

Iron forged at an engineer's and brought to a building is left about in all sorts of weathers, and as above stated is imperfectly cleaned or not cleaned at all, and then painted with inferior red lead. Besides, careless work leaves joints insufficiently protected by the paint, and as soon as rust gets hold in a joint the work is as good as ruined, as much ironwork on outdoor carpentry testifies.

Although it must have been evident from the beginning of the use of iron its tendency to rust was its great drawback, no

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success seems to have been achieved in its protection until the revival of oil-painting by Van Eyck, and the discovery that linseed oil had the power of drying in the air and covering surfaces with an impermeable coating. At a time when every painter prepared his own colours and made all manner of experiments, it was quite natural that the increased drying power conferred on linseed oil should have been found out. No doubt the early attempts to prevent iron from rusting were confined to greasing it, and once the effect of lead on linseed oil had been observed it was not a great step to paint iron with red lead and oil. But so far as I know no systematic attempts have ever been made to establish clearly the conditions of painting iron with red lead and oil to compare its results with those of the anti-rust methods. Cloez did something towards it when he showed that the drying of oil was due to absorption of oxygen, and the influence of light, heat and extent of surface on that absorption. There is very little oxidation of an oil by the air in the dark, and less with coloured light than with daylight, and less at low than at high temperatures. The special capacity of linseed oil in painting has thus been defined, but it is very doubtful whether that can be said of the bodies which are mixed with it, and which seem merely to give opacity and consistency.

It is unfortunate that the great difference in price among oils and the great difficulties in the way of recognising them when mixed together are the cause of much adulteration. Chemists have long been trying to find out means of satisfactorily analysing mixtures of oils, and it cannot yet be said that they have been entirely successful. The difficulty lies in the close similarity between the composition of different oils, and in the fact that tests which give a sharp reaction with a pure oil do not do so in mixtures containing it.

Hence the exaggerated demand for special siccatives. Some there are of these which can be of service when used with prudence and with reference to some particular object to be attained, but unless used in very small quantities they lessen the adhesion of the paint, and create a tendency in it to scale off, by making it less elastic and hence less conformable to the effects of changes of temperature upon the metal.

Insufficient cleaning of the surfaces to be painted, and the use of other applications than red lead and linseed oil are probably between them responsible for most of the failures experienced in iron painting. However that may be, there can be no doubt that red lead and linseed form a very suitable composition for protecting iron. Recent researches tend to show

that an actual compound of linseed oil and a minium, a so of lead-soap resembling india-rubber, is formed. These researches also controvert a curious objection which has been made to painting iron with red lead. It has been said that the painted iron suffers by reason of a galvanic action being set up between the iron and the minium. It is singular that no one has ever advanced this objection to the painting of iron with white lead and linseed oil, an application which is exactly on all fours with the composition of red lead and linseed oil. Objectors to red lead and not to white lead also seem to have forgotten that the oil, especially when dry, is so bad a conductor the passage of any current seems absolutely impossible. At Bremen an iron coated with red lead eighteen years before was found to be absolutely insulated, so that it did not affect a galvanometer with tensions of 150 volts. In fact, the director of telegraphs at Hanover was led to suppose that even atmospheric tensions might be resisted by a mixture of red lead and linseed oil.

A paste of red lead and linseed oil is the only substance capable of closing hermetically joints subjected to great pressure from gases or water, and it is used in the manufacture of secondary batteries to protect metals from oxidation. The experiments of Hacketal have shown that a paste of linseed oil and red lead applied to vegetable fibre provides a solid insulating, weather-resisting envelope, capable of replacing gutta-percha for overhead wires. The resistance of the dry mass is more than 640,000 megohms per square inch. The tissue impregnated with linseed oil pasted with from four to five times its weight of red lead loses completely its hygroscopic properties and becomes an insulator equal to india-rubber. It is insensible to all kinds of weather.

Two threads of bronze, each one-twentieth of an inch in diameter, were exposed to chlorine gas for a month, one naked, the other painted with red lead and linseed oil. The latter was not in the least affected, and the other was eaten completely through.

The present agitation against the use of lead in any form, from its poisonous effects on the workmen using it, is taking a wrong form. The right course is not to prohibit the use of lead and its compounds, which have valuable properties probably impossible to secure with any substitutes, but to find out and adopt methods whereby they may be used without injuring the health of those who have to handle them. Such must exist, and up to the present very little attempt has been made to find them.

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# The Architect.

## THE WEEK.

WE have already chronicled the death of EMERICH STEINDL on the 31st ult. in his sixty-third year. He was the architect of the Parliament house in Buda Pesth, which will shortly be opened. In Hungary there was a movement among many enthusiastic artists for the creation of a national style, and the examples produced were more remarkable for novelty than for grace. STEINDL stood aloof, for he had been nurtured in the Classic traditions, and he preferred in Gothic the works of the purest period alone. He was largely employed in the restoration of Mediæval edifices, such as the beautiful cathedral of Kaschau, the Abbey of Jak, the castles of Vajda-Hungad and churches in Bartfeld and Kremnitz. The Emperor of GERMANY was especially pleased with STEINDL'S Houses of Parliament. While allowing the two chambers to be expressed, the architect suggested their unity by means of a great cupola.

THE export of works of art from Rome is steadily decreasing. The value of the paintings, statuary and miscellaneous works which left the city last year amounted to 83,946*l*. In 1898 such exports were 116,930*l*; in 1899 there was a reduction to 113,115*l*, and in 1900 to 103,483*l*. It will thus be seen that last year the value was not quite three-fourths of the total four years ago. According to the British Consul the falling off is probably due to two causes: the first is the strict enforcement of the rules bearing upon the transfer from the country of works of art, chiefly specimens of old art; and the second is the tendency on the part of the present generation to follow commercial pursuits as yielding more tangible and early profits than an artistic career. An influential cause arises from the more accurate knowledge of works of art which is prevalent among visitors to Rome. There was a time when there was no difficulty in passing off sham antiques on strangers, but people have now become more sceptical. The works of modern Roman artists are also less appreciated than formerly.

A PAPER on "The Lia Fail, or Stone of Destiny at Tara, and the Election of Kings by Augury," was read by Mr. SIDNEY HARTLAND at the meeting of the British Association. This is by some supposed to be the Coronation-stone in Westminster Abbey. Mr. HARTLAND said it had an authentic history of 600 years. At the time of the conquest of Scotland by EDWARD I. it was the stone on which the kings of the Scots were according to immemorial custom installed, and was then removed from Scone to Westminster Abbey. Its earlier history was abundantly supplied by legend. Regarded as sacred, it was even identified with the stone used by JACOB as a pillow. The attempt was thus made, by connecting the ruling race in Scotland with the legends of the Hebrew patriarchs, to confer upon the stone the united sanctity of religion, antiquity and patriotism. The history of the stone had been subjected by SKENE, and more recently by Mr. O'REILLY, to an exhaustive analysis, which rendered it clear that there was no trustworthy evidence that the Stone of Tara was the Coronation-stone now at Westminster. The antecedent improbability was great, and even if it were indisputable that the stone in question was no longer at Tara in the eleventh century, the chasm between that period and FERGUS, whose very existence was legendary, would still have to be bridged and the variants of the story would need to be reconciled.

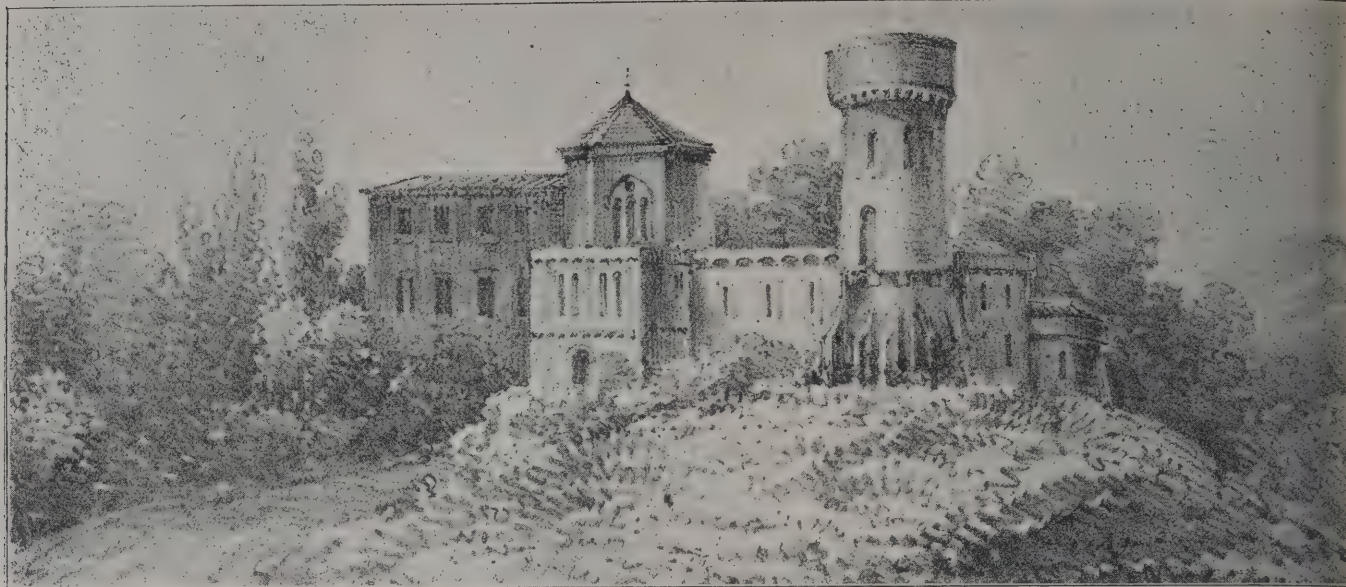
It is a popular belief that parsonage houses are as much the property of the parish as the church itself. Surprise and alarm were therefore excited by the announcement that the Vicarage House and 8½ acres of glebe land at Cowfold were about to be sold by public auction. A few years ago a similar attempt was made, but the then Bishop of CHICHESTER, at the request of the Commissioners, refused his consent. The present bishop with the patron of the living, the Bishop of LONDON, and the Archbishop of CANTERBURY gave their permission. A memorial was

accordingly sent to the prelates by the parishioners asking that the sale should be prevented. The explanation of the vicar was that it was impossible for a clergyman whose income was only 330*l*. a year, and who was not provided with a curate, to keep up a fine mansion with five acres of pleasure grounds, orchards and gardens. The vicar denied that the late bishop was opposed to the sale. The vicar also wished to erect a house that would be better adapted for a man with a limited income. But the parishioners consider that a cheap house built near the entrance gate will not only depreciate the value of the present vicarage, but will be so wanting in privacy that the living will be deprived of one of its great charms. The vicar's reply was that the new building will be erected under the rules of the Ecclesiastical Commissioners at a cost of 1,500*l*, and the plans will require the sanction of the three bishops. According to the solicitor of the vicar, the inhabitants of a parish have nothing whatever to do with the residence of an incumbent. It is not their property, never was their property, nor have they contributed in any shape or form one single farthing to its erection. In days gone by pious persons built churches and parsonages on their own land, dedicated them to pious uses, and endowed them with land, tithes, &c. They thus became the property of the Church, and each of the holders of the benefices thus created became the freeholder of the church, parsonage house, glebe lands, &c., during his incumbency. The parsonage house provided a roof over his head, and the glebe lands and other emoluments provided for the necessities of his maintenance and that of his family. Of late years the old parsonage houses, many of which had become dilapidated or were far too small for the requirements of modern times, were rebuilt under the auspices of Queen ANNE'S Bounty, which lends money under certain enabling statutes to incumbents for the purpose of rebuilding their parsonage houses. In spite of the opposition the sale took place on Monday last, the freehold of the vicarage, with stabling, finely timbered gardens and grounds, ornamental water stocked with fish, and a piece of meadow land of about 8 acres 2 roods 36 poles being sold for 4,000*l*.

THE executive committee of the Carnegie Trust propose to expend 200,000*l*. among the four universities of Scotland within the next five years. The money will be available for improvements in teaching and for new buildings. A sum of 40,000*l*. will be allotted to Glasgow for buildings which will be utilised for the departments of physics, physiology, forensic medicine and materia medica. To Aberdeen University 5,000*l*. will be allotted, mainly for laboratories. A similar sum is to be given to St. Andrews University. With contributions from other individuals the funds available for building purposes at St. Andrews reach a sum of over 40,000*l*. It is hoped to provide better accommodation in Edinburgh University for the classes of natural philosophy and engineering. The Trust will contribute 40,000*l*. towards the expense on the understanding that the plan is approved. A charter has been granted under the Royal Sign Manual for the incorporation of the Carnegie Trust.

IT was said by HEINRICH HEINE that in listening to CHOPIN'S compositions he forgot the performer, and thought only of the great tone-poet whose place was with MOZART, BEETHOVEN or ROSSINI. CHOPIN made himself so much at home in Paris, he might with reason be looked upon as a Frenchman. But the French no longer care about him or his romantic career. A few years ago some of his surviving admirers resolved to erect a memorial of him, and a site was assigned in the Parc Monceau, Paris. That would be an appropriate position for a celebrity who was once much appreciated by the fashionable world. Then there was a change in the official mind, and the Luxembourg Garden was substituted. It was also decided to allow no more than a bust, accompanied by a single figure. Vandalism has, unhappily, made its appearance in Paris, where the simplest work of art used to be respected, and the emblematic figure has already suffered mutilation. The sculptor, M. GEORGES DUBOIS, is afraid of a renewal of the attempts, and he therefore proposes that the figure should be cast in bronze. The expense would not reach 100*l*.





PAINTERS' ARCHITECTURE: CLAUDE.

### SCULPTORS AND PAINTERS.

IT is impossible to prevent men from exercising their self-esteem, and consequently the society, profession or calling to which some belong is extolled beyond those in which they have no part or interest. In that way the purpose of nature is served and there is progress. Even in the serene atmosphere of the British Association we find the same spirit existing. Rarely are philosophers allowed to imitate BACON in taking all knowledge for their province. They have to make their choice. The public also copy the specialists. Some sections are crowded, whilst in others the readers of papers have only a few men like themselves as listeners, and indeed in occasional cases the papers have to be taken as read.

The pursuers of science are, however, only imitating the conduct of painters and sculptors in the palmy days of the Renaissance. One of the subjects which was most fiercely disputed, and very often with swords and daggers as arguments, was the relative importance of the man who worked in marble, bronze or precious metals and the man who covered canvases with colours. It is recorded of GIORGIONE that he upheld the supremacy of his own art by insisting that a spectator without changing his point of view could see a painted figure under several aspects and even with different movements. That was a commonplace theory which might be convincing to people who had only a vague notion of art and wished to have its principles reduced to a few words. But when GIORGIONE was asked to give a demonstration of his assertion he went through one of those curious experiments which were frequent at the time, but which would not now convince children who had perused a few pages of a scientific primer. VASARI relates how GIORGIONE painted a man whose back was visible in the picture. Before him was introduced very clear water, which displayed the front part of the figure. On one side was a polished cuirass, and on the other a mirror, and the reflections were supposed to reveal the remainder of the body. The biographer tells us that the work received unlimited applause on account of its ingenuity, and it was accepted as establishing the superiority of painting over sculpture in having the power to combine in one view a great many aspects.

The sculptors, on the other hand, claimed their own superiority because it was necessary to be thorough in their work. They were not able to evade a contest with difficulties by means of shadows, foreshortening, perspective tricks, &c. Their statues were to be seen from many points of view, and were equal to sustain the test of touching. Even in reliefs it was sometimes expected that the figures were to be made so salient as almost to suggest they could be detached from the ground.

When it was a question whether painting or sculpture was most eligible for the decoration of a building, we can

well imagine that arguments of many kinds, and not always cogent, were forthcoming from the representatives of the two arts. The painters were willing to adorn the exterior of structures with frescoes regardless of atmospheric operations, while the sculptors believed the interiors to be adapted for statues and reliefs. In our time a competition of the sort is almost an impossibility. Buildings rarely are allowed to afford opportunities to painters or sculptors for the exercise of their arts. But it is noteworthy that in 1780, when the Royal Academy was still in a state of infancy—it was only ten years old—REYNOLDS felt it was his duty to discriminate between the principles of painting and sculpture and to demonstrate that sculpture has but one style, while there were several in painting. "The sculptor's art," said the President, "is not unlike that of dancing, where the attention of the spectator is principally engaged by the attitude and action of the performer, and it is there he must look for whatever expression that art is capable of exhibiting." REYNOLDS was not a scholar, but it is a remarkable fact that PLUTARCH made a nearly similar observation, the difference being that he refers to poetry instead of sculpture. SIMONIDES had said, and his words helped to inspire the *Laocoon* of LESSING, that painting was dumb or silent poetry, for in the old days poetry was more often listened to in the form of recitation than read. PLUTARCH, on the contrary, held it would be truer to say that dancing was mute poetry, and poetry a speaking dance, inasmuch as painting never employed the aid of poetry, or poetry that of painting, whilst dancing and poetry have a complete affinity. Painting, sculpture and dancing were consequently brought into relation. It would, however, be well to remember that dancing was a very different art with the Greeks to that which was popular in London during the eighteenth century. THACKERAY in one of his essays introduces REYNOLDS and GOLDSMITH at Madame CORNELYS', the former wearing a domino. REYNOLDS stated that dancers can wear masks with little diminution in expression, and he expressed a belief that in antiquity masks were also common. Hence he drew the conclusion that as the face bears so very inconsiderable a proportion to the effect of the whole figure, the ancient sculptors neglected to animate the features with the general expression of the passions. It was with the face rather than with the figure that REYNOLDS was successful, and thus his own practice was judged by him to represent exactly the province of painting and at the same time to define the limits between painting and sculpture. If it were pointed out to him that his figures did not suggest a study of the model or of ancient masterpieces in sculpture, he would have been able to reply that the figures of TITIAN and of RUBENS were attractive although they were not perfect in their proportions.

The Venetian and Flemish painters offered compensa-



tion for inaccuracies by the vivid power of their colours. A sculptor has no resource of that sort; if his contours are excessive or attenuated he must accept the consequences. No friendly apologists extol the glowing flesh or the richness of his costumes. He is treated as if he were a boy at school whose inaccuracies in arithmetic, grammar or geography are followed by punishment. There is no middle course for the sculptor; he must attain the standard which is accepted as the right one or his work will fail. It is also his misfortune, a circumstance ignored by the public, that with him the correction of faults is attended with such difficulties as to be almost an impossibility. A painter can change or modify his work to any extent that seems desirable, but there is not a process corresponding to painting out in marble. The clay model can certainly be altered, but an error in marble may be of a kind beyond remedy. In fact, an attempt at correction is not infrequently found to create a defect of a worse character.

When all this is called to mind it becomes an excuse for the utilisation of mechanical aids in sculpture. With a full-size model which is as complete and perfect as the artist can make it, an exact reproduction, which can be performed by assistants, not only diminishes risks costly to the sculptor and which he can ill-afford, but it may produce the most pleasing result. The cause of some of the disappointment which now arises on viewing works by JOHN FLAXMAN was his employment during the greater part of his career of models which were far smaller in size than the figures in marble. Dexterous as he was as an operator, he was not always capable of realising his original idea. Italian practice did not depend much on large models, and the sculptors were trained from entering the ateliers to carve the stone. But the number of unfinished works by MICHEL ANGELO will suggest that his powerful arm could not always make the marble express his thoughts.

The want of appreciation of the sculptor's art in England arises in a large measure from the difficulty which the public in general have in judging it rightly. They have become tolerably familiar with painting, and they have a notion that the dividing line between painting and sculpture is not so wide as theorists assert. Hence it is that sculptured tricks when displayed in foreign exhibitions, and which make the judicious grieve, are usually attractive for English visitors. In one sense it is true, as was remarked by Sir DAVID WILKIE, that in ancient art qualities exist of freedom of handling and light and shadow which become suggestive of great paintings. WILKIE accounted for this by saying that in the time of the Greeks statues and bas-reliefs were painted or produced in parti-coloured marble, while the pictures resembled coloured sculptures. But some modern efforts to combine the qualities of the two arts are pushed to extremes which would daunt a Greek. No one can properly judge sculpture who is not possessed of a canon of proportion more definite than that commonly employed in the judging of pictures. Indeed in assessing the value of pictures proportions are hardly recognised, or the defects are condoned by qualities which are more pleasing to the crowd.

The difficulty of criticism as applied to sculpture is of old standing. VITRUVIUS considered that the fluting of columns was no more than an attempt to imitate the drapery of the figures of women as represented in sculpture. It is only necessary to give a glance at the procession of the Athenian maidens which we see in the British Museum in order to realise how inadequate was the suggestion. We need not say anything about the want of artistic imagination which is imputed to the old architects, and their inability to produce effects of light and shade and variety of surface by channelling their columns. What is also suggested is that there was monotony in the folds of the garments; but it will be found that while there is a resemblance in the costume, for no doubt the Athenian girls who formed the procession were uniformly clad, yet we can see sufficient variety to confute the statement of VITRUVIUS.

Efforts are occasionally made of late to overcome an English peculiarity of long standing, and to have the grace which sculpture confers imparted to English buildings. But that end will not be attained if the works which are sought after do not possess the characteristics of genuine sculpture. Public bodies and private building-owners, as well as those who pass by and utter critical opinions with

the assurance of ignorance, must not allow themselves to be led away by a weakness for painting. Each art has its limits, and neither will be helped if the qualities are mixed and confounded. VASARI in his time endeavoured in the introduction to the "Lives" to persuade his countrymen that the old contest as to whether sculpture or painting was entitled to first place was labour in vain. A similar appeal is still more needed to-day in England. Sculpture cannot succeed if an untaught public opinion decides that the sculptor must do his best to make his work resemble the works of the painter, and possess those qualities which the material he uses is unfitted to express.

## THE EDUCATION OF CONSTRUCTORS.

THE importance assigned to education and to new subjects of study at the meeting of the British Association in Belfast must strike many of the old members with amazement. When BREWSTER projected the Association his desire was to have annual assemblies in which students of science could reveal their discoveries and obtain the applause they merited. The humblest explorer of nature in that way found an opportunity to exhibit the results of his investigations in the by-paths of science and to receive encouragement from those who were recognised as masters. At the early meetings of the Association many instances were forthcoming of men without renown who had succeeded in the ascertaining of facts relating to one kind of plants or rocks which hitherto were unknown or doubtful. They represented mainly sciences which were dependent on observation, and they were able to continue in the pursuit of their studies by the aid of small grants from the general fund. There were other men who were engaged in experimental science, and from time to time they imparted the results of long, costly and toilsome inquiries. That was only one side of the Association's utility. What was reckoned by many as more important was the facility which the meetings offered of bringing men together who lived in seclusion or far apart, and who could compare notes about the work in which they were engaged and give encouragement to one another. There could be no public record of what took place at conversations in which, perhaps, not more than two might join. But they may have been more productive of good than the open meetings of the Association.

As time went on the province of the Association was enlarged by the addition of new sections. It became necessary to play, as it were, to the public, and in that way the intercourse between devotees of the same pursuit was weakened. Many other changes have occurred, and it would now appear from what was said in Belfast as if prominent members were looking forward to a day when a different class of followers of science would take part in the proceedings.

Events have recently made this imperative. Although the British Association has accomplished so much it is evident that the progress of science has more advanced in countries where a similar itinerant institution is unknown. To a great extent the meetings gradually were taken to be occasions for pleasant excursions, and a week with the Association was judged by many to be the most interesting part of a holiday. Hence science was easily associated with pastimes, and men and women enjoyed themselves with playing with tremendous problems which, however vast in their conclusions, did not need much labour in obtaining information. JOHN TYNDALL spoke at a former meeting in Belfast about the scientific use of the imagination, but that power was long exercised by people who had never attended a lecture at the Royal Institution or read through a book on science. It was very agreeable to discuss problems in geology or evolution which could do without the support of evidence, but that mode of pursuing science was not adapted for business purposes in this world. A few years ago a German chemist apologised before the Association for the imperfections of the paper he was about to read, and which was on green dyes. He said it represented the work of only thirty years, and that time was insufficient to exhaust so important a subject. His words were no doubt regarded as mere affectation, but they suggested the thoroughness of German chemists, which has made them



supreme in chemical manufactures. Toying with science is not more in favour in Germany than toying with war. There is no difference in the grim earnestness with which both are followed.

We need not consider what was said about the necessity of a new mode of education and inquiry in the majority of the sections at Belfast. Anthropology has of late years pushed geology aside as the favourite science of amateurs. Yet we find the President speaking of the lamentable lack of precise information and of the generalisations resting on foundations which are so slight as to afford little chance of permanence. But the address to the engineering section by Professor JOHN PERRY should not be overlooked in the briefest review of the proceedings. Every man who is successful naturally thinks his own methods of education are the best. Professor PERRY served four years as an apprentice in a Belfast foundry, and he is therefore justified in concluding that manual work should be taken up at a very early stage by whoever aspires to become an engineer. In 1863 there was, he says, only one school in the North of Ireland, where practical geometry and mechanical drawing were taught. He also attended Queen's College, Belfast, for a course of civil engineering, and he supposes that never on earth was there a college so ill-equipped for such a study. The only apparatus consisted of a few surveying instruments. But he had for master JAMES THOMSON, the elder brother of Lord KELVIN, who was a great mathematician, and on that account he was not duly esteemed by the civil engineers of those days, or by railway companies, and we doubt if a structure from his design exists in Ireland. He was also a close observer of phenomena, and was therefore indisposed to accept the calculations which were then respected as infallible :—

One of his early lectures, says Professor Perry, was about flowing water, and he told us of a lot of things he had observed, which I also had observed without much thought, and he showed how these simple observations completely destroyed the value of everything printed in every text-book on the subject of water flowing over gauge notches, even in the otherwise very perfect Rankine. I felt how stupid I had been in not having drawn these conclusions myself, but in truth till then I had never ventured for a moment to criticise anything in a book. I have been a cautious critic of all statements in text-books ever since. Again, soon afterwards, he let me see that although I had often looked at the whirlpool in a basin of water when the central bottom hole is open, and although I had read Edgar Allan Poe's mythical description of the Maelstrom, I had been very much too careless in my observation. Among other things, Thomson had observed that particles of sand gradually passed along the bottom towards the hole. When he found out the cause of this it led him at once to several discoveries of great importance. Indeed, the study of this simple observation gave rise to all his work on (1) What occurs at bends of pipes and channels, and why rivers in alluvial plains bend more and more; (2) The explanation of the curious phenomena that accompany great forest fires; (3) The complete theory of the great wind circulation of the earth, published in its final form as the Bakerian Lecture of the Royal Society in 1892.

JAMES THOMSON revived Mediæval days, when professors influenced a large number of students with little external aid, for ability can dispense with costly apparatus of most kinds. But Professor PERRY was then sufficiently competent to take advantage of what he heard. He believes that with such a teacher boys from public schools like those who now join engineering classes would be handicapped, and they would gain more by entering works at once than by entering a great engineering school. "Our school system," he affirms, "resembles the ordinary type of old-established works, where gradual accretion has produced a higgledy-piggledy set of shops which one looks at with stupefaction, for it is impossible to get business done in them well and promptly, and yet it seems impossible to start a reform anywhere. What is wanted is an earthquake or a fire—a good fire—to destroy the whole works and enable the business to be reconstructed on a consistent and simple plan. And for much the same reason our whole public school system ought to be 'scrapped'."

The principle which was adopted by Professor PERRY with his colleagues, Professors AYRTON and ARMSTRONG, at the Finsbury Technical College, was that the teacher should take the pupil's point of view rather than the pupil the

teacher's, and that the student should be instructed how to teach himself rather than be taught by them. Their students are now to be found everywhere in good posts. Boys were instructed to make drawings in pencil only, also tracings and blue prints such as would be respected in the workshop, and not the drawing-class drawings which are respected nowhere. The spirit of the system was suggested by the rejection of a 100-ton testing machine, for it was thought preferable to improvise means of testing by an old screw-jack or a lifting machine, or by loading wires and twisting things. Four directors of electric companies entered into the spirit of the institution, and for many weeks occupied themselves advantageously in conducting experiments made with an old fly-wheel bought at a rag-and-bone shop.

It would seem as if Mr. SQUEERS had hit upon the sort of teaching which is best adapted for those who have to construct railways, machines or buildings. The pupil of Dotheboys Hall first went through an orthographical exercise by spelling "winder," and then was sent to clean one. Language and practice were thus combined. The majority of teachers until recent times were like pupils who knew only of "winders" from the spelling-book, and to this day a great many learned professors would be unable to describe the anatomy of one of the windows in their study. The knowledge required in practice is not of the kind that will be produced by definitions alone. Many pupils in architects and engineers' offices become quickly disgusted when they realise that words have meanings which are unknown to them, and which only can be discovered by an examination of the objects which are referred to. The national *mauvais honte* deters them from asking explanations, and they continue to go through routine in a manner that is unsatisfactory to themselves if they are honest, but which they have not the courage to remove. One sometimes thinks that in such cases it would be an advantage if words were not used until clear ideas of things were obtained by means of the senses. Every subject ought to be taught, Professor PERRY declares, "through illustrations from the professional work in which a student is to be engaged. An engineer has been wasting his time if he is able to answer the questions of an ordinary examination paper in chemistry or pure mathematics. The usual mathematical teacher thinks most of those very parts of mathematics which to an ordinary man who wants to use mathematics are quite valueless, and those parts which would be altogether useful and easy enough to understand he never reaches; and so it is also in chemistry. An engineer teaching mathematics would avoid all futilities; he would base his reasoning on that experimental knowledge already possessed by a student. He would know that the finished engineer cannot hope to remember anything except a few general principles, but that he ought to be able to apply these, clumsily or not, to the solution of any problem whatsoever."

It must have been startling for those who are conversant with the history of the British Association to hear those revolutionary methods announced. All branches of science are supposed to be represented in the sections, and anyone who is accepted as a genuine student should be able to take part in each of them without trouble. But Admirable CRICHTONS, however useful in conversation, do not aid in the practical work of the world. To master any one subject properly, if it were only green dyes, requires the devotion of a lifetime. With concentration and a good method a zealous student can, however, render himself capable of becoming useful to his generation. Nor is it necessary for him to conduct elaborate experiments or to employ costly testing machinery if he can fully understand that nature is uniform, and that small things rarely differ from those which are large. Sir JOHN HERSCHEL was of opinion that a lover of science could discover much in a common soap-bubble, and would be usefully employed in endeavouring to produce them on a large scale. What is true of the bubble is applicable to much else in science. But the experiments must have another object than the gaining of a little reputation by talking about them.

Two Bursaries and three demi-bursaries will be competed for on the 27th inst. at the Paris School of Electricity.



## THE EDUCATION OF THE ENGINEER.\*

Not only do I think that every teacher in an engineering college ought to have some acquaintance with engineering, but it seems to me equally important to allow a professor of engineering, who ought, above all things, to be a practical engineer, to keep in touch with his profession. A man who is competing with other engineers in practical work very quickly becomes antiquated in his knowledge; the designing work in his drawing office is altogether out of date; he lectures about old difficulties which are troubles no longer; his pupils have no enthusiasm in their work because it is merely academic lifeless; even when he is a man distinguished for important work in the past his students have that kind of disrespect for teaching which makes it useless to them. If there is fear that too much well-paid professional work will prevent efficiency in teaching there is no great difficulty in applying a remedy. One most important fact to be borne in mind is that efficient teachers cannot be obtained at such poor salaries as are now given. An efficient labourer is worthy of his hire; an inefficient labourer is not worthy of any hire, however small. Again, there is a necessity for three times as many teachers as are usually provided in England. The average man is in future to be really educated. This means very much more personal attention, and from thoughtful teachers. Is England prepared to face the problem of technical education in the only way which can lead to success, prepared to pay a proper price for real articles? If not she must be prepared to see the average man remaining uneducated.

Advocacy of teaching of the kind that was given at Finsbury has met by the opposition not only of pure mathematicians and academic teachers, but I am sorry to say also of engineers. The average engineer not merely looks askance at, he is really opposed to, the college training of engineers, and I think, on the whole, that he has much justification for his views. University degrees in engineering science are often conferred on students who follow an academic course, in which they know little except how to pass examinations. The graduate of university, even, does not often possess the three powers to which I have referred. He is not fond of reading, and therefore he has no imagination, and the idea of an engineer without imagination is as absurd as Teufelsdröck's notion of a cast-iron man. He cannot really compute, in spite of all his mathematics, and he is absurdly innocent of the methods of the true engineering of nature. This kind of labelled scientific engineer is now manufactured in bulk because there is a money value attached to a degree. He is not an engineer in any sense of the word, and does not care for engineering, but he sometimes gets employment in technical colleges. He is said to be a good teacher when he is really only impressing upon deluded pupils the importance of formulæ, and that whatever is printed in a book must be true. The real young engineer, caught in this net, will no doubt find his way out of it, for the healthy influence of the workshop will bring back his common sense. The average pupil of such graduates there is no help. If he enters works, he knows but little more than if he had gone straight from school. He is still without the three qualifications which are absolutely necessary for a young engineer. He is certain to be a nuisance in the works and to try another profession at the end of his pupilage. But if it is his father's wish he can make a show of knowing something about it, and he is usually called an engineer.

Standardisation in an industry usually means easier and better manufacture, and a certain amount of it may be good even in engineering; but when we see a great deal of it we know that in that industry the true engineer is disliked. Consider that in the scholastic industry there has been far too much standardisation. Gymnasium and polytechnic systems have been standardised in Germany, and there is a tendency to import them into England; but in my opinion we are very far indeed from knowing any system which deserves to be standardised, the worst we can copy is what we find now in Germany and Switzerland. What we must strive for is the discovery of a system suiting the British boy and man. The English boy may be called stupid so often that he actually believes himself to be stupid; but of one thing we may be sure, I find in some way or other an escape from the stupefying effect of schoolwork to which the German boy submits. And if it is possible to make the average English boy of nineteen such a silly school-leaving examination as the German would be little employment among common sense engineers for such a manufactured article. But is it possible that British boys could be manufactured into such academic machines, without initiative or invention or originality, by teachers who are none of them engineers? We must have a British system of education. We cannot do much longer as we have done in the past without engineering education, and, furthermore, it must be such as to

from the address of Professor John Perry, president of the Engineering Section of the British Association meeting at Belfast.

commend itself to employers. Of my Finsbury students I think I may say that not one failed to get into works on a two or three years' engagement, receiving some very small wage from the beginning and without paying a premium. To obtain such employment was obviously one test of fitness to be an engineer, because experienced men thought it impossible. One test of the system was the greater ease with which new men obtained employment in shops which had already taken some of our students. It is certainly very difficult to convince an employer that a college man will not be a nuisance in the shops. In Germany and France, and to a less extent in America, there is among employers a belief in the value of technical education. In England there is still complete unbelief. I have known the subscribers of money to a large technical college in England (the members of its governing board) to laugh, all of them, at the idea that the college could be of any possible benefit to the industries of the town. They subscribed because just then there was a craze for technical education due to a recent panic. They were ignorant masters of works (sons of the men who had created the works), ignorant administrators of the college affairs and ignorant critics of their mismanaged college. I feel sure that if the true meaning of technical education were understood, it would commend itself to Englishmen. Technical education is an education in the scientific and artistic principles which govern the ordinary operations in any industry. It is neither a science, nor an art, nor the teaching of a handicraft. It is that without which a master is an unskilled master; a foreman an unskilled foreman; a workman an unskilled workman; and a clerk or farmer an unskilled clerk or farmer. The cry for technical education is simply a protest against the existence of unskilled labour of all kinds.

To have any good general system the employers must co-operate. Much of the training is workshop practice, and it cannot be too often said that this is not to be given in any college. The workshop in a college serves a quite different purpose. Now, how may the practice best be given? I must say that I like the Finsbury plan very much indeed, but there are others. When I attended this college in winter I was allowed to work in the Lagan Foundry in summer. In Japan the advanced students did the same thing; they had their winter courses at the college, and the summer was spent in the large Government workshops; the system worked very well indeed. In Germany recently the great unions of manufacturers made facilities for giving a year of real factory work to the polytechnic students, but it seems to me that these men are much too old for entrance to works, and besides, a year is too short a time if the finished product is to call itself a real engineer. Possibly the British solution may be quite different from any of these. A boy may enter works at fourteen on leaving a primary school, or not later than sixteen on leaving a secondary school. In either case he must have the three powers to which I have already referred so often. It will be recognised as the duty of the owners of works to provide, either in one large works or near several works, in a well-equipped school following the Finsbury principle, all that training in the principles underlying the trade or profession which is necessary for the engineer.

No right-thinking engineer has been scared by the newspaper writers who tell us of our loss of supremacy in manufacture, but I think that every engineer sees the necessity for reform in many of our ways, and especially in this of education. People talk of the good done to our workmen's ideas by the strike of two years ago; it is to be hoped that the employers' ideas were also expanded by their having been forced to travel and to see that their shops were quite out of date. In fact, we have all got to see that there is far too much unskilled labour among workmen and foremen and managers, and especially in owners. There may be some kinds of manufacture so standardised that everything goes like a wound-up clock, and no thought is needed anywhere; but certainly it is not in any branch of engineering. Many engineering things may be standardised, but not the engineer himself. Millions of money may build up trusts, but they will be wasted if the unskilled labour of mere clerks is expected to take the place of the thoughtful skilled labour of owners and managers. I go further, and say that no perfection in labour-saving tools will enable you to do without the skilled, educated, thoughtful, honest, faithful workman with brains. I laugh at the idea that any country has better workmen than ours, and I consider the education of our workmen to be the corner-stone of prosperity in all engineering manufacture. It is from him in countless ways that all hints leading to great inventions come. New countries like America and Germany have their chance just now; they are starting, without having to "scrap" any old machinery or old ideas, with the latest machinery and the latest ideas. For them also the time will come when their machines will be getting out-of-date and the cost of "scrapping" will loom large in their eyes. In the meantime they have taught us lessons, and this greatest of all lessons—that unless we look ahead with much judgment, unless we take



reasonable precautions, unless we pay some regard to the fact that the cleverest people in several nations are hungry for our trade and jealous of our supremacy, we may for a time lose a little of that supremacy. In the last twenty-three years I have written a good deal about the harm done to England by the general dislike that there is among all classes for any kind of education. I do not say that this dislike is greater than it used to be in England; I complain that it is about as great. But I have never spoken of the decadence of England. It is only that we have been too confident that those manufactures and that commerce and that skill in engineering, for which Napoleon sneered at us, would remain with us for ever. Many writers have long been pointing out the consequences of neglecting education; prophesying those very losses of trade, that very failure of engineers to keep their houses in order, which now alarms all newspaper writers. Panics are ridiculous, but there is nothing ridiculous in showing that we can take a hint. We have had a very strong hint given us that we cannot for ever go on with absolutely no education in the scientific principles which underlie all engineering. There is another important thing to remember. Should foreigners get the notion that we are decaying we shall no longer have our industries kept up by an influx of clever Utilanders, and we are much too much in the habit of forgetting what we owe to foreigners, Fleming and German, Hollander, Huguenot and Hebrew, for the development of our natural resources. Think of how much we sometimes owe to one foreigner like the late Sir William Siemens.

But I am going too far; there is, after all, not so very much of the foolishness of Ishbosheth among us, and I cannot help but feel hopeful as I think lovingly of what British engineers have done in the past. We who meet here have lived through the pioneering time of mechanical and electrical and various other kinds of engineering. Our days and nights have been delightful because we have had the feeling that we also were helping in the creation of a quite new thing never before known. It may be that our successors will have a better time, will see a more rapid development of some other applications of science. Who knows? In every laboratory of the world men are discovering more and more of nature's secrets. The laboratory experiment of to-day gives rise to the engineering achievement of to-morrow. But I do say that, however great may be the growth of engineering, there can never be a time in the future history of the world, as there has never before been a time, when men will have more satisfaction in the growth of their profession than engineers have had during the reign of Queen Victoria.

And now I want to call your attention to a new phenomenon. Over and over again has attention been called to the fact that the engineer has created what is called "modern civilisation," has given luxuries of all kinds to the poorest people, has provided engines to do all the slave labour of the world, has given leisure and freedom from drudgery, and chances of refinement and high thought and high emotion to thousands instead of units. But it is doing things more striking still. Probably the most important of all things is that the yoke of superstitions of all kinds on the souls of men should be lifted. The study of natural science is alone able to do this, but education through natural science for the great mass of the people, even for the select few called the distinguished men of the country, has been quite impossible till recently. I say that it is to engineers that the world owes the possibility of this new study becoming general. In our country nearly all discoveries come from below. The leaders of science, the inventors, receive from a thousand obscure sources the germs of their great discoveries and inventions. When every unit of the population is familiar with scientific ideas our leaders will not only be more numerous, but they will be individually greater. And it is we, and not the schoolmasters, who are familiarising the people with a better knowledge of nature. When men can hardly take a step without seeing steam-engines and electro-motors and telegraphs and telephones and steamships, with drainage and water works, with railways and electric tramways and motor-cars; when every shop-window is filled with the products of engineering enterprise, it is getting rather difficult for people to have any belief in evil spirits and witchcraft.

All the heart-breaking preaching of enthusiasts in education would produce very little effect upon an old society like that of England if it were not for the engineer. He has produced peace. He is turning the brown desert lands of the earth into green pastures. He is producing that intense competition among nations which compels education. If England has always been the last to begin reform, she has always been the most thorough and steadfast of the nations on any reform when once she has started on it. Education, pedagogy, is a progressive science; and who am I that I should say that the system of education advocated by me is that which will be found best for England? In school education of the average boy or man England has as yet had practically no experience, for she has given no real thought to it. Yet when she does, I feel that although the Finsbury scheme for engineers may need

great improvement, it contains the germ of that system which must be adopted by a race which has always learnt through trial and error, which has been led less by abstract principles or abstract methods of reasoning than any race known in history.

## THE ECONOMICS OF MUNICIPAL HOUSING\*

AS great cities grow, it becomes convenient that the centres should be devoted to offices, warehouses, shops, and that people who work in these places, and still more their families, should live in the outskirts. I do not know that anyone has denied this. Certainly the great majority are willing to admit it. At one time it is believed that a quarter of a million people lived in the square mile comprised within the City of London; no one supposes that would be convenient now. There is no reason to suppose that further change in the same direction will not be desirable in the future. Yet, incredible as it will appear to future generations, public opinion, the House of Commons, the London County Council, and some town councils think, or at any rate act as if they thought, that the process has now gone far enough and ought to be stopped, as if the state of things reached about the year 1891 was too permanent, to last for ever and ever. Private owners are indeed still allowed to pull down dwelling-houses and erect shops and offices, but they are abused for doing so and their liberty is at least threatened. But if a new railway or a new street is made—in all probability with the intention of increasing the accessibility of the centre from the suburbs—if even a new London Board school is built, and houses inhabited by persons who have less than a certain income are pulled down in any of these processes, it is required by law or Parliamentary resolution that other houses for these people must be built in the neighbourhood. So it comes about that there are in quarters of London most unsuitable for the purpose enormous and repulsive barracks dwellings, the sites of which are devoted in *secula seculorum* to the housing of the working classes; while the immense cost of devoting them to this instead of to their proper purposes is debited to the cost of improving the facilities for locomotion or to education, and is defrayed principally by the rates on London property, which chiefly consists of houses, and to some extent by the higher charges on the railways consequent on the restriction of facilities for extension. Fifty pounds a head is the average loss involved to the rates of London on every man, woman and child for whom these dwellings are provided. Such is the wisdom of practical men uninformed by instruction in economic theory. This palpable absurdity could never have been perpetrated if the general working of the economic organisation had been understood. In that case it would have been seen at once that the extrusion of over 200,000 inhabitants from the City of London in the past, which is admitted to have been desirable, was effected by the quiet operation of the law of value. It would have been seen that as it became desirable to turn the City to other purposes, the ground in the City became too valuable to use as bedrooms and as living-rooms for mothers and children, and this increase of value drove up the 200,000 inhabitants.

It would have been seen that the change had not come to an end, and no responsible body would have dreamt of putting themselves in opposition to it by buying sites and writing them down to 2 per cent. of their actual value in order that they might be tied up for ever and ever to the homes of a certain number of persons with less than a certain income. If such an unusually dense individual who had failed after many attempts to pass his examination in economic theory had proposed a policy which has been adopted, he would have been asked 70 questions—first, "What peculiar sanctity is there about the position occupied in the closing years of the nineteenth century? Why should this be stereotyped for all time? Why should not the position at the end of the seventeenth century have been maintained? Why should we not endeavour to restore the working-classes to their old home in the City, and remove the Bank of England to Tooting?" Secondly, "Will you imagine you will benefit by the policy you propose?" It is difficult to conceive of any answer to the first question. To the second the reply of the dunce would, of course, be that he thought the policy proposed would benefit the people housed on these expensive sites. This answer would at once be condemned as unsatisfactory. To build houses on land worth 100,000%, and let them to the first-comers of respectable antecedents at rents which would pay if the land were worth 2,000%, would be a very stupid sort of almsgiving if these respectable first-comers actually got the difference between the interest on the 100,000% and the 2,000%. But no one supposes that the

\* From the presidential address by Edwin Cannan, M.A., LL.D., to the Section of Economic Science and Statistics of the meeting of the British Association at Belfast.



et this difference or any considerable part of it. The difference is almost entirely pure loss to the community.

The chief immediate effects of the policy are, first, to retain the centre the men, women and children who inhabit the wellings; secondly, to retain other workers who perform various offices for these inhabitants; and, thirdly, to insure a supply of labour for factories which would otherwise (to the advantage of every one concerned) be driven into the country by the pressure of the high wages necessary to bring workmen to the centre, or to pay their house-rent if they lived there. So much for the utility of economic theory in preventing obstruction of desirable changes. My second claim on its behalf is that it serves to hinder the adoption of specious but illusory projects. This, I think, may be illustrated by examples closely connected with those which we have already considered.

The people who are most anxious to obstruct changes in the channels of trade which are coming about of themselves cause they are profitable, are often extremely anxious to promote changes which will not come about of themselves cause they are not profitable. For this end one of their most favourite devices at present is a State or municipal subsidy to promotion or transport between particular points. So we have "subsidies, free grants to light railways, the construction of unprofitable telegraph lines by the Post Office, and advocacy, at any rate, of the construction of unprofitable railways by municipalities. The practical man, uninstructed in economic theory, feels uneasy about such projects because he does not see where he is to stop, and he feels obscurely that universal subsidisation would mean ruin. But he does not see why he should not go a little way, and he goes sufficiently far to involve a loss quite worth considering.

A knowledge of economic theory would come to his assistance showing him that, as a rule, the most profitable enterprises are those which it is most desirable to undertake first, and that subsidisation of the less profitable does not create new enterprises, but merely changes the order from the more to the less desirable.

Then, too, we find people who are not quite so stupid as to think the working classes should always remain in the places where they were at the end of the nineteenth century, alleging that the way to cure overcrowding is for the local authorities to enter the building trade in a general way, and build houses inside or outside their districts, wherever it seems most convenient. To the mind uninstructed in economic theory it seems obvious that the larger amount of housing there is the more overcrowding there will be, and that the more housing the local authorities provide the more housing there will be. Economic theory, with its explanation of the general working of the organisation of production, suggests two objections. First, an addition to the housing in any locality will not be actual in diminishing overcrowding, in so far as it attracts inhabitants to the spot; a policy which assumes that the comparative plentifulness of houses is not a factor in the determination of the enormous and perpetual migration of people from place to place, which is indicated in the tables of marriages and births and deaths in the census, is doomed to failure. Secondly, economic theory suggests the reflection that the mere fact of a local authority building some houses will cause the whole number to be greater, if for every house built by the local authority one less is built by private enterprise, and that this is very likely to happen. Houses have been built by private enterprise in the past, and in these houses is the whole population is at present housed.

I have seen an enthusiast for municipal housing stand in the empty streets of a town late at night, when every soul in the town was evidently housed, and say, in a tone of conviction, "Private enterprise has failed." In that town four thousand houses had been built by municipal enterprise and more than ten thousand by private enterprise, and private enterprise was adding hundreds every year, while the housing committee of the corporation was meeting once a year to re-elect a chairman. Is it likely that private enterprise will build as much when it is competed with or supplemented by—the term does not matter—municipal enterprise? Why should it? If the municipality turned baker, would the private bakers continue to bake as much bread? Is not the attempt to stop overcrowding by inducing local authorities to build houses exactly the same thing, and just as absurd as it would be to attempt to stop under-feeding by opening municipal butchers' and bakers' shops?

In the long run, I admit, experience teaches. Protection has been alien once in this country, and I have little doubt that it will fall again if it becomes considerable. The policy of obstructing the removal of dwellings from the centre of a city already excites opposition in the London County Council, though unanimity still reigns in those last homes of the "old superstitions, the Houses of Parliament. Chancellors of the Exchequer and finance committees may be trusted to offer a stout resistance, on what they call financial grounds, to the really great development of the system of subsidies. There is even that the municipal building policy may be checked

by the laborious inquiries which show by statistics what everyone knows, that the poor are ill-fed and ill-clothed as well as ill-housed, and therefore lead people to consider how the poor may be made more able to pay for houses, among other things, instead of simply how houses may be built in the absence of an effective demand for them. But I claim that in matters such as these a more widespread appreciation of economic theory, and the quickened intelligence which that would produce would save us much painful experience, many expensive experiments and an enormous mass of tedious investigation.

## THE PALACE OF KNOSSOS.

A REPORT was presented to the British Association by Mr. Arthur Evans on his continued excavations of the prehistoric Palace of Knossos, in Crete. He explained that the work had been arduous and costly beyond expectation, but the discoveries had not fallen short in importance of those of the preceding years. The greater part of the palace, embracing an area of about 5 acres, had now been uncovered. Important new rooms had been disclosed adjoining the halls and "grand staircase" excavated in 1900, and it had been possible to preserve a great part of the upper storey throughout the whole region. A very interesting feature was the complete system of drainage, including latrines with flush pipes, and a succession of stone shafts descending from the upper floors to a network of stone ducts beneath the pavement of the lower rooms, large enough for a man to make his way along them. A highly interesting discovery in this part of the building was a shrine belonging in its existing state to the late Mycenaean period, with the cult objects and idols in place. A painted clay figure of a goddess, cylindrical below, bore a dove on her head. The central cult objects seemed to have been double axes rising between two pairs of sacred horns wrought in stucco. Each of the latter showed the socket for the handles of the cult object between the horns. A small double axe of steatite lay against one pair of horns. Fresh fresco paintings were discovered, including one of a lady in a very modern jacket, dolphins and other fish, and naturalistic foliage and lilies. Fragments previously found and now put together gave exciting scenes from the bull ring, in which girls as well as male tereadors took part. Very beautiful ivory statuettes also seemed to represent similar figures in high action. Further large deposits of tablets inscribed with the linear prehistoric script came to light, mostly referring to the Royal inventories and accounts, and concerning the armour, granary and other departments, many of them dealing in percentages. Clay cups were also found with ink inscriptions, a new departure in the prehistoric script. The exquisite ivory figures of youths showed "the art of Dædalos" in its highest perfection, displaying naturalistic details not found again in such work till the age of the Italian Renaissance. Another extremely interesting find was the remains of a large mosaic of porcelain plaques, many of them representing houses, so that a whole street of "the city of Minos" as it existed about 1500 B.C. could now be reproduced. Here, too, were strangely modern features—houses of three storeys, some semi-detached, and showing windows with four or six panes, oiled parchment having perhaps been used in place of glass. The whole seemed to have formed part of a large design showing scenes of peace and war analogous to those of Achilles's shield. The palace was found to climb down the eastern slope of the hill to a point about 90 metres below the northern entrance, the lowermost terrace having been supported by a quadruple line of wall. On the slope underneath the later Mycenaean palace had been found extensive remains of the magazines of what seemed to have been an earlier royal dwelling going back into the third millennium B.C. In these had been found beautiful painted vases, many of them of eggshell-like fabric, and some embossed in imitation of metalwork. The high civilisation of the kings of Knossos was thus carried back to about 2500 B.C. Below this, again, fresh explorations had been made of the deep Neolithic stratum underlying the whole site, which were productive of a fresh harvest of stone implements, pottery and primitive images of clay, marble and shell, perhaps the tridacna, and pointing to a prehistoric intercourse with the Indian Ocean. Fragments of vases of "Liparite," a form of volcanic glass unknown to the Aegean, from the first palace, pointed to almost as old a connection on the Italian side. The excavation of the south-eastern corner of the palace had still to be completed, and certain work of delimitation had to be carried out in other directions. The lower strata of the palace had also to be explored at several points, and continued researches into the Neolithic deposit were also desirable, as well as the examination of some neighbouring buildings and a renewed search for fossils. Unfortunately, the total amount that the Cretan Exploration Fund (including the grant from the British Association) had been able to contribute towards the year's expenses had again fallen far short of what Mr. Evans had been called upon to expend.



## NOTES AND COMMENTS.

WE have already mentioned the death on the 23rd ult. of Mr. CHARLES POLAND, after a long and painful illness. He retired some years ago, after a very successful practice as a quantity surveyor, in favour of his son, who continues it. Mr. POLAND's *clientèle* comprised several of the railway companies, the Metropolitan Asylums Board, the magistrates for the counties of Middlesex and Surrey, and many prominent architects both in London and the provinces. Among these was the late Mr. G. E. STREET, who at one time gave him the preparation of all his "quantities," as well as the large "measurements" of Bristol and Dublin cathedrals. This connection probably led to his being appointed on the Government side to prepare the quantities for the new Royal Courts of Justice in the Strand, which he did in association with the firm acting for the contractors. In his early days Mr. POLAND was a student of the Royal Academy and London University College, gaining medals and honours in the architectural branch of his profession and having some of his designs hung in the Academy.

A GREAT many people are incapable of realising that the creation of a town requires a large outlay in preliminary expenses. They are willing to admit that with ordinary business a start cannot be made without risking capital. But towns are supposed to come into existence without expense, or that all the burden will be borne by the earliest inhabitants. The opposition which has been raised to the drainage of Selsey exemplifies the peculiar feeling. A glance at a map of the South Coast will show that Selsey beach is the most southern point. Beachy Head does not extend so far. It has been necessary to lay down a line of tramway between Selsey and Chichester. With proper management the town ought to become an important addition to the various watering-places. But practically there is no systematic drainage, for cesspits and cesspools are common. It is now proposed to expend 10,000*l.* on a sewerage system according to plans by Mr. J. W. L. BARRETT. At first sight the expenditure may seem to be excessive, for the assessable value of Selsey is 5,504*l.*, and the inhabitants will be compelled to pay a rate of from 2*s.* 6*d.* to 2*s.* 9*d.* in the pound. But without a proper drainage system there is no chance for a village to develop into a successful town, and especially when the profits are to be derived mainly from visitors.

SEVEN or eight years ago it was resolved to carry out the restoration of the Madeleine, but as the work will be costly, and as the building is now a church instead of a Temple of Glory as originally contemplated, the authorities have some reason for the delay. The fate of the Campanile at Venice has, however, caused alarm in Paris, and it has been determined to make a show of commencing operations. It is believed that sufficient data have not been obtained from which to compute an exact estimate of the cost. It has therefore been decided to expend about 40,000 frs. on the erection of a scaffold, which will enable every part of the building to be examined. The structure will be movable, in order that along the four sides of the building the slightest defect in any of the details can be observed. The design for the present building was the work of VIGNON, and was adopted because it pleased NAPOLEON beyond any of its rivals. But a few years before the revolutions two sets of designs for a church on the site were prepared, one by CONSTANT D'IVRY and the second by COUTURE. The work which is about to be restored was completed sixty years ago.

MANY architectural drawings have a better right to be entitled works of art than drawings of a different class which are prized. It is, however, remarkable how rarely a drawing which can be assumed to have an architectural purpose has monetary value. They are of no account in sale-rooms or with dealers. What is more striking is that, however well drawn and coloured, they cannot be employed like other views. An architect who would hang his drawings in a room to which visitors were admitted would acquire a reputation for "shoppiness." It is only in a room which is supposed to be an office that they may be placed on the walls. In spite of this drawback, much ability continues to be spent on the preparation of drawings

and in imparting to them pictorial qualities. The number which are sent to the Royal Academy, most of which only a minority can be admitted, testifies to the desire of delineating a new building under a form which can be generally appreciated. The new edition of Mr. PHENÉ SPIERS'S "Architectural Drawing" (CASSELL & CO., LTD.) is evidence that there is no expectation of a change in the manner of producing drawings. Reproductions of pictorial drawings in colour and pen and ink are given as well as elaborate representations of details. An examiner under the Board of Education lately complained about the careless way of making working drawings. A study of such examples as those by Mr. WATERHOUSE and Mr. PLUMBE in the book should be sufficient to convince students that drawings cannot be too exact. Specimens are shown which are worth acceptance as models for all the varieties of drawings which are likely to be required in an architect's office in out-of-doors study. The new edition contains additional plates and information. It is superfluous to praise a treatise which has already deservedly obtained commendation.

THE Brown Book of the Architectural Association for the session 1902-03 has been issued. The annual general meeting will be held on October 3, when Mr. H. T. HARRIS will deliver his address and the prizes will be distributed. At the fortnightly meetings papers will be read on "Houses and Architecture" (T. R. SPENCE), "Roof Coverings" (F. C. EDEN), "Some Notes on Sanatoria for Consumptives" (CECIL C. BREWER), "Architectural Practice, Real and Ideal" (J. S. GIBSON, A.R.I.B.A.), "The Study and Delineation of Old Buildings" (W. H. BIDLAKE, A.R.I.B.A.), "A Few Thoughts on the Attitude of the Young Architect towards the Crafts" (J. DUDLEY FORSYTH), "What is the Real Value of Greek Work to the Modern Artist?" (Professor G. BALDWIN BROWN, M.A.), "The Aesthetic Treatment of Modern Bridges" (H. H. STATHAM, F.R.I.B.A.), "Competitions" (H. B. CRESWELL and A. W. S. CRESS, F.R.I.B.A.), "Ancient and Modern Town Houses" (HENRY WHITE, A.R.I.B.A.), "Palladio," illustrated by lantern views (BANISTER F. FLETCHER, A.R.I.B.A.), "Architecture and the Public" (A. NEEDHAM WILKINSON, A.R.I.B.A.). The day school will be opened on September 29, and the evening school on October 6.

## ILLUSTRATIONS.

LYDD'S BUILDING, FENCHURCH STREET, E.C. : PRIZE, 1ST FLOOR LANDING. BOARD-ROOM FIREPLACE.

CATHEDRAL SERIES.—HEREFORD: THE RETRO-CHOIR. IN SOUTH-EAST TRANSEPT.

RESIDENCE, BARNT GREEN, WORCESTERSHIRE.

THE residence, Barnt Green, Worcestershire, is now being built, but it is intended to be constructed with 1½-inch Leicester bricks, the roofs to be tiled with Welsh shingle. There are to be the following rooms:—Dining-room, drawing-room, small study, larder, pantry, kitchen and scullery, lavatory and large entrance hall; first floor—two bedrooms, bath-room and lavatory, and two attics. It is estimated to cost 2,250*l.*, including small stable and coach-house for two horses, with small motor-house at side. The woodwork outside to be stained with creosote, the wood being left rough. Mr. E. STANLEY MITTON is the architect.

GORING CHURCH TOWER, OXON.

HOUSE AT SOUTHEND.

THIS drawing represents a residence which has recently been erected, with some modifications, by Mr. J. W. WATSON, of Southend. It occupies a good position, and has a side view of the sea. The contractors were Messrs. WHUR & CAMPKIN, of Southend, and the contract price was 984*l.* 16*s.*

PRINTERS' PREMISES AT CROYDON.

THIS is a reproduction of the drawing in this year's Royal Academy, and represents the new portion of Messrs. ANDRESS & CO.'S premises. At present the alterations have only been partly carried out. The materials are red-brick and Bath stone dressings. Messrs. WM. SMITH & SON, of 202 London Road, Croydon, are the contractors.



## HISTORIC WESTMINSTER.

THE fifty-ninth annual congress of the British Archaeological Association was opened at Westminster on Monday. The members met at Caxton Hall (the old Westminster Town Hall) in the afternoon, when the mayor of Westminster, Lieutenant-Colonel Clifford Probyn, president, formally declared the congress open. St. Margaret's Church and Holland House, Kensington, were visited.

The President delivered an address, in which he said that more appropriate place than Westminster could not be found for the congress of the British Archaeological Association. Westminster was more ancient than the City of London, according to Sir Walter Besant, for Thorney or Bramble and—the former name of Westminster—was an important trading centre long before Londinium grew out of the marshes. Mayor of Westminster he was bound to regard with approbation the increasing attention paid to the study of ancient memorials of a national character rather than to the exclusive admiration of the more remote remains of the Romans and the Greeks. At one time nothing that was not "classical" was deemed worthy of the attention of the antiquary. But the Association, being so emphatically the British Archaeological Association, had taught us that archaeological research, like charity, best began at home, rewarding us with richer and more informing results, involving a more devout veneration for those who had gone before us, who it better than they knew, and inspiring a more knowledgeable pride and affection for our native land. He marked with the warmest approval that particular object of the Association—the preservation, as far as was possible, consistently with the operative requirements of the living, of our ancient monuments. Old houses and historic alleys must, for example, never old and picturesque, give way to improvements such as those now being conducted in the Strand, with which he had great deal to do in his official capacity, but much could be done to preserve from wanton destruction or ignorant neglect the works of ancient times that still existed everywhere throughout this England of ours. He would be wanting in appreciation if he did not mention the work of the London County Council in this respect. He desired to see the powers of the Ancient Monuments Protection Acts conferred upon the Westminster City Council, so that the Council might be enabled to preserve such a monument as the old Roman bath on the Strand, that might perchance be any day swept away by the ruthless speculating builder, after having weathered the rigors of centuries. It should certainly be his business to press upon his Council their imperative duty to collect, catalogue and catalogue the invaluable monuments and records, many of them almost unknown to the antiquary, of the eleven centuries that constituted their city, to which students could have ready access. He considered that such a work would commend itself to that Association as worthy of the city, and their President he should feel it incumbent upon him to stress its importance upon his Council. The notorious Colonel Blood, whose attempt to rob the Tower of the Royal Crown had been immortalised by the author of the "Romance of London," was buried under the green turf of Christ Church, 1, Victoria Street, opposite Caxton Hall. Blood died, after fortnight's "distemper"—diagnosis in those days was not very precise—on August 24, 1680, and was decently interred five days after in the Broadway Churchyard, as it was then called.

## PRIMITIVE UNDERGROUND DWELLINGS.

At the Anthropological Section of the meeting of the British Association at Belfast three papers were read which related to ancient subterranean dwellings in the British Isles.

The first was by Mr. William J. Fennell on "Some Ulster souterrains." He remarked that the north-east corner of Ireland was peculiarly rich in evidences of prehistoric man. Though no houses of any kind were known to exist attributable to the Stone Age, there was another class of built structure—souterrain—which might be claimed as the primeval architecture of the country, for these souterrains existed in great numbers, and fresh ones were constantly coming to light. A souterrain might be defined as a subterranean place of refuge, in that sense only a dwelling. The entrance was either naturally difficult of approach or cunningly hid, and the interior was generally long, low, narrow and winding, and beset with frequent barriers, locally known as "difficulties," through which one person could pass at a time, and then only by creeping.

If these were the abodes of peace this succession of barriers would have no meaning, although one at the entrance might be useful. That they were not burial-places was evident, as no relics of early cremation or remains of human bones, or in fact of any kind, had been found in them. The souterrains were not burrows, but walled chambers connected by passages well defended by built of dry masonry walls and roofs, and afterwards

covered up by earth and eventually hidden by vegetation. The exterior covering was always very thin, so that in many cases they were close to the surface. The construction was invariably of rough unhewn stones from the neighbourhood, and the roof was invariably formed by the overlapping of one stone on another, a system followed in much more recent times. The barriers were formed of walls rising from the floor almost to the roof, then a space of 12 or more inches to the next wall, which descended from the ceiling to within 15 inches of the floor, and leading in some cases to a long, low tunnel 16 inches or 18 inches high, with a similar barrier at the other end. No two souterrains were alike in plan; some were straight, or almost so, with chambers branching off. Some were extremely short, while others were considerably over 100 feet long. The souterrain at Muckamore was a solitary example of a two-storey building, entered from the field level to the upper floor, and from that to the lower one. Mr. Fennell thought that it was impossible to assign a date to these rough, rude structures, but the diminutive one at Connor, county Antrim, had two ogham stones inserted, so that at least some of them must have been erected much later by a race who used an alphabet. It showed a distinct advance in building construction in the use of a series of lintel stones—including the ogham ones—to support the roof, but even in this case it seemed to have been simply a place of refuge.

The paper by Mr. George Clinch, F.G.S., described "Some Ancient Subterranean Chambers Recently Discovered at Waddon, near Croydon." He said that excavations for a sewer at Waddon House in June 1902 revealed three subterranean chambers cut in a bed of Thanet sand, and partly occupied by sand which had fallen or been washed into them. In each chamber, however, a compact floor was found at about 15 feet below ground. The chambers were of beehive shape, about 7 feet high and 12 feet or less in diameter. Each had its independent entrance opening on the south-south-east side, but no other means of access till the domed roofs were cut open by the sewer trench. Below the sand which covered the floors of the chambers several cores and chips of green-coated flints were found, with small fragments of imperfectly baked pottery and larger fragments of Romano-British pottery. The small dimensions and the form and plan of the Waddon chambers, the absence of a perpendicular shaft and their occurrence in sand differentiated them entirely from the so-called "deneholes;" nor had they any feature in common with the "flint mines" of Grimes's "Graves and Cissbury," nor with the beehive-shaped cavities found in the Isle of Purbeck in 1883. On the continent of Europe the most similar chambers were those at Pelmella in Portugal, which M. Cartailhac had ascribed to sepulchral purposes in the latter end of the Polished Stone Age. Similar chambers had been noted in Brittany and elsewhere. The subterranean "beehive tombs" at Mycenæ also were identical in plan, though different in dimensions and material. Bones of animals had been found in the loose sand in the Waddon chambers, but no human bones; nevertheless, the evidence seems to show that the chambers were primarily sepulchral. South-east and east of Waddon there were many hut circles which had been attributed to the Neolithic Age. They were circular in form, with marks of entrances on the east and south-east side, and exhibited general resemblance in dimensions and plan with the Waddon chambers. The Waddon discovery was therefore of some importance as evidence for the size, shape and plan of prehistoric dwellings; the vaulted roofs cut in hard sand reproducing in general form the interlaced boughs, benders and wickerwork of the ordinary surface hut, and the lateral passage the doorway of the neolithic dwelling. The same idea of interment within a house survived during the Bronze Age; but when cremation came into vogue a miniature copy of the Bronze Age house—the "hut urn"—was sufficient repository for the ashes. The tradition of the circular neolithic hut was carried on in the Celtic beehive dwellings of Cornwall, Wales, Scotland, Ireland and Gaul; and probably in the circular buildings of subsequent English architecture. The Bronze Age dwellings, on the other hand, which were reproduced in the "hut urns," might be regarded as the prototypes of the square or angular forms of ecclesiastical and domestic architecture.

Mr. David MacRitchie read a paper on "Underground Dwellings in the British Isles," in which he described certain primitive underground habitations as typical of a class of structures apparently existing at one time throughout the British Isles, though the greater part of the specimens now remaining were found in Ireland and Scotland. It was hardly possible to conceive of human dwellings more archaic in character, and yet some of them, if not all, belonged to the times that are quite historic. Two specimens, one at Crichton, in Mid-Lothian, and the other at Newstead, in Roxburghshire, must have been built after the arrival of the Romans in Britain—and probably a long time after that date—for the reason that a number of dressed stones with Roman orna-



mentation had been used in their construction, presumably taken from Roman ruins. That these underground structures were used as places of human abode was obvious, because they contained domestic utensils, such as hand-mills and personal ornaments, as well as the broken bones of animals used by man as food. In a few instances they had a fireplace, but this was very exceptional. Like the similar dwellings of the Eskimo, these underground habitations were so well protected from the cold of even the keenest winter that a fire was not necessary, and oil lamps sufficed for heating, lighting and cooking. From their characteristics therefore these underground structures quite justified the name of "earth-house," which was given to them in the Norse sagas, and also in living popular speech. In appearance they varied considerably, but most of them had their roofs about a foot or two below the surface of the ground, entrance being obtained from above by one or more downward-slanting passages. They were built of rough, undressed, unmortared stones, the walls gradually converging until they met in a "cyclopean" or "false" arch, completed by large flagstones laid across. In some cases their very small dimensions supported the traditional belief that they were built for a dwarfish race.

Professor Boyd Dawkins said the whole question of date, structure and use was one of very great difficulty, which was not diminished by the comparatively small areas of the distribution of these underground structures in the British Isles, those being the districts mentioned in the papers, and the Orkneys, the West of Scotland and Cornwall in the neighbourhood of Penzance. Their structure was not far removed from that of the souterrains of the Pict houses. He did not know of any evidence bearing on the date except that brought forward by Mr. MacRitchie. The date was certainly after the ogham time, which he thought Professor Rhys was right in dating from the time of the Roman occupation of Great Britain to the twelfth century. In respect to the Waddon chambers discovered by Mr. Clinch, as the evidence stood he looked upon them as ancient habitations and not as tombs.

Dr. Monro pointed out that the beehive structure, which did not exist in Scandinavia or France, necessitated building from within with weight above, either a mound or pressure of soil. The chief question was whether there was any evidence that the structures were pre-Roman. The answer seemed to him to be in the negative, and that the structures were not prior to the Iron Age but post-Roman and even Mediæval. He thought that there was no subject in British archaeology which required more care, attention and collection of evidence than that of the papers read that afternoon.

Mr. Coffey said there was no evidence in Ireland that souterrains went back to pre-Roman times. Very few objects had been found in them, but these few pointed to their existence between 600 and 1000 A.D. The ogham stones used showed that they were later than pre-Roman times. There were a number in Ireland around the forts erected in Danish times, and the reason for making them was that it was difficult to find a better system of defence than these souterrains. In respect of the pigmy question, he agreed with Professor Boyd Dawkins that the size of the structure had no direct relation to the size of the people, and it was necessary that they should be restricted in size to place difficulty in the way of the enemy. Many primitive peoples had small entrances to their dwellings by which they had to creep in, though they were full grown themselves. If the structures were within the historical period of the Roman occupation it would be very difficult to maintain the theory of their occupation by pigmies.

The president (Dr. Haddon) said he had visited a few of these structures, and the evidence seemed to him to point to a post-Roman date; and, further, that no traces of a pigmy race had been discovered as existing at that time.

Mr. Fennell, in replying, said he still held that they were places of refuge, and that the ogham stones and Roman pottery found was no evidence of age, the ogham stones having been probably plundered and worked in at a later date.

Mr. MacRitchie also replied in a few words.

### SANATORIA FOR CONSUMPTIVES.\*

AT the invitation of the Council of the Sanitary Institute I have undertaken to-day to address you on the subject of sanatoria for what is called the open-air treatment of persons suffering from consumption. The subject is one of much practical interest to all, and primarily to those who are charged with the duty of safeguarding the public health. It will of course be understood that I am in no way dealing with the medical side of the question, but solely with the question of providing hygienic buildings specially designed to give medical men every opportunity of practising their curative and preventive art. In this Congress and at this time, one can hardly

\* A paper by Mr. Edwin T. Hall, F.R.I.B.A., read at the Congress of the Sanitary Institute at Manchester.

pass to the consideration of our subject without first expressing our joy and gratitude to the Most High for the restorative health of His Majesty the King, who has lent the weight of great authority and energy to press on all our consideration the study of means by which the great scourge of tuberculosis may be removed from suffering humanity.

Now, a sanatorium is not only a place where patients are lodged to undergo a medical "cure," but it is a school where they are taught how to live so as to attain and preserve health; a school where the principles of hygiene are systematically regularly taught from day to day. Its educational advantages are among the greatest benefits conferred, and each inmate sent forth as a missionary to disseminate his knowledge to his family and friends. Were there nothing else, the value of this to the community would alone justify the erection of such buildings all over the country and their equipment with a staff of able and devoted medical experts as teachers, but what is added is the fact that the patients or scholars are in all cases relieved, and in a large percentage of cases cured of a distressing malady, they are themselves object-lessons enforcing the doctrines they preach.

It need hardly be said that a sanatorium should itself be a model of a hygienic abode, and only those who are intimately acquainted with the subject know with what minute study of the smallest detail this end can alone be attained.

There are three important factors for consideration in connection with every project for a sanatorium. These are (1) the site, which involves the questions of subsoil, altitude, shelter, prospect and aspect; (2) water supply; and (3) sewage disposal.

First as to site. A sandy or gravel subsoil should be selected if attainable, so that rain may be readily absorbed. Stiff clay is impervious, and a site with clay not far from the surface gets waterlogged. Evaporation creates ground mists or fogs, which are very bad for consumptives. But a well-lying site on sand or gravel is as bad, because the subsoil water percolates through the subsoil and renders the earth moist and cold. This percolation also forces outwards ground air, air charged with carbonic acid gas. The ideal site is the southern slope of a hill, sheltered from north and east winds by trees. On sandy soil the trees will generally be some species of pine, the resinous exudation from which is health-giving, imparting a clean and brisk flavour to the air.

It is sometimes held that the near presence of sheets of water is objectionable, but that, I think, only applies to stagnant waters. A rapid river may be beneficial owing to the change of air to which its movements give rise. Witness the case of Nordrach in the Black Forest, where the Hammerbach, coming from the higher lands, passes through the village, close to some of the buildings of Dr. Walther's colony; or again, Harlaching, near Munich, standing on a hill above the torrential Eiser.

There are in our beautiful country scores of sites where the life and movement of such waters have a bracing and energising influence on every person, whether sound or sick.

Given, then, a suitable site amid trees, the next thing is to place the sanatorium in an elevated position. It is not good to put it on a flat plain. Shut in by woods, with a strictly limited prospect, the influence on a patient is bad. There is a sense of confinement most depressing to all nervous temperaments. Hohenhonerf, not far from Cologne, is high up on a mountain, with beautiful and very extensive views of the Rhine. Nürnberg-Engelthal, in Bavaria, commands a wide stretch of scenery. From Falkenstein, in the Taunus mountains at Cronberg, near Frankfurt, the panorama is only limited by the power of sight. Dr. Walther's sanatorium at Crookesbury Ridges, in Surrey, has in a less elevated position also extensive views. The Brompton Hospital sanatorium at Frimley, in Surrey, is on a high site above the Bury Road, to the south of which stretches Frimley Common.

Again, there should be a wide clearing on the south side of the building and in a less degree on the other sides. Admit of building and to gardens plenty of sunlight. The curative value of sunlight, with its germ-destroying power, is immeasurable. The clearing, too, gives the sense of freedom and expansiveness. The charm of the seaside is largely the gratification of this sense. On the north and north-east sides get all the shelter that trees afford from the cold winds.

Another point of great value is to set the building well away from a high road, and in a sandy district this is of especial importance. Dust of any kind is, of course, very bad for affections of the throat or respiratory organs, and the dust from a high road, laden as it is liable to be with faecal matter and carried about by high winds, is worse than all.

Of course, a good water supply is essential. Where a public service is not at hand, a spring should be available on the higher side of the sanatorium. It will there not be in danger of contamination from sewage, and the water will flow by gravitation to the building—a great saving in expense of maintenance.

Sewage purification and disposal are important matters. In small institutions earth closets are satisfactory in every way.



the limited quantity of liquid refuse, such as bath and sink water, can easily be dealt with; but in larger sanatoria some form of underground sewage disposal becomes a practical necessity. Where there is a public sewer at hand there seems to be no objection to its use. As, however, a good sewer for a sanatorium is generally far from all public sewers, the other method of disposal of sewage must be considered, and it may be of interest to lay before you information regarding what is done in various places in South Germany and at Nuremberg.

As found in South Germany both in sanatoria and general hospitals it was the common practice to treat the sewage with a suspension of sulphur earth, a natural product, of which, I have seen, there are considerable deposits near Cologne. The treatment was a very simple process. At Falkenstein the mixture was contained in a closed vessel placed in the outlet chamber of a divided sewage receiving tank. The inlet chamber received the sewage, from which, by a screen or tray, paper, was separated. This chamber, at a certain level, emptied itself by a syphon. To the top of this syphon a small pipe in the mixture vessel was attached, and as the sewage passed it drew a charge of the mixture by suction. The effluent was then conveyed from the second chamber to another receiving tank at a distance divided into two chambers, and ultimately into four settling tanks, used in rotation, and after resting there a period ranging from two to four weeks, the liquid was discharged on to the land. There was no smell whatever, the extreme simplicity of the installation was commendable. At the Nuremberg General Hospital, which is quite new, a more elaborate apparatus is used. The main drains discharge into a cesspool or receiver, with an outlet trough at the level of the inlet pipe. This trough discharges on to a species of water-wheel contained in the central of three open brick tanks. The two side tanks contain the sulphur earth mixture, kept in constant motion by agitation to prevent precipitation. The rotation of the wheel is arrested as the bucket comes into position under the trough and is filling. While the filling is going on two small streams of the sulphur earth mixture flow in from the side tanks. The treated sewage then passes over a weir to a settling tank, with an iron screen over it to catch foreign substances, and thence to two large circular settling-tanks, intended to be used alternately, with funnel-shaped bottoms about 7 metres in diameter in the centre. Suction pipes are fixed to near the bottom of these tanks, and the heavier deposit is pumped up to a hydraulic press, when the sewage is formed into cakes to be used away for manure. The liquid from the tanks passes

at Harlaching, after similar treatment with sulphur earth, the sewage passes into the rapid Eiser; and I am told all the sewage of Munich passes into the river without ill effects, though, I suppose, to the tremendous current. At Nordrach the sewage goes into an ordinary closed cesspool. When the cesspool is emptied by means of a portable closed-tank apparatus, probably known to many officers of health and sanitary engineers. I did not hear of any case in South Germany where a septic tank treatment was adopted. In the sanatorium at Wokingham, in Surrey, there is a septic tank with two or three settling-tanks attached, and from these the effluent passes on to the land. Having dealt with these general features, there is one point of danger to the disease which demands a few words. The danger from consumption appears to arise from bacilli contained in sputum. When the moisture evaporates these bacilli are blown about and become a source of danger. In all sanatoria provision should be made for dealing with sputum by ventilation. At Nordrach each bedroom is fitted with a pair of wooden basins—one for washing, the other for spitting. It seems to me the waste pipes of the latter must become contaminated, and in any case I do not like the idea of sputum being blown into a pipe.

Passing from the consideration of site, water-supply and sewage disposal, we now turn our attention to the buildings to be erected. First, what should be the size of the institution? Ask for a county or large town a public sanatorium of about 100 patients will be found to be best and most economical for the minister. It may be objected that this is too large for a district, but it seems to me that when once the usefulness and advantage of these institutions are demonstrated and appreciated by the general public and by life insurance companies, this standard size will be found to be none too large to demand on it.

Assuming the size to be determined, we have to settle what should be the bases of the design, and these, I think, may be set forth:—(1) Let the whole be conceived on broad lines, and to suggest expansiveness—plenty of room to breathe and move; (2) plenty of sunlight and fresh air into and through the patients' rooms; (3) disconnection of all buildings containing w.c.'s and other sanitary appliances; (4) separation of patients into groups for classification of patients; (5) limitations of destructive fires and provision of means of escape; (6) air accommodation for those temporarily unable to walk;

(7) limitation of height of buildings; (8) housing the medical and nursing staff away from their daily work; (9) separation of administrative buildings from the hospital proper; (10) avoidance of all angles, ledges and crevices for the harbouring of dust.

There is one all-important detail to be settled at the outset before putting pencil to paper, and that is, shall patients be accommodated with single or multi-bedded rooms? On this question there is difference of opinion. By some it is held that for the poor rooms with more than one bed are best, as these patients like company.

There are cases where two or three beds in a room may be of advantage, as where hæmorrhage is likely to occur, when one patient may temporarily help another pending the arrival of the doctor or nurse. But the majority of doctors hold that patients who have separate bedrooms do the best as they are not disturbed by others, and the King's advisory committee have adopted this principle for the new sanatorium about to be erected by His Majesty.

From the consideration of this subject we are led to another, viz the external reclining balconies or Liegehallen, as they are called in Germany. In these are placed couches where the patient may lie in the open air all day, and perhaps all night. Dr. Walther, of Nordrach, does not adopt them, as he thinks they tend to make patients lazy, but they are very generally adopted, and in certain stages of the disease are doubtless of great value. Every inducement should in every case be given to make patients get out into the open air as much as possible, the bedroom being only used at night. Moderate exercise, as the patient improves, is recommended by all medical experts, and it is not uncommon to find patients doing their ten, twelve and fifteen miles walk a day after they have been some time in a well-organised sanatorium.

If the foregoing general principles be borne in mind it will be easier to appreciate the relative merits of the different buildings which I now propose to describe to you, and to illustrate by the drawings hanging on the surrounding walls, which I have prepared after visiting and studying all the buildings.

It will be noted that all the sanatoria submitted to your notice differ radically in planning. Unless otherwise mentioned, all the German institutions have double casement windows, are heated by low-pressure steam radiators with no fireplaces, and are electrically lighted.

In some of the latest institutions, as Harlaching and Krailing, the administrative buildings are separate and distinct from those containing patients, but not so in others, particularly in earlier ones. For example, at Falkenstein, which is the first institution I propose to describe, the kitchens, larders, &c., are in the basement of the block. It must, however, be borne in mind that this institution commenced in what had been a private house, and although by additions it is now a large place, the original house remains part of it. The staff, except the medical men, live in the block.

It will be seen by the general plan that there are detached blocks—engine and boiler-houses, stables for horses and cows, workshops, laundry, &c.

The main building, containing a basement and three floors above, one of which is in the roof, consists of a centre block facing east-south-east, with two symmetrical wings at a slightly obtuse angle, enclosing on three sides a terraced garden. To the east is a very large dining-hall open on the south-south-east to a wide verandah, which is continued in an easterly direction to the chief doctor's house, forming a covered promenade about sixty-five metres, or, say, 200 feet long. On the south side a long annexe, with an enclosed verandah or gallery facing east, leads to another doctor's house containing the consulting-rooms, &c. On the west side of the gallery are the gardener's house, mortuary, &c. The total frontage in a straight line measures about 1,000 feet. The sanatorium has accommodation for 120 patients of either sex, with seventy single and twenty-five double bedrooms, generally of a large cubic capacity. There are three main staircases.

The staff consists of a medical superintendent with three assistants and a managerial staff of four. The total staff, male and female, indoor and out, is ninety-two. There is one waiter to eight or ten patients. There is no regular staff of nurses, and no separate accommodation for them. They are only taken in if required by patients. There are only two slipper-baths for patients and a douche-room in the basement. The water-closets are contained in the building. The floors of bedrooms are covered with linoleum; the walls are plastered. There are no rounded angles. The Liegehallen are attached to the building, forming wide verandahs on the three sides of the terrace at the level of the basement floor, which is above ground on this side. In the grounds there are large open pavilions and smaller summer-houses containing couches, all fancifully and luxuriously appointed, and in the building are winter garden, reading, writing, billiard and music-rooms. Altogether this is a high-class hotel, medically conducted, where wealthy patients may live cheerful lives in beautiful air and glorious scenery.



Ruppertsheim, a few miles distant, near Königstein, is modern, is for poorer patients, and is more strictly a sanatorium. It is on plan a flat crescent three storeys in height, above a basement, with two short wings, and accommodates 122 patients, ninety male, thirty-two female. There are no separate administrative buildings, but the kitchen is in the west wing on the ground floor. There are eighteen rooms with one bed, seventeen with four beds and six with six beds, of a cubic capacity per patient for men of twenty to thirty metres, and for women of thirty to forty metres. The staff consists of the medical superintendent, with two assistants, a secretary and a lady superintendent or matron. There are three female and two male nurses, and twenty-four male and female servants. There are two main staircases from bottom to top. The patients' rooms face south and are in single file, with a corridor on the north side. There are nine slipper-baths for the patients and one douche for each sex, all in the body of the building. The floors of bedrooms are of plain uncovered deal boards; the walls and ceilings are of plaster. In the older portion of the building there are no concave angles to the rooms, but in that most recently built all angles are concave except at the floor, where they are most needed. At the ends of the building there are two-storeyed Liegehallen, about 12 feet wide.

One of the medical officers, who courteously showed me over the institution, was of opinion that wards with as many as six beds were not so good as those with only two or three. He thinks a few balconies to bedrooms, large enough to take beds, are desirable.

The Nürnberg Heilstätte, Engelthal, a few miles from Henferfeld, is a modern building—a parallelogram consisting of basement, three other floors and then rooms in the gables. There is no separate administrative block of buildings. It affords accommodation for fifty patients in seventeen rooms, two containing five beds, two with one bed, the others having three beds each. The cubic capacity per patient is forty metres. There is one staircase, which is not sufficient for so high a building with so many residents. All patients' rooms face south, and have a corridor on the north side. There is a medical superintendent, with no assistant. There are three female nurses and seven female servants. There are four slipper-baths and three douches, all in the body of the building. There are six water-closets for patients similarly placed. A handsome dining-room faces south, and is served from the kitchen in the basement. The floors are of uncovered deal boards. Walls and ceilings are of plaster and have concave angles, except at floor, which omission the doctor laments. The plastered surfaces are artistically decorated, a feature which I commend to the notice of our hospital authorities. The Liegehallen are quite detached, one being on the terrace at the south-west of the sanatorium, the other in the woods.

(To be concluded)

## PREHISTORIC REMAINS.

IN the Section of Anthropology of the British Association on Saturday some papers were read on prehistoric remains. The Hon John Abercromby read one on the oldest Bronze Age ceramic type in Britain: its close analogies on the Rhine, and its probable origin in Central Europe. He said that the oldest type of pottery in Britain was the "drinking-cup," for which he proposed to substitute the shorter term "beaker." Thurman recognised three types, designated *a*, *b*, *c*. Type *a* seemed to be the oldest and *c* to be derived from it; *b* had a different secondary origin from *a*. In 25 interments the beaker was accompanied by ancient objects; three with large flint daggers, three with buttons with the V-shaped perforation below, and five with stone wristguards, all of which objects belonged to the later Neolithic period on the Continent. None of the objects found with the remaining 14 interments were of later date than the thin, flat, broad knife-dagger. As no other ceramic type in Britain could show such a pedigree, it was clear that the beaker was the oldest, though before it died out several other types of fictilia came into use. The beakers found with food-vessels and burnt interments were shown by their form and ornament to belong to a rather late period. As ornamentation was a very important subject, 59 examples taken from the three types were exhibited and contrasted. The ornament, like the form, pointed to a different secondary origin for *a* and *b*. The localities where beakers have been found in Great Britain and Ireland were shown on a map. Though *b* was the least represented numerically, it had the widest diffusion, and extended from the coast of Sussex to Sutherland—perhaps to the Shetlands—and was the only type at present known in Ireland. Mr. Abercromby then compared ten photographic examples of type *b* from the Rhine, between Coblenz and Mainz, with ten British. Some of the ornament on the Rhenish beakers was borrowed from a different type, known as the "bell-shaped

beaker." This particular system of ornamentation was found west of the Rhine valley, south of the Danube, east of about the longitude of Vienna, or north of the latitude of Bern. The origin of type *a* could only be suggested, not demonstrated. Its form seemed derived from the much earlier "Schnur-becher" and its later offshoots. But the practice of distributing the ornament in zones or bands was probably owing to the influence of the "bell-beaker." This is an extension of Dr. Götze's theory. Type *b* was derived from a type much more influenced by the "bell-beaker," though some examples of it were perhaps merely later modifications of "bell-beaker." In type *a* the influence of the "bell-beaker" was much less direct, so that supposing both *a* and *b* to be offshoots of the "cord-beaker," they had different secondary origins, but went back to a common form at a point in the many centuries earlier. But the possibility was not excluded that the origin of *b* was to be referred entirely to the "bell-beaker," in which case *a* and *b* had an independent origin. The areas in Central Europe where the "cord-beaker" and its offshoots, as well as the "bell-beaker," were found, were Northern Bohemia and the region of the Saale, a western tributary of the Elbe. Type *b* fully developed occurred on the Rhine both at the centre of its course and near its mouth, and from the Rhine it passed over to Britain.

Mr. W. J. Knowles read a paper on "Objects of the Platin Kind from the Interglacial Gravels of Ireland," and exhibited the implements he had collected. In his paper on "Stone Axes Factories near Cushendall, county Antrim," he explained that there were several centres where stone axes had been manufactured in the neighbourhood of Cushendall, but they were most numerous in Glen-Ballyemon. One well-marked site, a field belonging to Mr. Richard McCurry, in the townland of Tanmaharry, or Tavnagharry, was observed about three years ago on the natural pasture being broken up. Many axes in a rudely-chipped state were found in it—some whole, others broken, probably in the course of manufacture. Mixed up with these were pick-like objects, scrapers and numerous round balls (evidently hammer-stones) of the same kind of stones that from which the axes were made; flakes, too, were in great abundance. Many of the flakes showed dressing or marks of use along the edges. The field containing these objects had an elevated position and commanded a fine view. There was probably an encampment at this place, though he could observe no signs of kitchen-middens or remains of food, such as split bones. While some of the axes in this and other sites in the same county were finely finished, others were very rude. All stages in the manufacture could be easily traced, from the boulder with a few chips removed, and specimens showing more and more chipping, to the completed axe. The axes were of various sizes. One fine specimen was  $14\frac{1}{4}$  inches long, and weighed  $8\frac{3}{4}$  lbs; some weighed 5 lbs, others 4 lbs. to 3 lbs. The average specimen would weigh about 1 lb., and some small chisel-like objects only 1 oz. or 2 ozs. The types were various, some of which might be considered of a newer pattern than others, either introduced or developed from an older type; but most types were among the rudely-made specimens—edges showing various forms of curve, expanding edges, square sides, swages and even kitchen-midden types—all made in the forms at the first, and apparently contemporaneous.

A third paper on "The Manufacture of Arrow and Spear-heads" explained that the majority of Irish flint arrow and spear-heads were made from flint flakes.

Mr. William Cunnington read a paper on a recent important find of palæolithic flint implements at Knowle, in Wiltshire, himself and Mr. William A. Cunnington.

Mr. Robert M. Young, in a paper on the excavation of a primitive site occupied by Irish elk-hunters near Groomsport, county Down, described the remains of a primitive settlement first discovered by him in July 1897 on the county Down coast. The site was adjacent to the sea, beneath a grass-grown field, formerly a sand dune. At a depth of several feet were found a number of burnt-clay hearths, about 1 foot in diameter, surrounded with charcoal and burnt stones. There were numerous fragments of bones, including those of the Irish elk, broken to extract the marrow. Professor R. O. Cunningham had also identified a small species of deer, boar, and probably goat. Shells of limpet and periwinkle of unusual size occurred in masses, and whelks, mussels, scallops and cockles sparingly. The principal relics found comprised a bronze pin, an amulet of flint with natural perforation, burnt-clay food-vessel, simply incised, and numerous implements of schistose slate. From the appearance of the deposit now covering the ancient ground surface, Mr. Young thought that it had been probably deposited by the sea, which to do this must have risen at least 10 feet above its present highest level.

Mr. G. Coffey read a paper on the "Hallstatt Style Ireland," and with the aid of the lantern illustrated it showing a series of slides of objects which had been discovered in several places. The series included the Hallstatt or Tanbrian bronze sword and scabbard chapes, rivetted caldrons, chains and pendants. Mr. Coffey explained in detail the



atures of the Hallstatt technique, and showed how abundant the style was in Ireland. On the question of the introduction of iron into Ireland he thought he deduced from the number of early La Tène in Ireland that iron was known before the close of that period. Mr. Coffey showed three rude stones decorated with La Tène ornament, which constituted a new ornament, as they showed for the first time La Tène on stone.

Mr. Ridgeway warmly supported Mr. Coffey's paper, and lauded the La Tène examples as forming one of the most important discoveries in recent archaeology.

## THE TREATMENT OF SMOKE.\*

(Continued from last week.)

### Incidental Advantages.

Questions that I have suggested as suitable for being put before practical men of science are two—first, whether mechanically and economically possible to substitute for the system of chimneys a method of collection of the smoke from houses by mechanical or thermo-mechanical means, and secondly, whether under these circumstances it would be possible to deposit the soot, electrically or in some part of the course of the air.

I like to point out that such a system would have several advantages. It would provide a persistent and efficient system of ventilation that would enable hot water or steam to be used advantageously much more generally than at present.

Ventilation of a domestic house under existing conditions is largely dependent upon its active chimneys, and treated accordingly. If one could rely upon the extraction of a definite quantity of air, it would be possible to modify the arrangement in various ways for the convenience of the household. To revert to my first suggestion, the sink waste pipe is one of the most useful of appliances, and a corresponding contrivance for the removal of smoke would be found after a little use to be serviceable—it might even replace the carbolic sheet for the isolation of inmates suspected of infectious disorder. At least among the advantages of such a system must be the facility it would afford for diminishing the smoke produced independently of the facilities for its removal after production. At the trials in connection with the Abatement Exhibition, South Kensington, the most successful results were obtained with grates that had what may be called downward draught, that is a draught that carried the smoke from the external coal through the fire. To manage that kind in an ordinary house requires special appliances, but with the provision of means for the constant removal of air, it would be easy to secure these most desirable conditions.

### Position of Local Authorities to the Solution of the Problem.

I proceed to consider the share which local authorities have in obtaining a solution of this problem. Hitherto they have been restricted to fining conspicuous offenders—for reasons which I need not now detail—the penalties for conspicuous failure is not effective; it is needed so long that we might now see whether it could be replaced advantageously by a system of rewards.

For the sake of definiteness I have set down the position of the local authority as equivalent to a tenpenny rate. It would not seem practicable for them to consider the same way as they do to the solution of the sewage problem, maintaining a single municipal system. They could contribute effectively by allowing a specific reduction of rates for properties within their area which were so situated as not to add to the pollution of the atmosphere by

the questions which I have mentioned are to be asked, it is that they should be put in such a manner that the men of science may be encouraged to work out answers, and for that purpose they must make experiments, the practical applications of science on the large scale are very expensive, and the only way of doing them is to take care that they are remunerative to anybody if successful. In this matter the local authority could be of great assistance if they were willing to rate in what seems to me a reasonable manner. The incidence of rating is such as to discourage all of this kind. If an enterprising architect were to design buildings and provide it with means of deliver-

ing its used air free of smoke at an outlay of, say, 1,000*l.*, with an annual cost of 25*l.* for maintenance, I presume the local authority would reward him for his public spirit by increasing the rateable value of the property on account of the outlay, and thus fine the owner some considerable sum per annum for his rash enterprise. The owner would also be placed in the unfortunate position that whereas by avoiding smoke he had conferred as much benefit upon all his neighbours as upon himself, he would have to pay the whole fine of increased rating himself, and would still have all the disadvantages of his neighbours' smoke.

I would suggest that instead of pursuing so unreasonable a course, the local authorities might recognise public spirit of this kind by reducing the assessment of a property that, to the satisfaction of its neighbours as well as of a surveyor or inspector, produced no smoke, so that the rates upon such a property should be decreased by, say, 6*d.* or 1*s.* in the pound instead of being increased. This would afford direct encouragement to practical men of science to design and keep in action means for the prevention of smoke, and would lead to gradual improvement.

In a question which has assumed the proportions of the problem of smoke disposal in our large towns, the possibility of gradual improvement is a very important matter. The suggested action of the local authorities would tend in this direction for two reasons. In the early stages the reduction in the rate would be practically a bounty to those who were willing to make the experiment of effective smoke prevention. It would be a legitimate bounty because in the earlier stages, assuming that the local authority itself initiated no appliances, the experimenters would bear the expense, though they would not derive any special benefit themselves, and would still suffer from their neighbours' smoke. Every fresh adherent would, however, diminish the effective amount of the bounty and also the general pollution of the atmosphere until in the end the distribution of rates would have reverted to its original figure, but on the other hand each householder would have been freed from the disadvantages of his neighbours' smoke.

It would naturally appeal with the greatest force in those quarters where rateable value is high and the advantage of open fires relatively small, and in such places it would be really worth while for practical men to make a serious effort to qualify for the reduction of rate. In the City of London, for example, there must be many properties with very high rateable value, whose facilities for contributing smoky air are already limited to one hot-water furnace and a few open fires. For such establishments it would be an experiment on a very small scale to arrange matters to obviate smoke altogether, and satisfy the surveyor or inspector that the property was smokeless and thus secure the reduction of rate. There might be some difficulty at first in establishing a qualification, but it could not be greater than the difficulty of establishing a right to a Parliamentary vote. In the course of time the smoke producers would be a few exceptional persons paying exceptionally high rates, a very rational state of affairs; and when the City of London had by the gradual extension of such experiments freed itself from its own smoke, I think we might safely rely upon the citizens to take care that the indirect economies to which they would be legitimately entitled by their public spirit were not destroyed by the unrestricted smoke production of the surrounding boroughs.

I have made the system of the general collection of smoke by mechanical means for the purpose of treatment the basis of my remarks, but I have already disclaimed any desire for exclusive privileges for that particular form of experiment in the purification of smoky air. If it be feasible on the commercial scale it has the advantage in an especial manner of making successive improvements possible. The smoky air of London is injurious, not only on account of its visible soot, but also on account of the sulphurous acid and other invisible products of combustion which accompany the soot in the first instance. If it be found possible in the first place to deposit the soot particles, attention might next be turned to some means of dealing with the noxious acid fumes, at least, in those cases where they are specially abundant.

In setting down an estimate of the cost of the system as equivalent to a rate, I fear I may alarm some overburdened ratepayers. I therefore hasten to point out that I am not suggesting that the local authorities should levy an additional rate in order that they may experiment upon the mitigation of the smoke nuisance, nor indeed that they should necessarily levy any additional rate at all. Of course if addition is made to the domestic appliances of houses, the householders will, somehow or other, have to pay for them, and, therefore, when the system became complete, the distribution of cost would probably become assimilated to the distribution of rateable charges. But in the early stages it would be sufficient to encourage private and voluntary enterprise by the reduction of rates in the few cases where a qualification could be established, and the additional burden thus thrown upon the large majority of ratepayers not sharing in the direct cost of

\* Read before the Congress of the Sanitary Institute by Mr. H. W. Haw, M.A., Sc.D., F.R.S.



the experiments for the good of the community would be unimportant.

Such a system would thus be, in the first instance, a direct encouragement to progressive experiments, and in the end would enlist the active support of all those possessing arrangements for avoiding smoke in favour of effective compulsion for those who had not.

To put the questions I have indicated to men of science in this way would be merely a matter of business, and, if the questions were so put, I venture to express the confident opinion that the science of the twentieth century would give as satisfactory an answer to the question of the treatment of smoke as the science of the nineteenth has given to the question of the treatment of sewage.

### WEST HARLING CHURCH RESTORATION.

THE parish church of West Harling, a pretty village some seven miles from Thetford, and a little over two from Harling Road station, has just undergone a thorough restoration.

The work just completed comprises the entire renewal of all the roofs in English oak. The nave and porch are open-timbered, constructed on the lines of existing examples. The chancel roof is panelled beneath its timbers, and at the intersection of the mouldings are carved bosses. Externally, the roofs are covered with red hand-made flat tiles. The whole of the wrought stonework has been cleaned of whitewash, and its original surface exposed. As little new stone as possible has been inserted, and all tool-marks of the early masons have been jealously preserved. The walls have been underpinned and strengthened where necessary. The windows have been re-glazed, every piece of early glass being preserved. The warming is effected by one of Bradley's underfloor stoves. In the new reredos are embodied some interesting fifteenth-century carved panels, probably of Flemish workmanship, illustrating the early life of Our Lord.

During the work of restoration the lower stonework, more particularly of the transept and chancel, when exposed, bore decided traces of fire, but there appears no record existing of a conflagration. Most of the old stonework dates back to the thirteenth century, while in the nave the lower parts of the walls are very much earlier in date. In the nave an old stone staircase leading to the rood-loft, no longer in existence, was exposed and left. This is fourteenth-century work, and quite perfect, and traces of the iron fastenings for the door are seen. A piscina in fairly good order was found on the south side of the nave, also an archway, which formed part of the lady chapel, removed in 1730. The piscina appears to have served both for the church and the lady chapel. A doorway was discovered leading from the churchyard into the chancel on the south side, and several old windows have been exposed, including a lancet window opening from the church into the vestry, which was originally a mausoleum for the Crofte family. An aumbrey, double piscina and several sedilia have also been exposed, and some old stencilling, which has also been preserved. A very handsome new reredos has been erected, the frame being of oak, and the panels, five in number, of very old oak, illustrating the Birth of Christ, the Wise Men, the Annunciation, the Presentation in the Temple, and Christ before Pilate. The new roof has been raised to a good height, and in the chancel there are carved bosses in the intersection of the mouldings.

### THE INTERNATIONAL ART EXHIBITION, VENICE, 1903.

THE Municipality of Venice has opened a competition among Italian and foreign artists for the best design, modelled, for a large gold medal to be awarded to the most important works shown at the International Art Exhibition of 1903. The medal must bear on the obverse an allegorical figure of Venice and her artistic glories, surrounded by the inscription, "La Esposizione Internazionale d'Arte della Città di Venezia, 1903," and on the reverse side the words, "Gran Premio della Città di Venezia," leaving a blank for the name of the successful competitor, the whole to be surrounded by an ornamental border. Every competitor must send in the models of the obverse and reverse sides of the medal executed in either wax or plaster, the models must have a diameter of exactly 120 mm., and the competitors must send, together with the models, the respective photographic reproductions measuring 40 mm. in diameter, which will be the dimensions of the medal. The Municipality of Venice has allotted a prize of 3,000 lire to be awarded to the author of the model judged the most deserving of reproduction, and judgment will be given by a commission composed of the Mayor of Venice, president of the exhibition, the general secretary and three artists. The

models for competition must reach the office of the exhibition (Municipio di Venezia), post-paid, not later than January 31, 1903, and must be signed with a motto must also be written on a sealed envelope containing full name and address of the competitor.

### THE PROVISION AND CONSTRUCTION OF SANATORIA FOR TUBERCULOSIS.

IT is only possible in the limited time at my disposal of this interesting subject in a very sketchy manner. Many excellent sanatoria of Germany have done much for the cure of consumption, but it is advisable that there should be an extension of the same system at home in words, the establishment and maintenance of British sanatoria for British patients. No less an authority than Dr. A. C. S. has said:—There are many places in this country on a dry soil and in a sunny sheltered part on the south slope of some upland, most of the conditions can be obtained, which are now dearly bought and far sought, and the results obtained, in distant parts of the world. If they were adequately provided for the treatment of tuberculous cases, we do for all varieties of infectious fever, for the insane, and the insane, it is better that we should do so, rather than be obliged to send such cases far away in search of the possibilities of this cure "at home" should be open to the very poor as well as to the rich. Though sites of the kind of many of the continental sanatoria are not available, it is not everything, provided the principal requirements of a sanatorium and shelter be complied with.

Out of twelve British sanatoria for paying patients, three are at a greater altitude than 400 feet above sea-level, and good results are recorded at all of them. In the larger sanatoria large wards are not desirable, but a liberal provision of single bedrooms for the patient and the avoidance of the extravagance which the provision of single rooms would entail, it is well to have a few small wards for two or six beds each. The six-bed ward is about as large as can be found desirable.

Open balconies at the upper floor levels in front of the room windows, which should in all cases open down to the floor, are better than verandahs in front of the ground-floor windows; they need not be more than 4 feet in projection from the wall, as this is ample to allow of the bed or couch being laid longitudinally thereon, if the patient be too weak for outdoor exercise. The balcony is much more "airy" than a covered verandah—unless the latter can be arranged to open after the manner of those at Ruppertsheim in Germany, where they are lateral extensions to the east and west of the building, and, of course, offer no obstruction to the circulation of light and air. But of more importance is the ample provision of small shelters in the grounds at a reasonable distance from the building. These compel patients to enjoy a little walking exercise, and induce them to indulge fully in the "open-air" treatment, and these should be so arranged as to screen the occupants from the winds.

Large and well-lighted, cheerful and bright sitting-rooms should be provided, for though the "open-air" treatment is the chief object of the sanatorium, there are times when a little social intercourse amongst the patients is advantageously beneficial. Due attention, of course, must be paid to the upholstery of furniture, and the entire absence of heavy carpets and tapestry curtains.

The dining-hall should likewise be as light and cheerful as possible, and it is of great importance that it should be completely isolated from all other parts of the hospital, and equally so by means of a well-ventilated corridor from the kitchen. The kitchen should be lofty and well ventilated at the roof, rooms, of course, being placed over it.

Special attention should be paid to the proper planning of the sanitary adjuncts. The baths and water-closets should be placed in turrets, in themselves well ventilated, and should be completely isolated by means of cross-ventilated connecting corridors, entirely detaching them from the main building.

The further adjuncts of a well-planned and equipped sanatorium will readily suggest themselves, such as ample provision of patients' clothes stores, where garments not in general use can be put away, thus relieving the bedrooms of superfluous furniture, of which the less there is the better; bedrooms and boot-cleaning rooms are likewise useful accessories, and of course, in addition to the nurses' duty-rooms, servants' rooms must be provided, where the sundry domestic articles for cleaning, &c., can be kept.

In addition there are the thousand and one small details which will naturally suggest themselves to the skilled architect.

\* Abstract of a paper by W. Cecil Hardisty, read at the Congress of the Sanitary Institute at Manchester.



which cannot be dealt with in a short paper such as this, which will require their due and proper consideration. Nurses and domestic servants should be provided for in some little distance from the main building, for much attention is given to the healthy housing of the patients, no less care should be devoted to the homeliness and comfort of those upon whom devolves so much responsibility in the success or otherwise of the treatment prescribed. It should be remembered that the short walk from the one building to the other ensures an entire isolation from the atmosphere of the hospital, a veritable going "off duty," and a retirement for a while to the quiet and restfulness of home life. As in the sanatorium in the nurses' home, let brightness, cheerfulness and comfort be the keynote, and let all be done for the health and comfort of those upon whose strength and vigour depends the success of the treatment.

These conditions be carried out thoroughly, let us hope that the not far distant future it may be superfluous for this body to discuss the question upon which it has been called upon to address you.

## TESSERÆ.

### Qualities of Sculpture.

It may be described as that appropriate action or manner which displays beauty in its fullest degree, and from it all that is opposed to the impression it should produce. Animals are at all times graceful in their different motions because their motions are perfectly unrestrained, and adapted to the occasion; but in man grace is dependent upon inward restraining or governing of the body by the mind, guided by a certain inherent sense of the propriety of the action, which prevents in it the occurrence of awkward movements, or attitudes, and imparts to it at the same time the grace of its own inward sentiments or feelings; so it is that of art, whether considered as to their design or execution. An expression may be carried out in sculpture so thoroughly intelligible, a story may be told with force, and the means be not judiciously chosen, the attitudes as well as effective, the artist has not properly used the resources of his art; he has only copied, not selected. Grace, in sculpture, implies elegant variety of line, tasteful and judicious subordination of parts, delicate finish and appropriate workmanship corresponding in its style with the character of the entire design and aiding it in its effect. Grace is a false grace particularly to be avoided in sculpture, which arises from the action of the figure emanating, not from involuntary emotion of the heart, or from a sudden impulse, but from a vain desire to display the figure in its form. The movements caused by affectation are exaggerations of those lines of grace created by the influence of natural influences. Dancing, so far as it is concerned with joy and mirth and exhibits the effect of a flow of grace, but when studied for the display of the figure becomes affectation. Theatrical is a term applied to art when the expression is too powerful for the cause which it is derived, or the action too violent for its purpose, when the figure or group appears anxious to display others its action or emotion. Whenever strong and powerful movement is portrayed in sculpture it should be clearly defined and be of corresponding strength, and should say, be of still greater strength, for the outward effect of feeling as shown in the features and limbs is but a reflection from a shock received in a system passively and, like the rippling rings in the water, must be seen to further it recedes from its central or primary

### The Burgh of Mousa.

The Valley of Glenelg and in the Shetland Isles are the seats of several conical buildings, which are merely places of refuge without any means of assailing an enemy. The most famous of these is one in Shetland, well described by Dr. Hibbert in the Burgh of Mousa, and is situated close to the sea. It is most ingeniously contrived for mere security. The building is double and constructed of rude stones without mortar, and built in two concentric circles, each from 4 to 5 feet thick, with a vacancy between them of 5 feet. The distance from the out to the inside is 15 feet at the widest part. The two walls are united by long and broad stones which tie them together. These stones are so placed as to rise to the first platform, and are continued half round the building on a flat or horizontal line, so as to form a continuous platform between the walls, when the stair is again resumed to the second platform, and the gallery again formed half round in the same manner the stairs and galleries are continued to the top of the structure. The diameter of the building at the base is 150 feet, the height 42 feet, and the building is erected on a circular form like a glass-house, but towards the top it

leaves the conical shape, bulges out, and is carried up in rather a perpendicular line. This stronghold was quite open at the top, the galleries having each a square opening to the interior by way of window, served as chambers to the inmates, as high up in the building as the distance of the two walls would admit, for they gradually approached till they joined at the top; at the same time, the stairs and galleries bound the walls from top to bottom. There was no window on the outside. The only entrance was a low door through the outward wall only, then a passage led half round the base between the two walls, and an opening or door through the second wall (thus placed opposite the outward door) gave admittance into the interior open area. It was impossible to scale the building from its peculiar construction. If the only doorway was well blocked up by large stones, no entrance could be made; but if made, the inhabitants in the galleries could shower down stones upon the assailants.

### Engraving and Painting.

An engraving bears somewhat the same relation to a picture that a play read does to a play acted. It does justice to the intellect of the artist, but not to the power, splendour and magnificence of the art. No picture, the effect of which is wholly lost in a good engraving, can afford a real gratification or deserve to rank with the works of dignified art. It is a motionless spectacle, a painted melodrama, but neither tragedy, comedy, history nor good broad farce. Engraving cannot, indeed, bewitch the eye with colour, but it can give the most delicate gradations, combinations and interchanges of light and shade. The pleasure of colour is more in the sense than in the mind—the utmost skill in mere colouring only makes the painter a rival if he be not a rather humble imitator of the velvet manufacturer. Engraving, too, partakes of the ubiquity and reproductive power of printing. It enables many who can never visit the Vatican to satisfy themselves that the fame of Raphael and Buonarrotti is not a vain sound; and it will bear testimony to their glories if the works of their hands be doomed to perish like those of Apelles. Engraving, in fine, puts the enjoyment of art within the compass of moderate incomes, and fills up little room in a moderate mansion; therefore it brings art within the range of popular sympathy.



### Unfading Green Slates.

SIR,—In view of our having repeatedly had occasion to explain to architects and others our necessity for being unable to accept orders for "Eureka" slates excepting at higher prices than those we quoted when estimates were being prepared, we should greatly esteem if you would permit us, through your columns, to state that owing to the present "boom" in the United States prices of all slates there have gone up by leaps and bounds, including the prices charged by the "Eureka" Quarries. We have, in fact, having in mind the stocks we hold, not found it necessary at present to put on even the full advance charged by the quarries; and we trust that if your courtesy permits of the insertion of this letter, it will serve to assure both architects and contractors that the somewhat increased cost per square we now quote is caused by the rise in the quarry list price, and for no other reason whatsoever.

We need hardly add that orders placed with and accepted by us before the rise was advised are executed at old prices.—Yours obediently,

ROBERTS, ADLARD & CO.

September 12, 1902.

### Fireproof Wood.

SIR,—Your interesting extract in the issue of the 5th inst. from the *New York Times*, giving an account of tests with fireproof wood, shows a strange misconception on the part of the experimenters with the uses and purposes of this material. It appears that they subjected the fireproof wood to a temperature of 3,500 degs. Fahr. This, as every one knows, is a temperature which readily melts steel; it could, therefore, be only natural that the fireproof wood was reduced to carbon in almost the same time as the ordinary wood. A test of this kind is not only of no practical value, but tends to mislead persons unfamiliar with the material.

The object of fireproof wood is to prevent fires occurring at all. Wood is practically the only building material from which there is any danger as regards fire. Iron, concrete, brick, stone, glass, slate and other building materials in common use are perfectly safe from catching fire. It is wood and wood only that gets alight, forms fuel and spreads flame. A proper test of fireproof wood is to suspend two boards (one treated and the other not), say 6 feet long, 6 inches wide and 1 inch thick,



in a fire. In a minute or so the untreated board will have caught fire, and the flames will be spreading. In 7 or 8 minutes the untreated board will be totally consumed by its own flame. The fireproofed wood board, on the contrary, will be only slightly charred at the point where it is in contact with the fire. To destroy it by the same fire that consumed the untreated board would take instead of 8 minutes nearer 8 hours carbonising, because such could only be done little by little, inasmuch as there is no spreading of the flame.

It is really astonishing how little is known among architects of the extraordinary importance of fireproof wood. They do not seem to grasp the idea that now for the first time in the history of the world a building may be rendered truly fireproof and not sham fireproof as heretofore.

The following extracts from a letter written by Mr. L. Benoist, the distinguished chief of the Montreal Fire Brigade, after thorough tests of fireproof wood, show that practical men who have daily to fight fire are beginning to realise the capabilities of fireproof wood:—

“Montreal Fire Department,

“Montreal: May 20, 1902.

“Dear Sir,—Having investigated very carefully the process you employ in rendering wood fireproof at your factory at Cole, St. Pauli, also having made personal tests of the wood so treated, I have no hesitation in recommending it very strongly for use in buildings of every description, and more especially for public buildings and institutions.

“I am thoroughly convinced that any building having all the woodwork treated by the fire-resisting chemicals which you use cannot be destroyed by fire.

“I would state as the result of my investigations that I have come to the conclusion that where the contents or stock of a large ware-room or building should take fire, and should the woodwork be treated with your process, the risks to the lives of firemen in performing their duties would be materially lessened, and they would be greatly assisted in saving the contents and human lives in such a building, owing to the absence of smoke from the woodwork.

“I might also add that nothing during my experience—covering as it does nearly a quarter of a century—has so appealed to me as the fear which is unconsciously brought home to the average fireman when a fire occurs in what is termed a modern fireproof building.

“The fireman at once realises ‘fireproof’ usually means a steel-constructed building of steel beams, girders, &c., which under intense heat usually collapses, and he is caught like a rat in a trap; whereas, if the steel girders, beams, &c., were encased with fireproof wood he would be safe, for the reason that the heat could not penetrate the wood fireproofed by your process.

“I firmly believe that fireproofed wood is destined to become the most valuable feature in the construction of modern buildings, and it is at the present time really impossible to conscientiously estimate its great value and public worth.—Very respectfully yours,

“(Signed) L. BENOIST, Chief Montreal Fire Brigade.”

Hoping that the above will serve to dispel the prevailing misconceptions regarding this valuable material.—Yours faithfully,

W. C. DICKENSON.

22 Hereford Square, South Kensington, S.W.:

September 13, 1902.

## GENERAL.

**The Duke of Argyll** has appealed for 3,000*l.* or 4,000*l.* for the reparation of the Castle of Dunstaffnage, where the Coronation-stone was kept for centuries.

**The Royal Society of Antiquaries of Ireland** will hold their quarterly meeting in the Tholsel, Kilkenny, on October 7. After the business has terminated, places of interest in the city will be visited. Excursions have been organised for the following day.

**Mr. William Frederick Fairrell, M.I.C.E.**, of Sandhurst, Tunbridge Wells, who died on July 3, has left property valued at 135,900*l.* 15*s.* 8*d.*

**The Westminster Construction Company's** tender has been accepted for the new pumping station to be erected near the North Railway jetty in Portsmouth Dockyard.

**The Abbé Delapart**, the eminent French archæologist, recently died at Tebessa. His labours were chiefly confined to Algeria, where he worked for forty years.

**The Southend Technical School**, which provides accommodation for 375 students and has been built by the Town Council at a cost of 20,000*l.*, towards which the Essex County Council has contributed 5,000*l.*, was opened on Saturday. The building was erected according to the design of Mr. H. T. Hare.

**The Portsmouth School Board** have decided to borrow 4,513*l.* for the improvement of Kent Street school.

**The British Association** will meet at Southport under the presidency of Sir J. Norman Lockyer. The proceedings will open on September 9. Cambridge is expected to be the venue for the following year's congress.

**The London and South-Western Railway** have intimated to the Kingston-on-Thames Union their acceptance of a net assessment of 128,000*l.* for property situated within the union, which extends from Wimbledon to Hampton, and includes those parishes of Kingston, Teddington, Surbiton, Esher and Dorking. The new assessment represents an increase of over that of ten years ago, when the railways were laid out.

**Mr. Waterhouse, R.A.**, continues to make progress in the recovery of his health. He is at frequent drives in the neighbourhood of his house, at Court, near Newbury.

**The Paris Municipality** and the Seine General Council are shortly to commence the erection of a school of arts and crafts. A site has been chosen in the Boulevard de Haussmann. The cost will be 5,000,000 francs, of which the State will contribute one-fourth.

**The Brighton Corporation** propose to seek powers in the next session of Parliament for the construction of the tramway, which are estimated to cost 37,156*l.*

**The School of Photo-Engraving and Lithography** of the London County Council will be opened on September 29 for its eighth session.

**The National Gallery of Ireland** has been enriched by the following purchases during the past year:—*A Boy with Angels*, by Lorenzo di Credi (250*l.*); *Portrait of David*, eleventh Earl of Buchan, by Raeburn (100*l.*); *Solitude*, by Richard Wilson (120*l.*); portrait of a nobleman by Morland (50*l.*); and *The Virgin and St. Joseph with the Infant Christ*, by Lorenzo Costa (1,250*l.*). A great number of drawings and studies by the late Sir F. W. Burton, number of portraits in chalk, pencil and mezzotint, and engravings were also acquired. Among the donations received were a portrait of John Philpot Curran, by Sir Thomas Lawrence, presented by Lord Iveagh; and a portrait of Frederic W. Burton, R.H.A., by H. T. Wells, R.A., presented by Mr. H. T. Wells.

**The Autumn Exhibition** in the Walker Art Gallery, Liverpool, under municipal auspices, was formally opened on Saturday. Eight rooms and a stairway are devoted to the display of oil-paintings, water-colour drawings, miniatures, sculpture, art jewellery, metalwork and pottery, the number of exhibits being nearly 1,600, of which a great number are pictures.

**Mr. Thomas M. Rickman**, of 8 Montague Street, Russell Square, informs us that he has taken Mr. E. J. Burr, his assistant, into partnership, and the firm in future will be known as Rickman & Burr.

**The Northern Architectural Association** will hold their excursion meeting at Newcastle to-morrow (Saturday). The new buildings in Dean Street and Collingwood Street will be visited.

**The Premises** required for the enlargement of the Victoria Station (L.B. & S.C.R.) are now almost removed, and the site is ready for the new works. It is expected that the cost will amount to about two millions sterling.

**The French National Library** has acquired a papyrus believed to be unique. It is of the Græco-Alexandrian epoch, probably of the first century of our era. The papyrus is a fragment of a romance, and the text is adorned with illustrations. This is said to be the first illustrated literary papyrus discovered.

**The Secretary of Scotland** has appointed a committee to inquire into the constitution, powers and duties of the Board of Manufactures, with special reference to the administration of the grants made by Parliament for purposes of agricultural improvement, and to report whether, and in what way such administration may be improved. Mr. Akers-Douglas will act as chairman, and Mr. Ewan F. Macpherson as secretary to the committee.

**The Central South African Railways Authorities** have placed an order in England during the past week for 104 carriages, 38 engines and 250 steel coal trucks, valued at 80,000*l.* capacity.

**Mr. Sidney Paget** is engaged in painting a portrait of John Aird, M.P., the mayor of Paddington, which is to be presented to Sir John in the name of the Borough Council on his retirement from the mayoralty in November.

**The Italian Government** have had a plan prepared for the reconstruction of the Campanile of Venice at an estimated cost of 2,000,000*l.* It will be erected on the site of the old one, but will be modified at the upper part.



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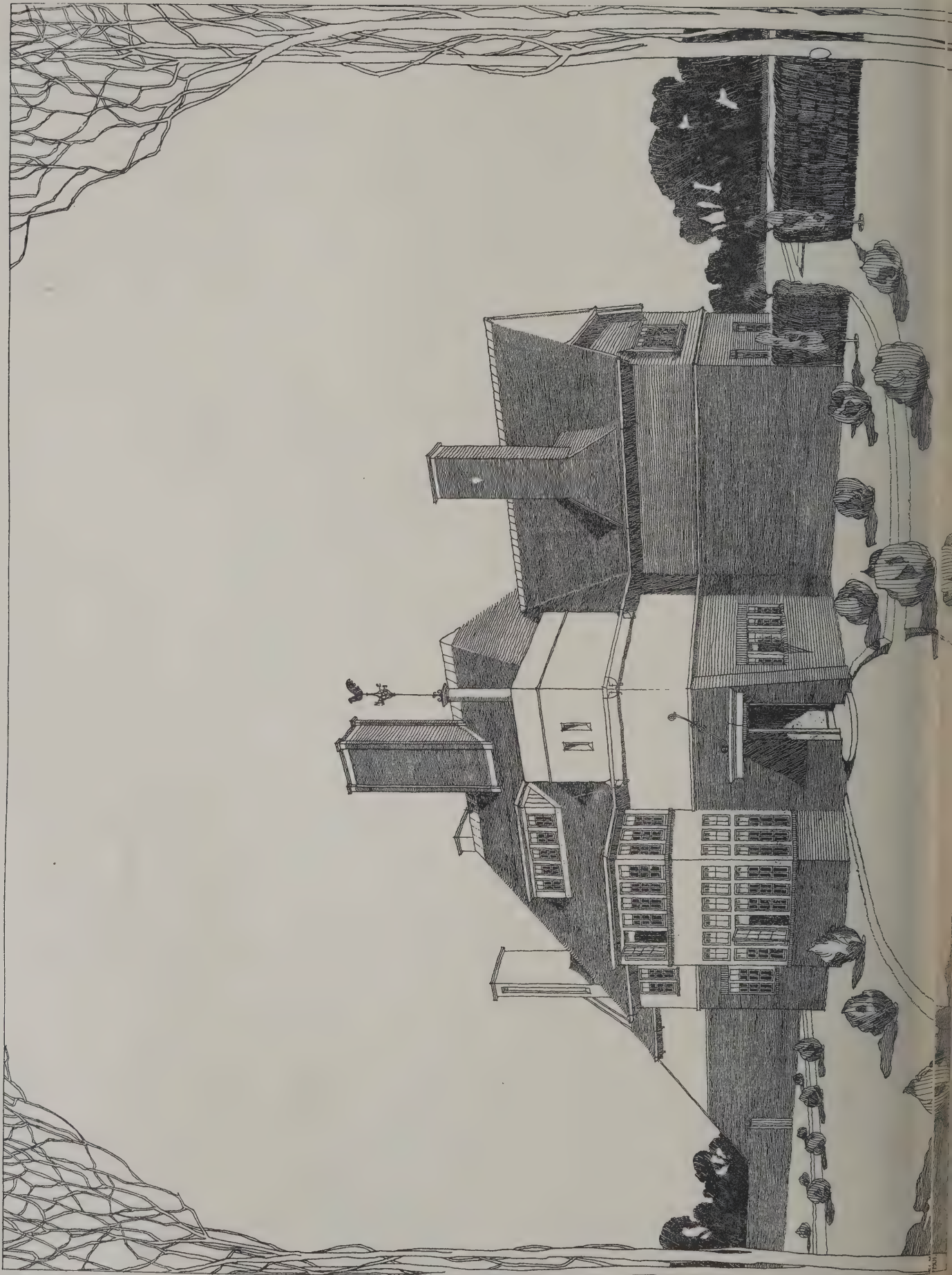




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The Architect, Sep<sup>r</sup> 19<sup>th</sup> 1902.





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T. E. COLLCUTT, F.R.I.B.A., Architect.







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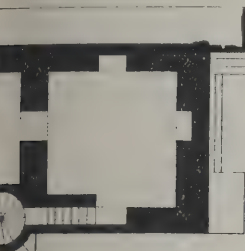
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J. S. CORDER.

DRAWN BY J. S. CORDER.

SCALE TO ELEVATIONS & PLANS.

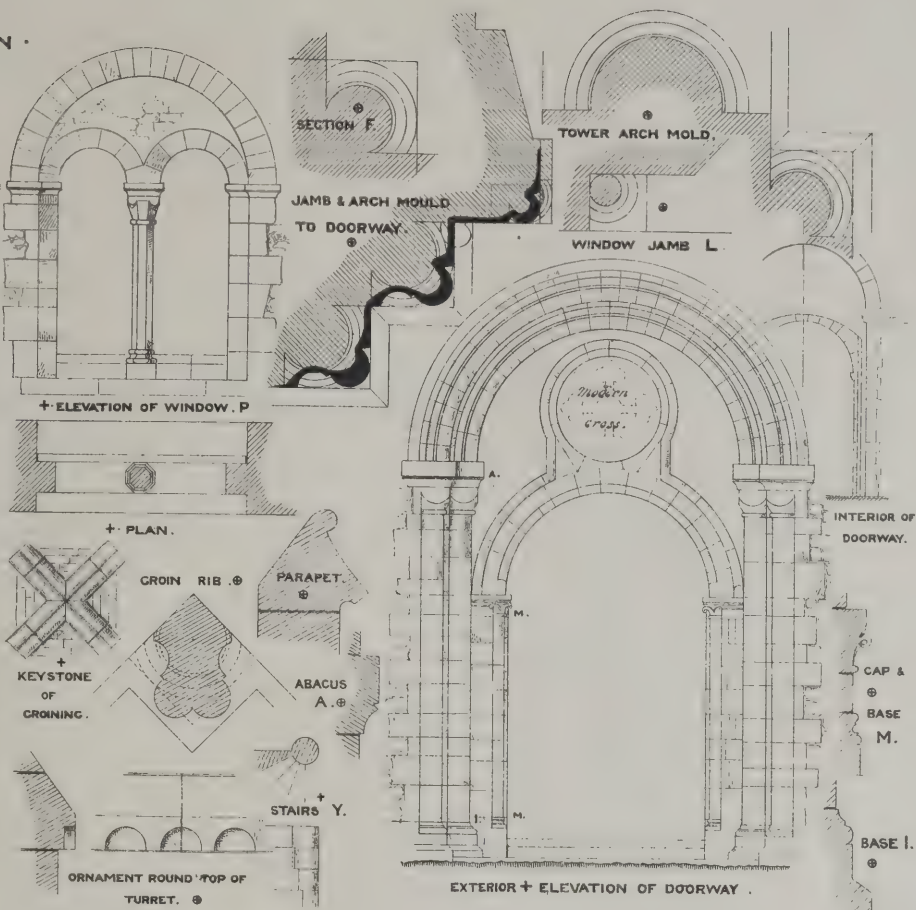
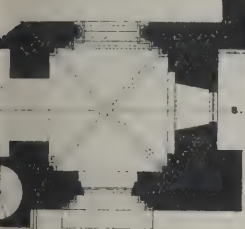
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SCALE TO DETAILS MARKED +.



PLAN OF RINGERS' STAGE.

GROUND PLAN.



+ ELEVATION OF WINDOW . P

+ PLAN .

GROIN RIB ⊙

PARAPET ⊙

+ KEYSTONE  
OF  
CROICING.

ABACUS  
A. ⊙

+ STAIRS  
Y.

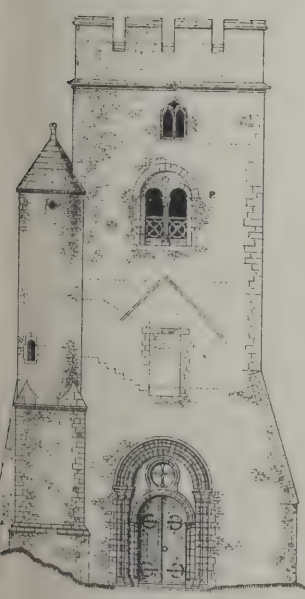
ORNAMENT ROUND TOP OF  
TURRET. ⊙

EXTERIOR + ELEVATION OF DOORWAY .

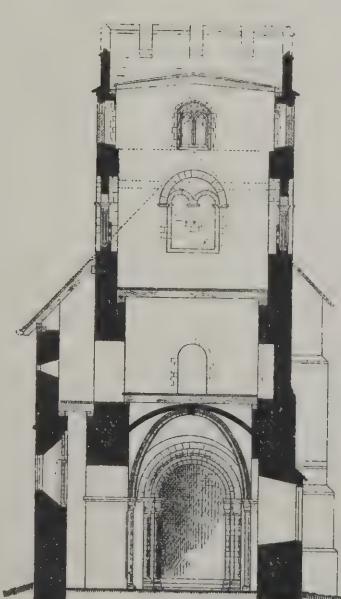
INTERIOR OF  
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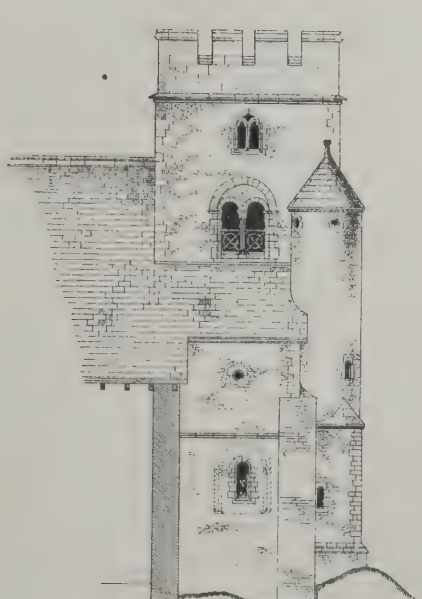
BASE I.  
⊙



WEST ELEVATION.



SECTION A · B.



NORTH ELEVATION .









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PREMISES AT CROYDON.

SYDNEY PERKS, Architect.







# THE Architect and Contract Reporter.

## EDITORIAL NOTICES.

*view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*Authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*Communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Respondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

## TENDERS, ETC.

*As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

## COMPETITIONS OPEN.

**BIDEFORD.**—Sept. 25.—The Town Council of Bideford are it to erect municipal offices and a public library upon a opposite the west end of the Long Bridge, Bideford, and invite designs for the proposed buildings. Premiums of 15*l.* and 10*l.* respectively are offered for the designs which be placed by the Council first, second and third in order merit. Designs and descriptions, &c., are to be delivered to Mr. Wm. B. Seldon, town clerk, 18 The Quay, Bideford.

**CAPE TOWN.**—Jan. 31.—The Council of the University of Cape of Good Hope invite designs for the erection of university buildings. Premiums of 40*l.*, 20*l.* and 10*l.* will be awarded to the authors of the designs placed first, second and third respectively. Particulars of the competition may be obtained on application to the Registrar at Cape Town, or to the Agent-General in London.

**GREENWICH.**—Oct. 9.—Designs are invited for a public library (with chambers for chief librarian's residence) to be erected at a cost of about 6,500*l.*, with fittings, on a site about 100 feet super, in the borough of Greenwich. Premiums of 100*l.* and 50*l.* are offered. Particulars can be obtained on application to the Greenwich Borough Council.

**INDIA.**—Nov. 1.—Competitive designs are invited for the erection of a memorial to Her Majesty the late Queen Victoria at Allahabad. A premium of 2,000 rupees will be awarded to the design selected by the committee. Mr. H. Nelson Wright, Indian Civil Service, honorary secretary, Queen Victoria Memorial Fund Committee, Allahabad, India.

**MAIDENHEAD.**—Oct. 1.—Designs for free library. Premiums offered of 50*l.*, 20*l.* and 10*l.* respectively. Mr. John Kirk, town clerk, Guildhall, Maidenhead.

**NEWARK.**—Oct. 14.—Designs and suggestions are invited for alterations and additions at the infirmary, Bowbridge Road, Newark, comprising a board and committee-room, a new mortuary and provision for twenty extra beds. A prize of twenty guineas is offered for the best plans sent to the office of Mr. M. H. Colton, clerk, 27 Lombard Street, Newark.

**STROOD.**—Oct. 15.—Plans are invited for further hospital accommodation on a site recently acquired by the Strood Rural District Council in Whitehill Road, Cobham. "A premium of 15*l.* 15*s.* is offered for the best set of plans submitted.

## CONTRACTS OPEN.

**ASHFORD.**—Sept. 26.—For enlargement of the committee-room at the schools at Ashford, Middlesex. Mr. F. W. Roper, architect, 9 Adam Street, Adelphi, W.C.

**AYLESBURY.**—Oct. 8.—For installation and maintenance of electricity for a term of years. Mr. Percy A. Wright, clerk, Town Hall, Aylesbury.

**BARNET.**—For erection of piggery, boiling-house, &c., and for erection of cupboard fittings in the storeroom at the workhouse. Messrs. White, Son & Pill, surveyors, 13 and 15 High Street, Barnet.

**BIRKENHEAD.**—Sept. 25.—For additions to the public baths, Argyle Street South. Mr. Charles Brownridge, borough surveyor, Town Hall, Birkenhead.

**BIRKENSHAW.**—Sept. 22.—For erection of a pair of semi-detached villas at Birkenshaw, Yorks. Messrs. Walker & Collinson, architects, Swan Arcade, Bradford.

**BIRMINGHAM.**—Sept. 22.—For alterations and additions to a house in Oak Tree Lane, Selly Oak. Mr. Edwin Docker, clerk to the Guardians, 10 Newhall Street, Birmingham.

**BIRMINGHAM.**—Sept. 22.—For erection of a reading-room at Aston Cross. Mr. G. H. Jack, surveyor, Council House, Albert Road, Aston Manor.

**BIRMINGHAM.**—Sept. 25.—For erection of stabling, roller-house, workshops, offices, foreman's house and one cottage. Mr. G. H. Jack, surveyor, Council House, Albert Road, Aston Manor.

**BLACKBURN.**—Sept. 22.—For supply of one electrically driven travelling crane. Messrs. Lacey, Clirehugh & Sillar, 2 Queen's Anne's Gate, Westminster.

**BLACKPOOL.**—Sept. 23.—For supply of steel rails, fish-plates, bolts and nuts, tie bars, crucible cast-steel points and crossings. Mr. John S. Brodie, borough engineer, Town Hall, Blackpool.

**BRISTOL.**—Sept. 25.—For repairs, cleaning and painting the schools, almshouses and city properties, including the keeping in repair of roofs of same for a period of five or seven years, for the Trustees of the Bristol Municipal Charities. Messrs. Foster & Wood, surveyors, 35 Park Street, Bristol.

**BUDDINGTON, NOTTS.**—For erection of a lace factory and power-house and chimney. Mr. E. R. R. Ridgway, architect, Long Eaton.

**BURTON SALMON.**—Sept. 24.—For erection of station buildings, warehouse and station-master's house at Burton Salmon, for the North-Eastern Railway Company. Mr. William Bell, the company's architect.

## SPECIALTY.



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With Specially Constructed Patent Blocks.

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**BURTON-UPON-TRENT.**—Sept. 27.—For erection of a Turkish-bath adjoining the existing public baths. Mr. George T. Lynam, Town Hall, Burton-on-Trent.

**CHELMSFORD.**—Sept. 25.—For erection of laboratories for the technical instruction committee of the Essex County Council. Mr. Frank Whitmore, architect, Duke Street, Chelmsford.

**CHELMSFORD.**—Oct. 2.—For erection of county offices in Tindal Square, Chelmsford. Mr. Frank Whitmore, architect, Duke Street, Chelmsford.

**CHICHESTER.**—Sept. 29.—Contract No. 1, for construction of precipitation tanks, filters, boiler-house, pump-house, pneumatic ram pit, stable, cart shed and various other works in connection therewith. Contract No. 2, for construction, erection and setting to work of pneumatic forcing ram, sludge press and other machinery and appliances incidental thereto. Mr. J. W. Leader Cooper, town clerk, Town Hall, Chichester.

**CHRISTIANIA.**—For supply of about 106 tons of iron lattice bridges, particulars of which may be seen at the Foreign Office, London.

**CITY OF LONDON.**—Sept. 26.—For erection of new premises at the corner of Newgate Street and Warwick Lane. Town Clerk, Public Health Department, Guildhall, E.C.

**CORNWALL.**—Oct. 6.—For alterations and additions to the Tinner's Arms, Zennor. Mr. N. C. Whear, jun., architect, Penzance.

**COVENTRY.**—Sept. 25.—For rebuilding the Mermaid inn, Gosford Street. Mr. Herbert W. Chattaway, architect, Trinity Churchyard, Coventry.

**DERBY.**—Sept. 29.—For erection of a school on the Normanton Road. Mr. A. Macpherson, architect, Tenant Street, Derby.

**DEVONPORT.**—Sept. 23.—For erection of a school in Ker Street, Devonport. Messrs. Hine & Odgers, architects, Lockyer Street, Plymouth.

**DUKINFIELD.**—For erection of a bank and post office in Dukinfield. Messrs. John Eaton, Sons & Cantrell, architects, &c, Stamford Street, Ashton-under-Lyne.

**DURHAM.**—Sept. 22.—For erection of seven almshouses at Fighting Cocks. Messrs. Clark & Moscrop, architects, Darlington.

**DURHAM.**—Sept. 24.—For alterations and additions to Primitive Methodist chapel, Phoenix Row, Etherley. Mr. F. H. Livesay, architect, Bishop Auckland.

**FEATHERSTONE.**—Sept. 22.—For extension of the George Street Board schools. Mr. W. Hamilton Fearnley, architect, Station Lane, Featherstone.

**GATESHEAD.**—Sept. 24.—For completion of offices in Swinburne Street. Mr. J. Bower, borough surveyor, Town Hall, Gateshead.

**GRAVESEND.**—Sept. 24.—For erection of a mortuary coachhouse and stable, and store for disinfectant at the infection hospital, Whitehill Road, Cobham. Mr. G. E. Bond, architect, Pier Chambers, Chatham.

**GREENWICH.**—Oct. 14.—For erection of a weights and measures testing office, with stable building and a coroner's court in Lamb Lane. Particulars may be obtained at the General Section of the Architect's Department, 18 Pall Mall East, S.W.

**HALIFAX.**—Oct. 4.—For erection of two semi-detached villa residences, Skircoat Green Road, Halifax. Messrs. Geo. Buckley & Son, architects, Tower Chambers, Halifax.

**HAMMERSMITH.**—Sept. 23.—For erection of board-room clerk's offices, receiving home for children and out-relief office. Mr. J. H. Richardson, architect, 87 Finsbury Pavement, E.C.

**HAMMERSMITH.**—Sept. 24.—For erection of a block of workmen's dwellings, in Yeldham Road. Mr. H. Thompson, town clerk, Town Hall, Broadway, Hammersmith.

**HARROW.**—Oct. 14.—For erection of a court-house in Harrow, Middlesex. Mr. H. T. Wakelam, county architect, Middlesex Guildhall, Westminster.

**HATFIELD.**—Oct. 8.—For erection of offices and building for the county surveyor's department at Hatfield. Particulars may be obtained at the Herts County Surveyor's Office, 41 Parliament Street, S.W.

**HIGH HARRINGTON.**—Sept. 22.—For erection of a dwelling house at High Harrington, Cumberland. Mr. Charles V. Eaglesfield, architect, Gordon Street, Workington.

**HOOLE.**—Oct. 4.—For erection of walling and fencing around the proposed recreation-ground, situate between Canadian Avenue and Bater Avenue, Hoole, Chester. Mr. Arthur D. Caldecutt, clerk, U.D.C., 17 Newgate Street, Chester.

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**HORNSEY.**—Sept. 22.—For taking-down fencing, &c, in Anham Lane, and erecting a new dwarf wall, with iron gates, &c. Mr. E. J. Lovegrove, engineer, Southwood & Highgate, N.

**HOVE.**—Sept. 25.—For repairs to 44 North Road, Hove, ex. Mr. Cook, 53 Elm Grove.

**IKLEY.**—Sept. 24.—For erection of a billiard-room, conservatory, greenhouses, entrance gateway, boundary walls, &c, at Burnside, Ikley, Yorks. Mr. Herbert Jenson, architect, Old Bank Chambers, Bradford.

**IPSWICH.**—Sept. 27.—For alterations to walls, copings and of the swingbridge recesses, and for fixing bearing ke, segment rails, &c, and attending engineers to the fixing of the swingbridge. Mr. Thos. Miller, dock engineer, 100 Fore, Ipswich.

**IRELAND.**—For additions and alterations to Cabra Towers, Ireland. Mr. Henry Hobart, architect, Dromore, Down.

**IRELAND.**—Sept. 23.—For converting present privies into ings and water-closets, constructing and fitting-up a laundry ospital yard, supplying a hot water arrangement, &c, at the khouse buildings, Mount Bellew. Mr. Roderick Halvey, at the Workhouse.

**IRELAND.**—Sept. 23.—The Dublin Corporation lighting nittee invite tenders for erection of an underground former sub-station building in Sackville Street. Mr. icer Harty, city engineer, City Hall, Dublin.

**IRELAND.**—Sept. 23.—For erection of an underground former sub-station building in Sackville Street, Dublin, in ection with the municipal electricity works. Mr. Spencer y, city engineer, City Hall, Dublin.

**KEIGHLEY.**—For additions to Holme Mill, Keighley. rs. John Haggas & Sons, architects, North Street, hley.

**KINGSTON-UPON-HULL.**—Sept. 24.—For erection of two girder railway bridges over Hedon Road, Kingston-upon-one about 70 feet long and carrying four lines of ay, and the other 65 feet long and carrying two lines of ay—for the North-Eastern Railway Company. Mr. ewell, engineer, Dock Office, Hull.

**LEICESTER.**—Sept. 30.—For erection of an octagonal brick ey-shaft 180 feet high at the new generating station, the

Lero. Mr. E. George Mawbey, engineer, Town Hall, Leicester.

**LONDON.**—Sept. 24.—For supplying and fixing new hot-water heating apparatus, &c, to six pavilions, at the Park hospital, Lewisham, S.E. Mr. T. Duncombe Mann, clerk, Metropolitan Asylums Board, Embankment, E.C.

**LONDON.**—Oct. 7.—For erection of a new cartshed, bothy, &c, at Sydenham Wells Park, S.E. Particulars at the General Section (Architect's Department), L.C.C., 18 Pall Mall East, S.W.

**LONDON.**—Oct. 7.—For erection of a refuse destructor. Mr. D. J. Ebbetts, surveyor, 242 High Street, Acton, W.

**LOSTOCK HALL.**—Sept. 24.—For removal of excavation and erection of new carriage shed at Lostock Hall, near Preston, for the Lancashire and Yorkshire Railway Co. Mr. R. C. Irwin, secretary, Hunt's Bank, Manchester.

**LOWESTOFT.**—Oct. 7.—For construction of a timber pier at Lowestoft. Mr. John F. Stovell, secretary to the Coast Development Company, Ltd., 33 Walbrook, E.C.

**MACCLESFIELD.**—Sept. 23.—For construction of a stone staircase and cloakrooms at Church Street school, Hurdfield. Mr. S. J. Aspinwall, secretary, 46 Chestergate, Macclesfield.

**MANCHESTER.**—Sept. 23.—For pointing stonework, making good roof, and other works at Victoria Buildings. Particulars may be obtained at the City Architect's Office, Town Hall.

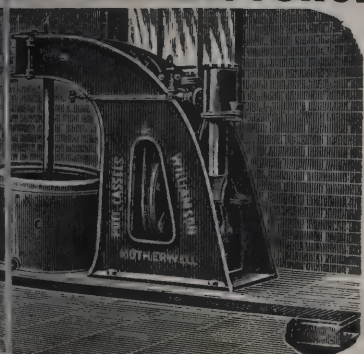
**MIDDLESBROUGH.**—Sept. 24.—For removal of the existing Dent's wharf on the river Tees at Middlesbrough and the construction of a new pitch-pine timber wharf about 235 feet long and 30½ feet in width, for the North-Eastern Railway Company. Mr. T. M. Newell, engineer, Dock Office, Hull.

**MIDDLESBROUGH.**—Sept. 27.—For erection of police station, &c, at South Bank, near Middlesbrough. Mr. Walter H. Brierley, county architect, 13 Lendal, York.

**MIDDLETON JUNCTION.**—Sept. 24.—For construction of bridges, retaining walls, &c, for the widening of the line at Middleton Junction, Lancashire and Yorkshire Railway Company. Mr. R. C. Irwin, secretary, Hunt's Bank, Manchester.

**MILE END OLD TOWN.**—For builders' work at two of the scattered homes for children in the Mile End Road. Mr. William Thacker, clerk, Guardians' Offices, Bancroft Road, Mile End Road, E.

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**PETERBOROUGH.**—Sept. 30.—For construction and seating of a Lancashire boiler, 28 feet by 7 feet, for the electricity works. Mr. John C. Gill, Corporation engineer, Municipal Offices, Peterborough.

**PORTSMOUTH.**—Sept. 24.—For erection of a mortuary with fittings, and of two cast-iron external staircases at the Workhouse, Milton. Mr. G. C. Vernon-Inkpen, architect, Whittington Chambers, King's Road, Southsea.

**RADCLIFFE COLLIERY.**—Sept. 22.—For erection of a new club at Radcliffe Colliery, Northumberland. Mr. George Reavell, jun., architect, Alnwick.

**RICHMOND.**—Oct. 2.—For erection of a dining-hall and laundry buildings at the workhouse. Richmond. Mr. Edward J. Partridge, architect, Bank Chambers, Richmond, Surrey.

**ROCHESTER.**—Sept. 28.—For erection of a stable and harness-room, &c., at St. William's hospital, Rochester. Mr. G. E. Bond, architect, 384 High Street, Rochester.

**SCOTLAND.**—For erection of a villa on the East Terrace, Kingussie. Mr. Geo. Lindsay Legge, architect, Kingussie.

**SCOTLAND.**—Sept. 24.—For supply of water-tube boilers with mechanical stokers and superheaters, and the installation of an induced draught apparatus. Mr. W. H. Tittenson, electrical-engineer, Dudhope, Crescent Road, Dundee.

**SCOTLAND.**—Sept. 24.—For additions and alterations to the central auction mart, Turriff. Messrs. James Duncan & Son, architects, Turriff.

**SCOTLAND.**—Sept. 26.—For erection of town hall and public library at Bo'ness. Messrs. Peddie & Washington Browne, architects, 8 Albany Place, Edinburgh.

**SHEFFIELD.**—Sept. 30.—For supply of 500 poles and 400 bracket arms for overhead line construction for the Sheffield Corporation tramway committee. Mr. A. L. C. Fell, general manager, Town Hall.

**SIDMOUTH.**—Oct. 2.—For erection of an hotel at Sidmouth, Devon. Mr. R. W. Sampson, architect, Manor Offices, Sidmouth.

**SOUTHBOROUGH.**—Sept. 22.—For erection of schools to accommodate 452 children in Powder Mill Lane, High Brooms,

Southborough, Kent. Mr. C. H. Strange, architect, 20 Dud Road, Tunbridge Wells.

**SOUTHPORT.**—Sept. 27.—For construction and erection of a steel footbridge over the Lancashire and Yorkshire Railway at Oak Street, and supply and driving of piles for foundations. Mr. R. P. Hirst, borough engineer, Town Hall, Southport.

**SPAIN.**—Oct. 12.—For works necessary to the installation of a town's water supply. Particulars may be obtained at Casa Consistorial, Fonzaleche, Spain.

**STARBECK.**—Oct. 7.—For construction of a passenger subway under the railway at Starbeck station, Yorks, for the North Eastern Railway Co. Mr. C. N. Wilkinson, secretary, York.

**STOKE-UPON-TRENT.**—Sept. 24.—For conversion of one of the cottage homes at Penkull into ordinary sick wards for children. Mr. C. Lynam, architect, Stoke-on-Trent.

**SUTTON.**—Sept. 24.—For erection of a laundry at the Banstead Road school, Sutton, Surrey. Messrs. Newman Newman, architects, 31 Tooley Street, London Bridge, S.E.

**THORNABY-ON-TEES.**—Sept. 27.—For erection of a new police station, &c., at Thornaby-on-Tees. Mr. Walter J. Brierley, county architect, 13 Lendal, York.

**ULVERSTON.**—Sept. 24.—For alterations and additions to County hotel, Ulverston. Mr. G. Y. McIntosh, architect, Cornwallis Street, Barrow.

**WAKEFIELD.**—Sept. 24.—For conversion of the superintendent's office, the erection of conveniences, weigh office, &c., at the market hall, Teall Street. Mr. Richard Porter, surveyor, Town Hall, Wakefield.

**WALES.**—Sept. 25.—For erection of a mixed school to accommodate 160 children and teacher's house at Bryn, Llanharan. Mr. L. Vaughan Evans, Court House, Pencoed.

**WALES.**—Sept. 26.—For erection of three houses at Penrhiwceiber. Mr. Arthur M. Leon, architect, Cardiff.

**WALES.**—Sept. 29.—For erection of two classrooms and a new lobby for infants' department, the alteration of two classrooms, the erection of four new out-offices, &c., at the Boys' schools, Cwmcarn, Mon. Mr. R. L. Roberts, architect, Abcarn.

**WALES.**—Oct. 6.—For erection of a Congregational church and school at Pontypool. Messrs. Swash & Bain, architects, Midland Bank Chambers, Newport, Mon.

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WALLSEND.—Sept. 27.—For extension of the Carville junior school and caretaker's house, Wallsend. Clerk of the Board, Bewicke Schools, Willington Quay, R.S.O.

WESHAM.—Sept. 30.—For erection of workhouse and offices at Wesham, Lancs. Messrs. Haywood & Harrison, architects, Accrington.

WHITECHAPEL.—Sept. 22.—For erection of stores, cart and sheds, lodge and public urinals at the dépôt in Wentworth Street. Mr. G. W. Clarke, town clerk, 15 Great Alie Street, Whitechapel, E.

WIGAN.—Sept. 24.—For erection of an engine-shed, &c., and widening of bridge at Wigan, for the Lancashire and Yorkshire Railway Company. Mr. R. C. Irwin, secretary, Hunt's Bank, Manchester.

CITY SUBWAYS REGULATIONS.

WITH a view to obviating the constant disturbance of the street traffic, the Corporation has drawn up a number of by-laws which will shortly come into force. In future a company wishing to bring a pipe or wire (other than a service pipe or wire) into a subway must give in writing fourteen days' notice to the Corporation, together with information as to the insulation and the highest electric motive force for which they may be used. Three days before any company can place a service pipe or wire into a subway, notice must be given to the city engineer. Fourteen days' notice must be given by any company of its intention to remove any pipe or wire. In the case of repairs three days' notice will be necessary. No work involving the alteration or reconstruction of any part of a subway will be permitted until the expiration of forty-eight hours after notice has been given to the owner of any pipe or wire in the subway. All companies owning pipes or wires must, within six months of the confirmation of the by-laws, deposit with the Corporation full particulars of their pipes and wires, and in the event of any company failing to carry out the by-laws or supplying incorrect information, it will be liable to a fine of 5*l*., and to a further penalty of 40*s*. for each day during which the offence is continued. Appended to the by-laws is a scale of fees for the execution of certain works in the subways.

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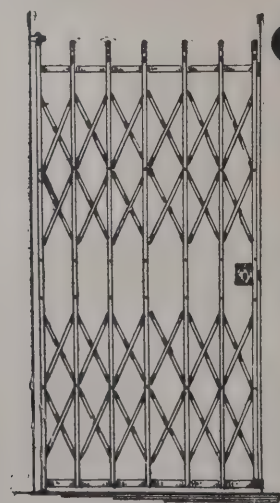
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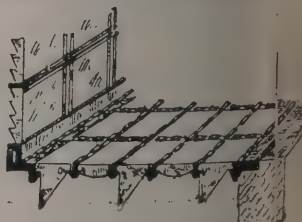
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adshaw & Co. . . . .	2,116	12 11
ASHBY, Mill Road, Lowestoft (accepted) . . . . .	1,658	0 0
erection of Baptist schools, Grove Park, Lowestoft.		
Messrs. G. & R. P. BAINES, architects, 5 Clement's		
inn, Strand. . . . .	£2,040	12 9
Knights . . . . .	1,812	10 0
Welham . . . . .	1,799	0 0
C. Todd . . . . .	1,710	0 0
Elsey . . . . .	1,690	0 0
dwell & Parker . . . . .	1,670	0 0
R. Cole . . . . .	1,466	17 0
E. Earl (provisionally accepted) . . . . .		

MANCHESTER.

erection of an underground convenience (w.c.'s and urinals)		
at Walkden. Mr. JOHN T. PROFFITT, surveyor, Walkden,		
near Manchester. . . . .	£249	17 6
& J. SEDDON, Bolton (accepted) . . . . .		

MARGATE.

sinking a well and working shafts, and driving about		
200 yards of adit at Wingham, about a mile north of		
Adisham railway station, on the main line from Canter-		
bury to Dover, for the Margate Waterworks. Mr. ALBERT		
ATHAM, borough engineer. . . . .	£37,546	12 6
Tilly & Sons . . . . .	26,637	3 8
Cooke & Co. . . . .	26,513	12 10
J. Price . . . . .	22,000	0 0
E. Nunn . . . . .	21,066	18 10
amors & Sons . . . . .	20,000	0 0
F & Miskin . . . . .	19,869	3 0
D. Batchelor . . . . .	17,409	8 0
Smith & Co. . . . .	16,500	0 0
H. Vickers, Ltd. . . . .	9,499	5 4
NGHAM AGRICULTURAL Co. (accepted) . . . . .		

POTTON.

For erection of engine-house, construction of tanks, pumping		
machinery, &c., at Potton, Bedfordshire. Messrs. JOHN		
TAYLOR, SONS & SANTO CRIMP, engineers, 27 Great		
George Street, Westminster, S.W. . . . .	£4,141	0 0
Cross & Cross . . . . .	3,520	0 0
B. Cooke & Co. . . . .	2,932	16 0
J. Wingrove . . . . .	2,919	8 1
J. Jackson . . . . .	2,899	0 0
Ford . . . . .	2,899	0 0
A. G. Osenton . . . . .	2,826	15 0
A. Jewell . . . . .	2,695	0 0
F. J. Bailey . . . . .	2,676	0 0
W. G. Willmott . . . . .	2,649	0 0
A. E. Nunn . . . . .	2,632	13 3
W. Hinkin . . . . .		
J. MOFFAT, 38 Arcade Chambers, Manchester		
(accepted) . . . . .	2,577	18 4

RAWMARSH.

For construction of storm-water sewers and main sewers, with		
manholes, &c., in Aldwarke Road, Parkgate, Rawmarsh,		
Yorks. . . . .	£166	0 0
Green & Co. . . . .	138	15 0
W. H. Trehern . . . . .	115	17 0
R. ALLT, Parkgate (accepted) . . . . .		

ROCHDALE.

For installation of heating apparatus at Marland Hospital.		
I. BUTTERWORTH (accepted) . . . . .		

RYTON-ON-TYNE.

For street works and construction of a culvert, Spen Burn.		
Mr. J. P. DALTON, engineer. Quantities by engineer. . . . .		
Hardy & Atkinson . . . . .	£734	0 8
W. Cumming . . . . .	460	9 4
G. Wells . . . . .	330	15 2
B. Firth . . . . .	270	19 0
M. A. Armstrong . . . . .	259	13 4
A. TENCH, Blaydon (accepted) . . . . .	232	10 1

SCOTLAND.

For repointing the Bridge of Don, Aberdeen. Mr. WILLIAM		
DYACK, burgh surveyor. . . . .		
GALL & WALKER, Richmond Terrace, 11½d. per square		
yard (accepted) . . . . .		

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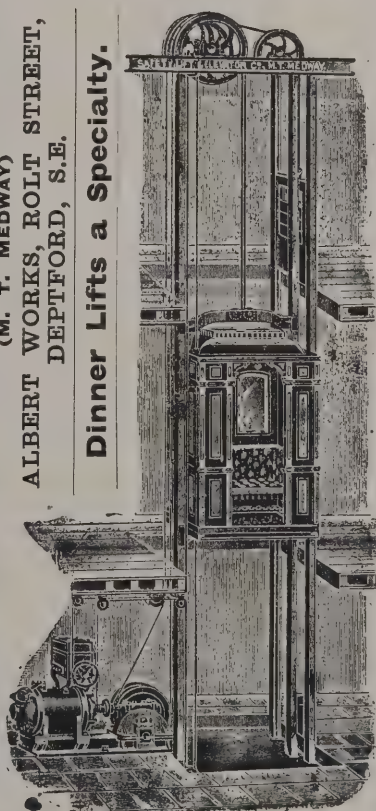
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**LONDON, E.C.**



## SCOTLAND—continued.

For providing and laying about 1,000 lineal yards of 3-inch and 4-inch cast-iron water-pipes in Hurlford and Crookedholm, Kilmarnock. Mr. JOHN STURROCK, jun., engineer, Victoria Buildings, 65 King Street, Kilmarnock.

W. Dow . . . . .	£601	16	9
T. Jack . . . . .	484	7	2
R. Gibson . . . . .	429	10	3
J. Calderwood . . . . .	412	4	3
W. Lawson . . . . .	330	12	11
W. Murchland . . . . .	327	13	8
W. Gibbie . . . . .	287	12	9
T. Wylie . . . . .	254	0	0
A. LUCAS, Hurlford (accepted) . . . . .	243	7	10

## SEAFORD.

For erection of a flint wall 6 feet 6 inches high, with brick piers and gates, on three sides of the isolation hospital site, with an open fence and oak posts on the fourth side.

C. MORLING (accepted) . . . . .	£304	0	0
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## SWINDON.

For roofing the market site, Swindon. Mr. H. J. HAMP, borough surveyor.

## Accepted tenders.

J. Williams, Swindon, buildings . . . . .	£4,447	6	4
Hill & Smith, Brierley Hill Ironworks, iron-work, &c. . . . .	936	3	10

## WAKEFIELD.

For erection of five cottages at Carlton, near Wakefield. BINKS BROS., Outwood, near Wakefield (accepted) £625 15 0

## WALES.

For erection of an English Congregational schoolroom at Bargoed.

J. H. James . . . . .	£948	0	0
F. Davies . . . . .	920	0	0
D. Arthur . . . . .	835	0	0
S. E. THOMAS, Capel Road, Bargoed (accepted) . . . . .	754	10	6

For removal of St. George's pier and the construction of a sea-wall, promenade, &c., and the construction and erection of a pier and floating landing-stage at Menai Bridge.

## Accepted tenders.

A. Thorne, 7 Carteret Street, Queen Anne's Gate, Westminster, S.W., pier . . . . .	£5,949	3	10
I. Evans, Menai Bridge, promenade . . . . .	1,564	5	6

## WALES—continued.

For erection of the Briton Ferry Working-men's club and institute. Mr. H. ALEX. CLARKE, architect, Briton Ferry.

T. Waters . . . . .	£1,472	0	0
L. GOWER, Briton Ferry (accepted) . . . . .	1,295	0	0

For construction of a bridge over the river Lledi, Llanelli (Scheme A) skew masonry bridge, span on square 2 feet arching of brindled brick; (B) timber bridge, three each 17 feet 2 inches, on pile bents. Length of along parapets, 64 feet 6 inches; width of roadway, 24 feet. Mr. J. VAUGHAN STEWART, engineer.

## Scheme A.

G. Mercer . . . . .	£1,090	0	0
M. Dinnie . . . . .	1,060	0	0
W. Morgan . . . . .	900	0	0
B. Howell & Son, Ltd. . . . .	722	0	0

## Scheme B.

M. Dinnie . . . . .	640	0	0
G. Mercer . . . . .	600	0	0
W. Gradwell & Co., Ltd. . . . .	558	4	0
B. Howell & Son, Ltd. . . . .	510	0	0

## WESTBURY-UPON-TRYM.

For construction of an approach road, roads and at boundary wall, railing, fencing, &c., at the cemetery. Mr. A. P. I. COTTERELL, engineer, 23 Baldwin Road, Bristol.

J. Flower . . . . .	£2,459	0	0
Mereweather & Sons . . . . .	1,778	0	0
E. A. Chase . . . . .	1,727	2	0
J. E. B. James . . . . .	1,674	0	0
M. Lovell . . . . .	1,653	0	0
W. & J. BENNETT, 162 Pennywell Road, Bristol (accepted) . . . . .	1,550	0	0

## WEST HARTLEPOOL.

For construction of six additional cells at the refuse depot in Burn Road, to be placed in shed already provided and connected to the existing flue; and the provision of stationary boiler or boilers for raising steam for the electric power station adjoining. Mr. J. W. BROWN, borough engineer, HORSFALL DESTROYER COMPANY, Leeds (accepted).

For erection of hospital buildings in Serpentine Road. WATT BROS., Park Road (accepted).

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## TRADE NOTES.

A Cambridge quarter-chime clock has been fixed at the parish church, Cumberland, by Messrs. W. Potts & Sons. Messrs. Potts & Sons have also received an order to make and fix a church clock at the ancient parish church, Askrigg, Leydale, Yorks, as a memorial to H.M. the late Queen Victoria.

MESSRS. ALFRED GRINDROD & CO., heating and ventilating engineers, of West Street, Sheffield, have recently fixed a hot-water heating apparatus into the greenhouses at The Grange, Sandgate, near Sheffield, for Barber; into the offices of Messrs. Charles Kirkby & Rundel Street, Sheffield; and into Beetwell works and Chesterfield, for Messrs. John Harrison & Son; and the firm have also fitted their high-pressure improved stoves into the offices of Mr. Fred. Cartwright, Sheffield; the new showrooms and warehouses in Bramall Lane, and, for the Exchange Furnishing Company.

## ELECTRIC NOTES.

Bridlington Town Council is applying for sanction to £25,000 for electric-lighting purposes.

The Hythe Town Council have arranged for the introduction of the electric light into the borough.

CKMONDWIKE has received official sanction to borrow for additional electricity purposes.

The Corporation of Brighton are holding an electrical exhibition at the Aquarium; the whole of the available space is booked up.

The Local Government Board's sanction has been obtained for borrowing of £8,478 for building and equipping a new electric-light station in Exeter.

The Monmouth Town Council has decided to extend the mains in Cinderhill Street some 500 yards, and to wire the court and jury room.

Several members of the Lowestoft Corporation visited Hampton on the 16th inst. and inspected the Lorain of electric traction.

MR. P. WHITE, Holyhead Urban District Council engineer, estimates the cost of the electric-lighting scheme of the town at 16,000l., with 750l. for emergencies. As a site for the electricity works some existing steam mills are to be bought for 3,000l., subject to Local Government Board approval.

FOR the new electric tramways at Bexley Heath, Kent, the tenders of the following firms have been accepted:—To supply and lay the cables, the Anchor Cable Company, 8,989l.; for the permanent-way construction, Messrs. J. G. White & Co., 13,829l.; for the overhead equipment, Messrs. Dick Kerr & Co., 4,723l.

## BUILDING AND BUILDERS.

A NEW church is about to be erected in London Road, Worcester.

THE building of a new Grand theatre has been commenced in Norwich.

THE foundation-stone has been laid of a new church at Mallaig, N.B.

HENRY BOWDEN, a steeplejack, of Oldham, fell from a chimney at Radcliffe, and was killed instantly.

THE Ecclesall guardians have appointed Messrs. Holmes & Watson architects to the proposed village homes, and instructed them to submit plans forthwith.

MESSRS. NEWCOMBE & NEWCOMBE, of Newcastle, have submitted to the guardians plans for the rebuilding of the workhouse at a cost of 52,000l. and these have been accepted.

MR. ERIC SUTHERLAND'S (96 Renfield Street, Glasgow) plans for the erection of halls to be used for Sunday-school and other Church work at Larkhall, N.B., have been accepted.

THE Board of Education has sanctioned the loan of 15,641l. for the erection of new schools on the Lodge estate, West Bromwich, and the work is to be commenced forthwith.

AT Sharrow Vale, Sheffield, the foundation-stone of a new chapel has been laid (belonging to the Wesleyan Reform chapel), which is estimated to cost 2,750l.

MR. J. A. SOUTAR is the architect for the reconstruction of the laundry about to be erected at Radcliffe Infirmary, Oxford.

FOUNDATION-STONES of a new Congregational church were laid at Llangollen recently. The new building will cost over 3,000l., towards which sum over 700l. is in hand.

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THE architect for the alterations and additions which are at the present time being carried out at the Royal Pavilion hotel, Woolwich, is Mr. Herbert Riches, of 3 Crooked Lane, London, E.C.

A SCAFFOLD accident occurred on Monday morning at Carlisle Citadel station, by which three workmen sustained injuries so severe that they had to be removed to the Cumberland Infirmary.

It is expected that within a short time the work of restoring the ancient chapel of St. Nicholas in Carisbrooke Castle, Isle of Wight, as a memorial to Charles I. will be commenced. The plans have been approved by the Government department responsible for the care of historic buildings.

THE foundation-stones of a new Primitive Methodist Sunday school in Leigh Road, Leigh, Lancs, were laid on the 13th inst. The chapel, which has been in course of erection for some time, and the Sunday school, which will accommodate 700 scholars, will cost about 7,500*l*.

ON the 13th inst. the memorial-stone of the new Established church for Dalmaur, N.B., was laid by Colonel Denny, M.P., provincial grand master of Dumbartonshire. The church is designed in a free treatment of Perpendicular Gothic, and will cost about 5,000*l*. It will have accommodation for about 800 worshippers.

A NEW church is to be erected at Sparkhill, Birmingham, the suggested name of which is St. Giles's, Springfield. The scheme is somewhat immature at present. No plans are prepared, the only definite facts that may be stated are the absolute necessity of the building and its situation. It will stand on half an acre of land in a conveniently central position at the terminus of the Sparkhill tramway route. The actual site is at the corner of Walford Road and Springfield Road, opposite the new College Road Board schools.

A TERRIBLE accident occurred on Tuesday afternoon to a party of seven joiners who were engaged on the construction of a cooling tank at the large new electricity generating station of the South Lancashire Tramways Company at Atherton, near Bolton. The men were working on a timber staging 38 feet high, and whilst moving a derrick crane an accident occurred which caused the collapse of the scaffold, precipitating the men into a concrete bed 44 feet below. George Pearce, twenty-two, single, Liverpool, was picked up dead, and of five removed to the Bolton Infirmary two died almost immediately. Only one man escaped.

THE London County Council housing of the working classes committee held a special meeting on the 16th inst., when the report of the architect, presenting working drawings, specifications, &c., regarding the blocks of dwellings to be erected on the Clerkenwell Road and Leather Lane frontages of the Reid's Brewery estate was considered. A statement was made by the chairman of the action taken by him during the recess. A letter was also read from the Home Office criticising the plans of the dwellings proposed to be erected by Lord Portman on the Nightingale Street area.

At a recent meeting of the St. Helens water committee the water engineer, Mr. J. J. Lackland, raised a point of interest to plumbers. A Bolton plumber applied for permission to do work at St. Helens and said he was prohibited by his operatives' society from employing a St. Helens man on the work. He had to send his own workmen. Mr. Lackland said the question was whether the water committee too were to be bound by the rules of the operatives' society. The matter was adjourned for inquiries, the chairman remarking, in answer to a question, that if a St. Helens plumber wished to do work in another town he would have to gain the necessary permission.

At a special meeting of the Barnsley School Board the result of the competition amongst local architects for the erection of a new higher elementary school was made known. Nine architects competed, and the Board were assisted in coming to a decision by the architectural adviser to the Leeds School Board. Mr. Ernest Dyson, of Kingstone Place, was the successful competitor, and his plans will be submitted to the Board of Education for final approval. The first prize of 25*l*. was won by Messrs. Dixon, the second of 15*l*. by Messrs. Crawshaw & Wilkinson, and the third of 10*l*. by Messrs. Moxon & Sons. The Board also decided to apply for powers to borrow 1,350*l*. for the erection of a temporary iron school, for use until the new school is completed, and for street making.

THE York City Council having applied to the Local Government Board for sanction to borrow the sum of 4,400*l*. for the extension of their Fever Hospital site, Huntington Road, an inquiry, directed by the Local Government Board, was held by Mr. R. W. Johnston, M.D., one of the Board's inspectors, in a committee-room at the Guildhall, York, on the 8th inst. The amount of 4,400*l*. was for the purchase of land from the Crown, and included 400*l*. for fencing. There was no opposition save



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that of Dr. A. J. E. Parker, who objected on the ground that in cases of infectious diseases patients should not be sent to a large hospital if they could be attended at home, as the assemblage of many under one roof was liable to spread infection by the air, and of Mr. T. Wilson, an old ratepayer, who complained of the Corporation's continual borrowing. At the close of the inquiry the inspector visited the proposed site.

A SAD accident occurred on Friday afternoon at the Tay Bridge, Dundee. A number of painters were engaged on the structure painting the high girders. To do this they had to stand on a car which ran on rails. Boisterous weather prevailed, and the inspector, fearing that an accident might result, gave orders to the gang to cease work. This was done, but before the men had time to leave a terrible gust of wind struck the car, sending it with great speed along the line. Frantic efforts were made by the men to stop the vehicle, but without success, and the wheels leaving the metals the men were thrown off. Alexander Falconer and William Howie fell into the river 80 feet below and were lost, but the others saved themselves by catching hold of different parts of the bridge, and escaped with minor injuries.

BETWEEN three and four o'clock on the 15th inst. there was a very serious accident at the Carlisle Corporation gasworks. The roof of the retort house, which is over 60 yards long and about 30 or 40 yards broad, and was supported by iron girders, suddenly collapsed while about thirty men were employed in the building. Two men who were working on the top of the retorts were seriously injured. Robert Gilliland (who was one of those who was injured in an explosion at the gasworks about three years ago) fell, and a

large portion of the roof fell on and around him, breaking both his legs. A slate caught Archibald Turnbull on the head, and inflicted a long, gaping wound. Both the injured men were taken to the County Infirmary. It is supposed that the accident was caused by the heat of the retort ovens gradually eating the strength of the girders away. Recently a system of water gas was installed, and this, together with the present supply in the gasometers and the electric light, will be used for the lighting of the town.

AT the last meeting of the Burton Town Council a lengthy discussion took place on a report by Sir George Livesey on the subject of gasworks extension. The gas and electric-light committee unanimously recommended that the work as advised by Sir George be carried out at the estimated cost of 53,000*l.*, but that only one section be entered upon immediately at an outlay of 36,000*l.* This was eventually agreed to, an amendment to again defer the matter pending further and more detailed information being lost by nineteen votes to five. In the course of the debate it transpired that the gasworks during their existence had made 170,750*l.* profit, and of that sum 116,900*l.* had gone directly to the relief of the rates. The works had cost 192,000*l.*, and at the present time the mortgage upon them was only 43,000*l.* It was announced that Mr. Robert Ratcliff (Bass, Ratcliff & Gretton) had approved the plans for the Turkish baths which he is presenting to the town at a cost of 2,500*l.*, and it was decided to proceed with their erection forthwith.

## VARIETIES.

AT St. Michael's Church, Coppenhall, the new lady chapel was dedicated on Saturday afternoon.

AN addition which has been made to St. Stephen's schools, Elton, Bury, at a cost of 1,000*l.*, was opened on Saturday.

APPLICATIONS for the appointment of sanitary inspector to the Corporation of London will be considered on the 29th inst.; there are two vacancies.

AS an experiment the Halifax Rural District Council intend to treat the sewage of Norwood Green on the bacteriological system.

THE new school for infants, erected at Wednesfield by the Wednesfield School Board to accommodate 230 children, was opened on Tuesday last.

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Single Ply ...	£1 : 11 : 0	£0 : 17 : 0
Double Ply...	1 : 16 : 6	1 : 0 : 0
Asbestos ...	2 : 16 : 6	1 : 10 : 0

Bales containing 500 square feet each; half-bales 250 square feet. Weights: Single-ply, 80 lbs.; Double-ply, 120 lbs.; Asbestos, 190 lbs. per bale.

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CLERK'S offices, a new board-room, an out-relief office and a new receiving home for children will shortly be erected at Hammersmith Mr. J. H. Richardson, of 87 Finsbury Pavement, London, E.C., is the architect.

THE London County Council are seeking an architectural assistant for the Housing of the Working Classes section of the Architectural Department. Applications must be made by 29th inst

MEMBERS of the Surveyors' Institution who are interested in the formation of a Masonic lodge, to be restricted to members only, are invited to communicate with Mr. T. H. Mellor, F.S.I., 1 Laurence Pountney Hill, Cannon Street, E.C.

GRAFTON SQUARE Congregational church, Clapham, was reopened on Sunday after being closed for several weeks for renovations, the cost of which, including alterations to church buildings, amounts to nearly 2,000l.

THE Temple Church, which has been closed during the Long Vacation, will be reopened for service on Sunday, October 5. During the Vacation the electric light has been reinstalled and considerably augmented.

ON Tuesday afternoon the new refrigerator which has been erected in connection with the city abattoir at the North Circular Road, Dublin, was formally opened by the Lord Mayor in the presence of a representative gathering of the citizens.

AFTER undergoing renovation, necessitating an expenditure of upwards of 700l, St. John's Church, Derby, was reopened for public worship on Sunday. The interior of this antique church now presents an exceedingly bright and cheerful appearance.

AT Southend on Saturday the Countess of Warwick formally opened the new technical schools which have been erected at the junction of the London Road and Victoria Avenue, from designs by Mr. H. T. Hare, F.R.I.B.A. The cost of the building, which forms a handsome and conspicuous block, has been about 20,000l.

THE exhibition of drawings executed by competitors in the recent municipal buildings competition was opened in the Co-operative Hall, Crewe, on the 16th inst., under the auspices of the Town Council. Forty-four sets of drawings were sent in, the first prize being awarded to Mr. Henry T. Hare, London. The second was divided between Messrs. Banister Fletcher & Son, London, Mr. Albert E. Dixon, of Leeds, and Messrs. Rodway & Denning, of Bristol.

THE Victorian Wesleyan Sunday and day schools in Grecian Crescent, Bolton, having become inadequate to the requirements of the district, were pulled down a year ago to make room for more commodious buildings, the memorial-stones of which were laid on October 12, 1901, and the new schools were formally opened on Saturday last.

DURING the height of the storm which raged at Walton-on-Thames on Friday last the stables belonging to the Urban District Council, situated at the Crutchfield Lane depôt, were struck by lightning and set on fire in two places. The ridge of the roof was demolished for a space of about 6 feet, the rafters were blackened, and in the centre of the building the electric fluid passed right through the roof and splintered one of the principals into matchwood.

WEST DEREHAM Church, Norfolk, was opened after restoration on the 11th inst. A new roof in pitch pine has been provided, and forms the chief feature of the restoration work. The walls and gables of the nave, which must have been in a dilapidated state, suffered considerably from the fall of the roof, which took place on April 25, 1901. These have been rebuilt. A new floor of Staffordshire tiles and wood blocks has been laid, and new seating in pitch pine erected in memory of a parishioner. A special apparatus for heating the building has also been installed. The total cost of the work amounts to about 850l. In addition to the work already undertaken, the tower remains to be repaired, the bells to be rehung and the tracery of the windows to be restored.

THE opening ceremony of the Lewin Road Baptist church, Streatham, S.W., took place on Saturday afternoon last, when the building was formally opened by the Mayor of Wandsworth. The building is of the Decorated Gothic period, and has a bold square tower and spire at one side. The facings are of red brick and the dressings of white Costessey work. The roof is of hammer-beam construction of open timberwork with boarded ceiling. The contract amount was 3,033l, exclusive of seating. The work has been carried out by Messrs. Johnson & Co., Wandsworth Common, from the designs and under the superintendence of Messrs. G. & R. P. Baines, architects, 5 Clement's Inn, Strand, W.C.

ST. JAMES'S HALL, Regent Street, has been subjected to a course of furnishing which amounts almost to a transformation, and the old gloomy scheme of decoration has given place to one which is bright and cheerful. The gallery and balcony fronts are picked out with light green and gold. The arch over



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the orchestra is being decorated. New and roomy fauteuils have been provided, while the comfort of the gallery folks has been considered, and this portion of the house has been entirely resealed. A new system of ventilation has been adopted, and new windows have been fixed in light stained glass, ornamented with the names of eminent composers. The alterations, which have been in progress since last July, have been effected under the personal superintendence of Mr. Walter Emden, the architect.

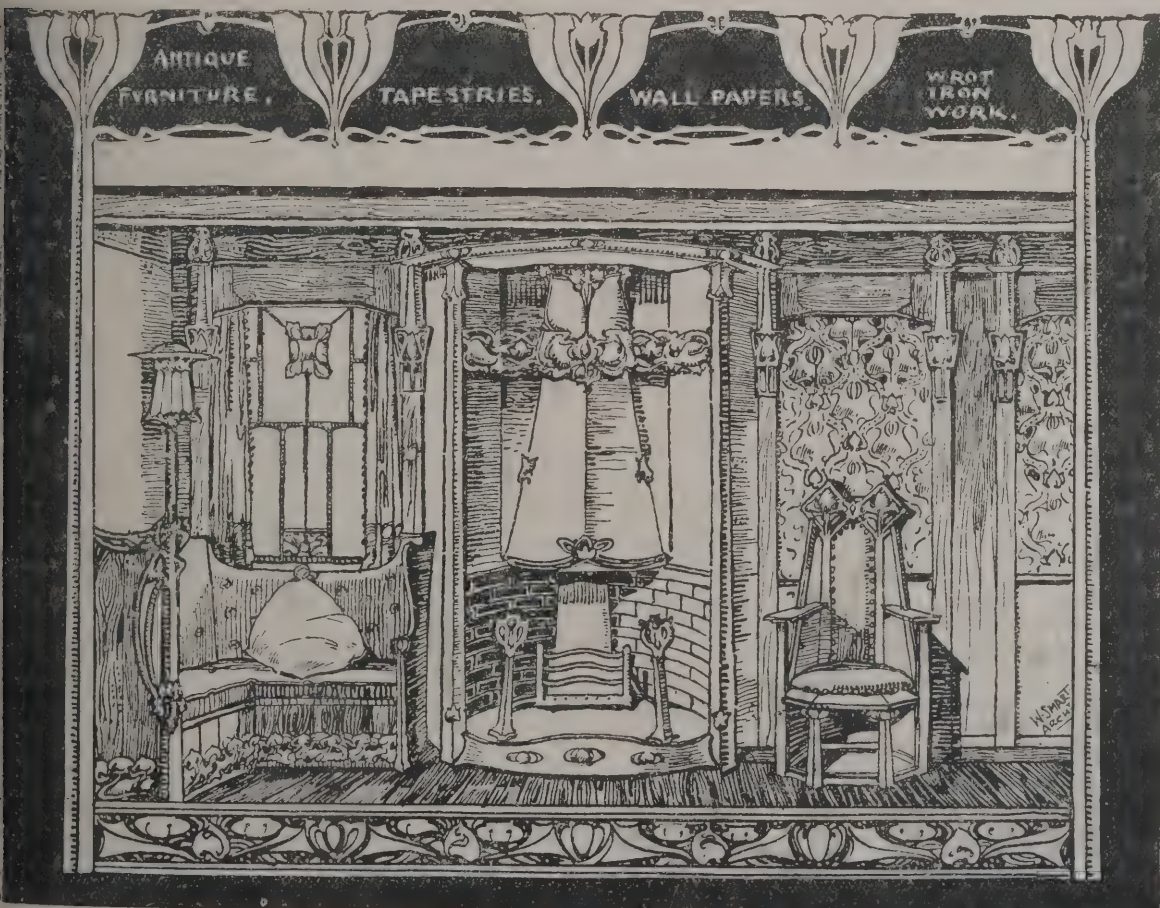
THE urgently required restoration of St. Matthew's Church, Duddeston, has been carried out under the guidance of Mr. D. Arkell, architect, of Birmingham, and the reopening service was held on Sunday. The tower and spire have been repaired and strengthened, and the interior of the church has been improved. The system of gas-lighting is now effective, the north, south and west gallery fronts have raised decorations in the panels, the east wall has been specially treated, and the sanctuary screen has been continued round the north and south walls.

SOME interest has been excited in Southport by the announcement of the negotiations for the purchase of the Victoria Hotel vaults by the Corporation at 5,000*l.*, as a great public improvement will be effected by the purchase, and an opportunity afforded for dealing with the front on a much more extensive scale than has hitherto been the case. The present slope to the Lower Parade from Nevill Street will be filled up and a magnificent approach to the Promenade constructed. The ground close to the present bridge and the promenade adjoining the lake will also be placed on a higher elevation, and when the pier entrance is thrown back a fine large open square will be formed.

THE first annual report of the Stepney Borough Council has just been issued, and from it we learn that when the Council took office it took over three schemes under the Housing of the Working Classes Act, which were in progress in different parts of the borough. The first of these was what is known as the London Terrace scheme, St. George's, which was estimated to cost the defunct vestry of that parish the sum of 2,717*l.* The two other housing schemes were both in Limehouse, Queen Catherine Court, where the net cost of acquiring land was 5,574*l.*, and on which the Council is about to erect houses, and the King John's Court, where the net cost is estimated at 13,492*l.* Towards this, however, the London County Council have contributed 5,800*l.* In the matter of improvements the Council has been still more active,

THE new church at Twechar, N.B., was opened on Sunday. It occupies a position adjacent to Twechar school-house. The seating accommodation of the church is for 440 worshippers. The main entrance porch occupies, with the staircase, the ground floor of the tower. The heating is conducted from a heating chamber, situated in the basement, immediately under the chancel. The manse has its accommodation entirely on the ground floor, and consists of dining-room, study or parlour, three bedrooms, kitchen, scullery and wash-house and bathroom, together with a sufficiency of storage space. All the rooms are of ample dimensions. Both church and manse are fully lighted by electricity. The exterior design of the church is in the Early English Gothic style, tending towards the transition between this style and the Early Decorated style of Gothic work, and the manse, though more plainly designed, is still completely in harmony with the church. The whole edifice is built of Closeburn (Dumfriesshire) stone, which, in the case of the church, is dressed inside and out. The church has an open roof, designed to match the general style of the buildings. Arrangements have been made for the addition of a gallery should such extension of accommodation be rendered necessary by the increase of congregation. The grounds are enclosed in front by a wrought-iron railing of good design, surmounting a stone parapet wall which is pierced by two gates, while the lighting of the entrance is provided for by the placing of two pillar lamps just in front of the main gable.

A NEW police court was opened at Sparkhill, Birmingham, on Monday last. Sparkhill, says the *Birmingham Post*, has since October 1, 1899, been under the administration of the Worcestershire County Council. Soon after the Chief Constable of Worcestershire took charge of Sparkhill a police-station with cells was built on the Stratford Road, opposite the Women's Hospital. It was originally intended to add a court-house over the cells, but this part of the scheme was allowed to stand over for a time, and the entertainment hall of the Sparkhill Institute was used for the petty sessions as a temporary arrangement. The authorities having decided to provide accommodation at the police-station for five unmarried constables, the space over the cells has been utilised for the building of four bedrooms, a bath-room and a lavatory. A mess-room and kitchen have been provided on the ground floor. The court-house has been built behind the police station, with a carriage entrance and courtyard on the Stratford Road side, and a public entrance from Court Road.



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On one side of the public entrance is a solicitors' room, and on the other a witnesses' waiting-room, with sanitary arrangements. Behind the Bench is a retiring-room and a lavatory for the magistrates, communicating with their private entrance. The court is a fairly large, lofty and well-lighted building, 45 feet by 27 feet. It is simply but suitably fitted up, the only feature calling for comment being the dock. This is very small, and it is placed against the wall, between one end of the Bench and the door leading to the courtyard and the cells. There is a seat for the dock officer, but it was evidently not made to hold the sergeant who was on duty when the court was opened. There is ample accommodation for the Press and the public. The low-pressure system is used for heating. The work has been carried out by Mr. Frank Davis, of Moseley, under the direction of Mr. A. B. Rowe (acting county surveyor) and Mr. E. T. Fletcher (clerk of works).

### THE SANITARY INSTITUTE HEALTH EXHIBITION.

FOLLOWING upon our notice in last week's issue of the above exhibition, which remains open at St. James's Hall, Manchester, until the 27th inst, we now proceed to give a few comments on some of the exhibits bearing more or less on the important subject of sanitation, and it is generally conceded that, taken altogether, the exhibition is one of a very instructive character, being on that account well worthy of a visit on the part of the vast numbers who are interested in matters relating to health, from both far and near.

Messrs. Doulton's exhibit embraces a large variety of sanitary fittings, and amongst the closets those for works and schools are especially noticable. One pattern consists of separate basins connected to one pipe fixed below ground level. They are flushed by an automatic tank, so that at one discharge the whole range is cleared. The action is syphonic and each basin is isolated. There is also a special low closet for children on the wash-down principle, with syphon cistern. These can be fitted with seat-action arrangement if desired. A syphonic closet, certain and quiet in action, with a good water area, as well as a new valve closet with open overflow, are also on view. For drainagework a new automatic syphon is shown. This will work with liquid sewage as well as clear water, and acts with drop-by-drop supply. The baths

are of different designs, and include both ordinary plunge as well as shower and spray fittings. They are all vitreous enamelled inside, and in one or two instances outside as well. This insures a perfectly smooth, glossy and lasting surface. Strong white-glazed fireclay is used for most of the lavatories, sinks, urinals, &c., and especially for those included for hospital use. It is strong, lasting, and has a smooth and well-glazed surface, and in many cases the ironwork used with it is vitreous enamelled, so that all exposed parts can be washed down. A mortuary-table attracts attention. The slab is 6 feet 6 inches long by 2 feet 6 inches wide, dished and deeply grooved to one end. It is fixed on a vitreous-enamelled centre column arranged to move on ball-bearings, so that the top can be easily turned to any angle, and then retained in that position by means of a simple check fitting. Another speciality is the sink for infectious hospitals. One pattern is worked by treadles, another by self-closing valves.

Messrs. Fletcher, Russell & Co., Ltd., of Warrington, clearly demonstrate the advantages of the "Hurst" patent pipe-joint, which has received a bronze medal award, for every class of pipes, &c., and connections. It can be fitted to baths, lavatories, sinks, kitchen and back boilers, as well as all kinds of taps, cisterns, mains, &c., wherever required, and should prove invaluable to water and gas companies, manufacturers, hydraulic engineers, shipbuilders and the general public. The same firm also show the rapid water-heater for baths, which comprises some novel features that are deserving at least of attention and worthy of a trial.

Mr. E. R. Palmer, Hygiene Works, Wickham Road, Beckenham, Stand 6, has an interesting exhibit consisting of automatic flushing syphons, automatic alternating apparatus for the distribution of sewage, and a ventilating column fitted with water fan, for which he obtained a bronze medal. This is an adaptation of mechanical ventilation or forced draught to the ordinary ventilating columns for sewers, and overcomes the weak point that has been hitherto such a strong argument against their use by the opponents of the system, by the atmosphere at certain times acting as a seal and preventing the gases escaping. In these columns an air fan is operated by a small water-wheel, which is driven by water taken from the main supply through a pipe passing up inside the base of the column, which extracts the foul air from the sewer, having a velocity of about 20,000 feet per hour through a 10-inch diameter up-shaft. The waste water from the fan can be used again for filling a flushing tank fitted with his

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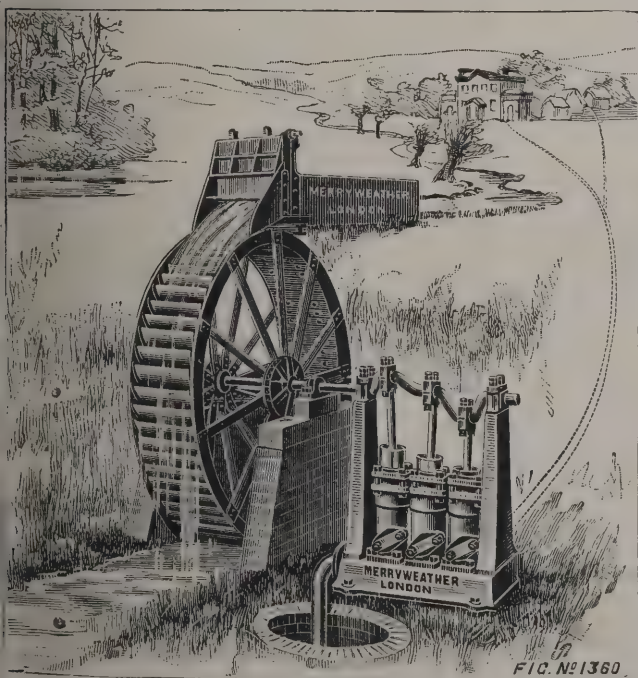
automatic syphon for flushing the sewer or for dissolving disinfectants. These flushing syphons are supplied to suit all systems for sewage purification and give a powerful flush with a certainty of action, but are specially useful when used in connection with the ventilating columns fitted with water-wheel, as the water after doing its duty there is conveyed into a storage tank which is periodically flushed out by the syphon, thus insuring a complete and continuous flushing of the sewer. These syphons are made in different patterns with outlets varying from 4 inches to 60 inches, the C pattern being designed to meet the difficulty of flushing shallow sewers, and are shown working satisfactorily in a flushing chamber with a depth of 12 inches only, with instantaneous action on a drop-by-drop supply. Pattern D is for flushing house drains and Pattern E for flushing drains without extra water, receiving waste water from baths and discharging with great force. They are specially suited for hospitals, asylums, &c. Alternating apparatus for the distribution of sewage can be attached to the outlet of these syphons. Mr. Palmer also exhibited other sanitary specialties, including patent trough channel with trap for receiving the ends of waste pipes from baths, sinks, &c.

*The Adamant and British Opal Wall-Glazing Co., Ltd.*, of Birmingham (Stand 51), are well to the front with their several specialties, including, in the first place, plastering waterproof cement, the merits and adaptability whereof are now pretty generally recognised. A satisfactory demonstration is afforded too of fireproof construction both as regards flooring and partitions, while "Britopal" is deserving of a more than ordinary share of attention, inasmuch as it is now extensively adopted as a substitute for glazing bricks or tiles by reason of its more artistic appearance and greater durability, added to the fact that the cost, we understand, compares in its favour.

*Messrs. Mather & Platt, Ltd.*, Salford Ironworks, Manchester, Stand 68.—This is a most important exhibit, consisting of the firm's specialties dealing with the purification of water, the treatment of sewage, water softening apparatus, fireproof doors, fire extinguisers, valves, hydrants, &c. The purification of water by means of Reeves's gravity filters (of which one is shown having a capacity of 125,000 gallons per twenty-four hours), and the treatment of sewage by automatic appliances, dealing with it from the outfall until it is distributed over the bacteria beds, we dealt with very fully in describing Messrs. Mather & Platt's exhibit at the last Glasgow Exhibition, but we briefly re-enumerate them, the subjects and their mode of treatment both being of sufficient importance to warrant it.

In the Reeves system for purifying river and well water for town supply and domestic purposes there are two forms of filters, the "compound" and "single-contact," operated by gravity or pressure. In the first the process of purification is effected by four distinct operations, namely, centrifugal separation, upward straining, aeration and downward filtration, the other by downward filtration only. The unfiltered water is taken through an automatic control valve into an annular separating chamber, and when it has filled this, rises through the primary filter, overflows through an inner chamber, and passes down to the finishing filter, and through screened nozzles at the bed of the filter, and then conveyed by pipes to the central duct, and thence to the outlet. The filtering medium consists of pure quartz crystals, which owing to their high specific gravity is not diminished by any portion of it being carried away with the water treated. The cleansing of the filters is a simple process, effected by reversing the flow of water, and requires a proportion of 1 in 400 only of the quantity passed through for filtration, and occupying from five to fifteen minutes to complete. These filters are in operation at many waterworks and private residences, hotels, &c., and have been adopted by many corporations with satisfactory results, as the analyses we have before us prove. In dealing with the subject of sewage purification, Messrs. Mather & Platt have set themselves the task of devising a means by which the bacteria beds shall be fed at regular intervals and in definite quantity, and that each bed should have regular intervals of rest and sufficient for them to recover before receiving the next discharge. This they secure in the following manner:—When the sewage or water in the sedimentation tank rises to a certain level a portion of it flows through a pipe into a chamber containing a float-tank, consisting of an upper and lower holder, connected with a flap valve. When the upper half is full its weight is sufficient to slightly open the valve, through which the fluid passes into the lower half, the extra weight causing the valve to become fully opened, and the sewage rushes into the next chamber, which is provided with a number of outlets corresponding to the number of bacteria beds. These outlets are controlled by means of flap-valves, which are opened and shut automatically and in rotation by the revolution of a shaft carrying arms, which catch projections at the top of the valves, causing them to open, the arms being so arranged round the revolving shaft that when one valve is opened the one previously in action is closed. The revolving shaft is connected with a ratchet wheel,

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actuated by the movement of the float-tank in filling and emptying, which by this operation turns the shaft sufficiently to release one arm and to bring another into contact with the next valve. The speed at which it works depends upon the sewage itself, for if the flow be heavy the float rises quickly; if slight, slowly, and of course at the same rate turns the shaft. After the sewage has passed the outlets it flows into Ridgway's automatic distributor, which consists of spreaders of open troughs with perforations along the bottom of one side of each, hung from an iron standard and so balanced that friction is reduced to a minimum; a small head causes it to revolve at a speed which is easily regulated. Messrs. Mather & Platt were awarded a silver medal for their water-softening apparatus, a bronze medal for their feed-water filter, and a bronze medal for their automatic distributing and flushing valves, and their gravity filter is selected for further consideration.

Messrs. Wilson & Stockall, Bury, inventors, patentees and manufacturers of all kinds of ambulances, have for their exhibit both a brougham and an accident ambulance. Taking the brougham ambulance first, we may here mention it was purchased on behalf of the city of Birmingham, where four of them are already in use. It is designed for removing infectious cases to isolation hospitals, and every care has been taken in designing and building to render it thoroughly suitable for that purpose. In appearance it resembles, when closed, an ordinary private brougham. For opening to receive or discharge a patient the whole of the back swings open on hinges, and to keep it securely fixed and wide-open is secured automatically by a catch. It is fitted with a portable stretcher running on a grooved frame, which is extended beyond the body of the carriage when the stretcher is being replaced or removed, and folds up inside the door at back when not required. There is ample room inside for the attendant, and a locker contains everything that would be required in an emergency for the patient, and the windows are filled with glass which, while allowing the patients to see clearly through them, prevents them being seen by passers-by. Should the patient not require to lie down, the frame and stretcher can be instantly removed, and it can be used as an ordinary four-seated brougham. The great feature of the accident ambulance is the easy provision for ingress and egress, being hung so low on a cranked mail patent axle of superior quality that a patient can be placed in position with the greatest possible ease, and owing to a particular mode of adaptation of the springs any jolting or

uncomfortable motion is reduced to a minimum. It contains two stretchers: (1) which is slung and runs in on a folding frame, with an ingenious arrangement for raising and lowering; (2) the bottom stretcher is furnished with rubber-tyred wheels, springs and axle (easily detachable), and can be used to run the patient along the floor, or can be carried up and down stairs. We gather from Messrs. Wilson & Stockall's excellently got-up catalogue, which will be found very useful for reference, that they have recently supplied ambulances to the following among other cities and towns besides Birmingham:—Belfast, Bradford (three), Brighton, Glasgow, Halifax, Hull, Manchester (five), Montevideo, Oldham (three), Scarborough, Sheffield (two), York.

A most interesting exhibit is that of *William E. Farrer*, 36 Cannon Street, Birmingham, Stand 75, where numerous new features are shown. We noticed particularly a new urinal made from a material called "Torfit," a specially prepared, highly disinfectant composition, by which urine coming in contact with it is rendered innocuous and deprived of noxious smells. With proper cleansing and an occasional coating of all exposed surfaces with a patent "Torfit" extract, it remains impervious and efficient for any length of time. The material is formed of slabs made in suitable sizes for the backs, ends, divisions, channel and floor treads. Besides being in itself economical in first cost, it effects a great saving of water for flushing purposes, which is a point greatly in its favour. The latest form of flushing syphon is also shown, and engineers and surveyors will find that many of the difficulties experienced, through leaky joints and consequent loss of compression are overcome. It embodies in one casting all the hitherto loose parts essential for effective working, its improved shape increases the velocity of the discharge, the chamber in which the syphon is placed is completely emptied owing to the improvement in the compression pipe, and the trap cannot be unsealed during or after discharge. The vent-pipe at the outlet relieves any back pressure and forms a means of charging up the trap after fixing. There are no flanges to bed, thus avoiding the danger of a leakage at this point, and it will work with drop-by-drop feed and with sewage or clean water.

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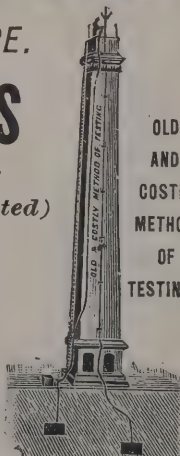
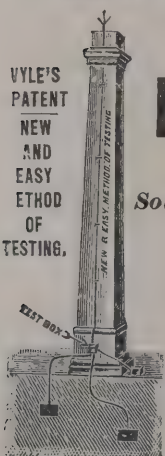
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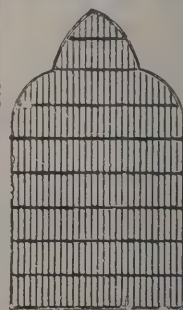
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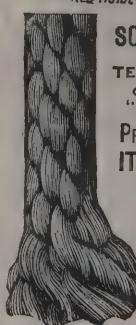
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or shelf varying from 7½ inches to 15 inches in width. A bronze medal has also been awarded for this, a very neat improvement in lavatory basins. The Farrer patent "bead-rim" was shown and also secured a bronze medal. This bead-rim by its shape effectually prevents water splashing and consequent wet floors, no matter how high the incoming pressure or how great the oscillation. There is no danger of an accumulation of soap or dirt under the rim, but it is both clean and sanitary, and can be adapted to every form of washing apparatus.

Messrs. W. Harriman & Co., Ltd., of Newcastle-on-Tyne, have a large and varied exhibit of well-made sanitary goods comprising white glazed sinks and lavatories in various patterns, as well as urinal channels, to suit different requirements. An example of the Standard access system of drainage is also shown, consisting of access pipes, bends, junctions and traps, by the use of which expensive manholes are avoided, while the system can at any time be easily inspected and rodded if necessary without disturbing the ground. An interesting feature is also Harriman's branch channel blocks for manholes, for receiving branch drains through adjustable pipe bends, whereby concrete surfaces are dispensed with and a better appearance obtained. Noticeable, too, among other good things are access pipes, bends, junctions and traps for easily inspecting and rodding drains without breaking the pipes, and the Union adjustable stoneware street gully, which is designed to meet the requirements of the Local Government Board and possesses distinct advantages. At the spacious stand of Messrs. Harriman & Co., Ltd., may be noted, moreover, an intercepting chamber showing the application of Barron's patent channel-bends, besides samples of Barron's improved rain-water shoes, patent interceptor, anti-foul gully-traps and adjustable disconnecting traps with air-tight access covers for inspection and sweeping, all of which are well deserving of attention.

Messrs. Meldrum Brothers, Ltd., show a model of the top-feed "Simplex" destructor furnace in conjunction with a steam generator of the water-tube type. The furnace, it will be noticed, forms one continuous cell or chamber, the grate being in three divisions, each of which is charged or clinkered alternately with the other divisions, whereby part of the grate is always in a white and hot incandescent state, thus insuring the maintenance of a very high and uniform temperature in the furnace and combustion chamber, whereby all noxious fumes are thoroughly cremated, and any risk of

nuisance obviated. The capacity of this furnace is, we understand, from 40 to 50 tons of refuse per day of twenty-four hours, while the boiler evaporation is equal to from 450 to 600 gallons per hour net. There is also shown a destructor model of the front-feed type, the design and method of working being the same as the preceding, except that the refuse is fed into the furnace at the front instead of from the top of the cells. Messrs. Meldrum exhibit in addition the "Koker" stoker (Meldrum's and Clayton's patents), which is applicable to all types of boilers and furnaces, suitable for machine firing, besides bars of a special type, designed to minimise the cost of repairs.

Messrs. Ewart & Son, Ltd., of Euston Road, London make a good display of their well-known geysers (bronze medal award), to which gas and water supplies are connected, showing how rapidly hot water may be obtained. The latest and most interesting pattern is the "Califont," which is designed to supply a constant stream of hot water at the rate of 8 gallons per minute, under a pressure, equal to that of the cold-water supply, to any number of taps on the same or different levels. This firm also show a number of improved cast-iron porcelain and metallic enamelled baths, with nickel-plated bath-room fittings and bath seats, together with several radiators, including the "Euston," which gives an even, constant heat, and is in itself complete, requiring merely a small gas supply to be attached, and to be filled with water when first placed in position.

One of the best displays of the exhibition is that of Messrs. Shanks & Co., Ltd., of Barrhead, Glasgow, whose specimens of cast-iron porcelain-enamelled baths, for which the silver medal has been awarded, and fittings, are of a very high character. Their new patent bath fitting designed for Hollymoor Asylum, near Birmingham, is compact, reliable, non-concussive and easily manipulated. The arrangement too is a very safe one, as cold water must be turned on first from "shut;" afterwards comes the tepid and then the hot, the supply being controlled by a loose key, which remains in the possession of the attendant. The waste tap outside is quick and accessible, while there is nothing that can be interfered with by the inmate, nor any projection by which he can inflict self-injury. Specially deserving of notice also is Shanks's patent surgical lavatory, with improved pedal action for hot and cold water, brought together into one combination, thus mixing the water, while only one pedal is used. Another noticeable lavatory is actuated by a lever at



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the side, which is moved by the elbow or knees. There are in addition other interesting forms of surgical lavatories and fittings, besides several of Shanks's well-known patent closets, such as the "Unus" combination w.-c., the "Levern" siphonic closet with regulating valve supply, and the "Modern" closet, with float-valve cistern.

*Messrs. George Howson & Sons, Ltd.*, of Hanley, show a surgeon's lavatory for operating theatres, with pedal apparatus to operate taps and waste, besides a post-mortem operating table on pedestal, with ball bearings and slop pan, waste pipes and channel. Besides other things we also noticed a range of three serviceable lavatories and urinals, in addition to several closets, including the Motolite wash-down, the Clifford patent syphonic, the Paxton and the Rivolite wash-down water-closet, all of which present a good appearance.

*The Hard York Patent Stone Company*, of Halifax, exhibit laid sections of their nonslip hard York stone flags, which form a capital footway paving that is being used by over 350 public bodies and corporations throughout the country. The colour and foothold are similar to natural hard York stone; it has a fair surface, square edges the full depth, even thickness, and regular sizes, whilst experience has shown that it never becomes slippery. It is made by pressure, not by hand, and being of so fine a texture it can be coped to any size or shape far more readily. Shortly, it combines the best qualities of the hard York stone with all the advantage of a manufactured stone ready for laying, and forms an admirable material for footway paving, steps, landings, &c. The "Nonslip" stone, which has been awarded the bronze medal, is moreover, admirably suitable for window and door heads, sills, jambs and mullions, square and moulded steps, landings, coping, water tabling, decorative panels or any purpose for which an artificial stone can be used.

*Messrs. Sessions & Sons, Ltd.*, of Cardiff, exhibit several enamelled slate and marble mantelpieces and fire grates on approved hygienic principles, newly designed, besides enamelled glass swing and other signs artistically executed, together with some very good specimens of marbled glass for panelling and dadoes. Interesting models are also shown of slate sinks and tanks, in addition to urinals, slabs and fittings.

*Mr. Vernon Parker*, of 20 Victoria Street, Westminster, makes a prominent display of Hamblet's blue-brick ware, including bricks of various kinds, such as ordinary building, stable, kerb, channels, plinths, bull-nose copings and other forms, together with specimens of Duffy's Acme wood flooring,

and of Jarrah red gum, as well as deal paving blocks. Other exhibits comprise the Howatson filter, Hassall's improved patent safety pipe joint, for which the silver medal has been awarded, and a demonstration of the Shone system of ventilation of drains and sewers, which is applicable to old and new town sewerage works or to the ventilation of the drains of mansions, hotels, hospitals, barracks, &c.

*Messrs. Oates & Green, Ltd.*, of Halifax, make a capital display of various sanitary appliances, including the "Isolt" latrine, which is specially designed for school and institution work where absolute isolation is necessary, and the patent lavatory spray for schools, designed to allow a continuous or intermittent flow of water. Examples, moreover, are shown of the salt glazed patent taper urinal and the enamelled patent "Wyvern" urinal, together with the "Kroyvert" waste water-closet, all of which have admirable features and apparently well answer their purpose, besides the salt-glazed manger which has been awarded the bronze medal.

*The Cannon Iron Foundries, Ltd.*, of Bilston, Staffs, who have been awarded the silver medal for enamelled cast-iron, show an assortment of baths and sanitary ware in "porceliron," including the "Britannia," embodying the latest improvements from a sanitary standpoint, and the "Edwardian" bath with supply valves in the foot end. There are also good specimens of lavatories, besides the "Achilles" water-closet, the Bedford urinal and an assortment of the usual patterns of plug bowls, &c., together with a drinking fountain and some very serviceable gas-cooking stoves.

*The British Sanitary Company*, of Bothwell Street, Glasgow, exhibit specimens of their self-acting earth closets (silver medal award) in white and yellow pine, as well as pitch pine and oak. These new and improved earth closets may with confidence be recommended to architects, builders, sanitary engineers and the public generally as the most perfect appliances of the kind yet produced. The advantages comprise (1) the simplicity, strength and perfection of the mechanism; (2) the effective distribution of the deodorising material; (3) the large capacity of the magazine containing the deodorising material, and (4) its very moderate price. A noticeable feature, it may be added, is the perforated shovel which acts as a spreader, whereby certain action and equal distribution are alike secured.

*Messrs. Outram & Co.*, Excelsior Potteries, Woodville, near Burton-on-Trent, Stand-81, are to be congratulated on the success of Hassall's patent water-closet, of which they are the manufacturers, it being awarded, after severe tests, a bronze

7 PALL MALL, S.W.

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medal, and receiving considerable attention. On each occasion while being tested the complete contents of the pan, whether paper, dish-cloths, coloured water, shavings, &c., were entirely flushed out, in no case requiring a second flush, and this by the use of  $1\frac{1}{2}$  gallon of water only, which we were informed is guaranteed to be sufficient in all cases. The style, quality, designs and flush of the various sanitary articles exhibited by Messrs. Outram & Co., such as water-closet pans, lavatory basins, urinals, basins, sinks, &c., deserve high commendation, and an inspection of them will prove both profitable and interesting.

*The Ames-Crosta Sanitary Engineering Company, Ltd.*, Nottingham, Stand 93, have a good display of the sanitary specialties for which they are well known, and also some of the more recent introductions. One of the latter, and which obtained a bronze medal, is Ames's patent stoneware conduits for electric cables, that externally resembles an ordinary drain pipe, but internally is divided by partitions into any required number of cable-ways, and has at the invert a suitable space left as a waterway to drain away any water or moisture that may find a way into the conduit, a sufficient space being allowed between the partitions at the joints to permit any leakage to fall into the invert, thus insuring the cableways being kept dry. This company received also a bronze medal for Crosta's patent surface water gully, having a complete double trap, perfectly sealing sewer gases.

A main feature at the stand of *Messrs. J. Duckett & Son, Ltd.*, is the highly-glazed amber-coloured ware for which the firm is well known; closets and urinals of this ware are set up in full working order. Messrs. Duckett also show several good specimens of white-glazed ware, including urinals, lavatory basins and channel blocks for manhole chambers; the largest shown of the latter is 3 feet by 2 feet, and is in one complete piece of ware. We understand that the firm is now executing an order for a large number of these blocks of larger and smaller sizes than given above for an extensive scheme of drainage reconstruction for the Rochdale Union, at the Dearnley warehouse, the engineers for the work being Messrs. Radcliffe & Chadwick, of King Street, Manchester. A new and much improved form of isolated syphonic closets in ranges is shown, and the well-known "Clencher" wash-down closet. Urinals with a new form of ware duct and spray are also exhibited; this new addition prevents splashing on the floor of the urinal. A very excellent specimen of red brickwork is, moreover, shown, built in connection with the setting up of

several working exhibits; the bricks, of first-class quality and splendid colour, are the production of the Huncoat Plastic Brick and Terra-cotta Company, Ltd., Accrington. The skilful arrangement of the exhibits is well worthy of notice.

The merits of the "Eclipse" patent glazing, which in addition to being watertight and dustproof gives the maximum amount of light, are very effectively displayed by the well-known firm of *Messrs. Mellows & Company* (bronze medal award), who have glazed most successfully a large number of electric lighting stations and power houses, for which the system is specially suited, in numerous places throughout the kingdom, and who, besides having recently completed the reglazing of Carlisle Citadel station, the Central Transept, Crystal Palace, and a large number of stations, &c., on the Great Central Railway, are at present engaged, we understand, on various railway and other works to the extent of about a million feet superficial or more, thus proving the high appreciation in which the system is held throughout the length and breadth of the land.

The importance of ventilation is now pretty generally recognised, and some attention is due to the Offa ventilator, shown by the *Offa Ventilating Company*, which consists of a frame secured in the wall, with opening through the same, and admits clean air in any position; absolutely, it is said, without draught.

The *Crystalline Company, Ltd.*, exhibit crystalline tiles, a new product manufactured from porcelain opal, with a "key" back to enable it to adhere perfectly to cement, so as to be adapted for covering walls, ceilings, lavatories, &c., and to form a sanitary wall tiling for hospitals. Samples, too, are shown of Verre-sur-Verre, a decoration on crystalline tiles, produced by using layers or casings of glass super-imposed upon the tiles.

The connection between health and the laundry is apparent to all, and therefore attention may well be directed to the high-class, modern laundry machinery exhibited by *Messrs. W. Summerscales & Sons, Ltd.*, of Keighley, for which the silver medal has been awarded, including the patent "Practical" and the "Challenge Renown" washing machines, which are made entirely of metal, and fitted with all the latest improvements, besides the patent automatic reversing motion and locking gear. Then there is the "Majestic" ironing and finishing machine of the Decouden type, embracing new features and modern improvements, which give it a first place in the market. We noticed also the "Electric" suspended hydro-extractor, made to be driven by

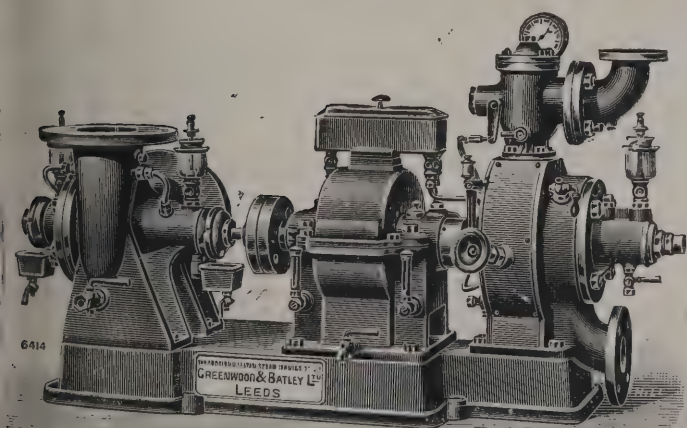
# GREENWOOD & BATLEY, LIM.,

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#### MOTORS and DYNAMOS.

DE LAVAL'S PATENT STEAM  
TURBINE MOTORS,  
TURBINE DYNAMOS,  
PUMPS and FANS.



No. 6414, DE LAVAL PATENT STEAM TURBINE PUMP.

SEND FOR CATALOGUES.



an electric motor designed to run at constant speed whether the cage is full or empty, while the whole machine is suspended on three pillars, making itself balancing and requiring no foundation.

"Mezotil," the ideal sanitary wall and ceiling covering, which has received the bronze medal award, is shown to much advantage by the sole manufacturers, the *London Tablet Company*, whose works are at Sydenham, S.E. The material consists of enamelled and decorated large zinc sheets, which have met with much approval for inside decorative purposes, especially where light, cleanliness and durability are essential requirements. The joints between the sheets are scarcely perceptible, and they may be underlined where it is desirable or necessary to get an absolutely hermetical water and steam-proof ceiling or wall. The material offers one unbroken, level, china-like surface, without raised points, ridges, or crevices for dirt and dust to settle in, and it can be easily and reliably cleaned. It is absolutely flexible, so that it will bend into and around the sharpest angles without cracking the enamel, while the lightness is a further advantage, as among other things the thin material secures a safe adhesion to the covered surfaces, and with a mastic so powerful as "Mezotil" cement, renders almost impossible, at the back of the covering, the formation of cavities. It is further claimed that "Mezotil" is the only material with which an absolutely damp-proof, hermetical and sanitary ceiling can be procured. We may add that over 120,000 square feet of "Mezotil" have just been supplied to the new Waverley Station hotel at Edinburgh for walls and ceilings.

The *Sanitary Block and Tile Pavement Company, Ltd.*, of Victoria Street, S.W., make a display of their sanitary block paving, which, owing to its freedom from expansion and contraction, is considered specially suitable for tramways, and it has consequently been laid in a large area of the Cardiff Corporation Electric Tramway system, also at Great Yarmouth, Nottingham and elsewhere. These blocks are made from Trinidad Lake asphalt mixed with crushed trap rock or other suitable material, each block being subjected to a very high pressure. The company have their paving in use in various London streets, and have supplied nearly 40,000 yards to the British Westinghouse Company's new works at Trafford Park, Manchester. Samples are also shown of sanitary paving blocks made from destructor refuse, as well as samples of a new improved thoroughly sanitary silent block, for which distinct advantages are claimed.

*Messrs. James Stott & Co.*, of Oldham, Manchester, make an efficient display of the "Stott" patent instantaneous water-heater. The apparatus consists primarily of a mixing cylinder or chamber filled with gravel, and to this supplies of cold water and steam are connected. By means of the gravel in the cylinder the cold water is broken up into its constituent molecules before coming into contact with the steam, and when afterwards the water mixes with the steam, thorough combination takes place. The steam condenses, gives up its heat to the cold water, and from the cylinder a continuous stream of hot water flows forward direct to the bath or where it may be required. Its temperature can be regulated to any degree with the greatest precision. Each heater is complete with special water and steam valves for connecting to their respective supply pipes. There is also shown the "Stott" water-heater ("safety" pattern), which is specially adapted for baths at public institutions, more particularly workhouses, asylums, infirmaries, &c. Further exhibits comprise the well-known "Stott" gas-bill reducer for checking pressure and otherwise reducing gas consumption; roof and ware inlet ventilators; together with the "Stott" electric ventilating fan for removing smoke and foul air from rooms, as well as for ventilating hotels, theatres and other public institutions, &c.

Among the various exhibits of *Messrs. J. Defries & Sons, Ltd.*, are the Equifex disinfection appliances, including a scale model of the improved saturated steam disinfectant, which has been awarded a silver medal, for absolute disinfection (Metropolitan Asylums Board type), with automatic recording gauge controlling the duration and sufficiency of each operation. We noticed also the "Equifex" disinfectant cleanser, an appliance which enables water from a main water supply to be automatically mixed with an exact proportion of disinfectant, antiseptic or deodorant solution. The automatic working of the apparatus has been found, in the disinfection of public streets, markets, abattoirs, &c., to effect a saving, we understand, of 80 per cent. on the cost of labour, and the complete utilisation of the disinfectant effects a still further economy.

The *Septic Tank Syndicate, Ltd.*, of Exeter, make a demonstration of their system of purifying sewage by natural means, including full-size alternating gear for two filters, suitable for filters of 100 to 200 square yards, full-sized gear for small installations, combining sprinkling distribution with contact in bed, and samples of filtered effluents. Photographs are also shown of installations which are of simple construction and



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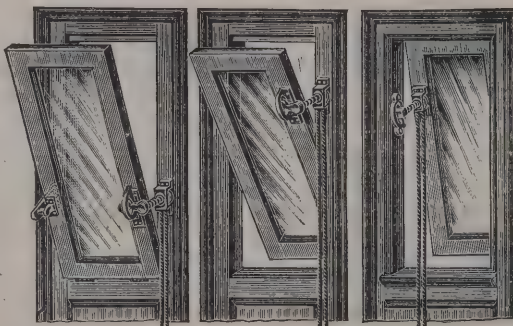
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Brass, Iron Shoot.	Iron Back Plate.
2 in. 5/6	2 in. 6/-
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3 " 6/9	3 " 7/6
3 1/2 " 7/6	3 1/2 " 8/6
4 " 8/6	4 " 9/6
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per doz.	per doz.



#### THE "INVISIBLE" FANLIGHT OPENER (CARTLAND'S PATENT).

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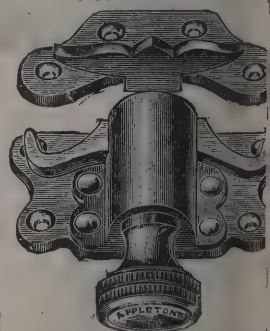
Hinged at Bottom, Opening In.  
Brass 1751 4/6  
Iron 1752 3/3

For Pivot Sashes.  
Brass 1755 4/6  
Iron 1756 3/3

Hinged at Top, Opening Out.  
Brass 1753 4/6  
Iron 1754 3/3

The advantages of this invention will be appreciated by Builders, Architects, and others, as being a perfect Fanlight Opener, without the disadvantage of any unsightly part projecting into the room, to the impediment of blinds, &c. It is equally suitable for sashes hung at top, bottom, or pivot sashes.

#### THE "GRAPPLER" PATENT SASH FASTENER (Appleton's Patent.)



8380. 18/- per dozen. Strong machine-made, Polished. A turn of the knob causes the Grapple to clutch the catch-plate and securely locks the sashes. It lifts up and draws close together dropping sashes.

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Single Action.	5755 Iron.
3 in. 15/-	
4 " 22/-	
5 " 28/-	
5756 Brass.	
3 in. 30/-	
4 " 42/-	
5 " 54/-	
per dozen.	



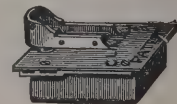
Double Action.	5753 Iron.
3 inch, 4/-	
4 " 6/-	
5 " 8/-	
5754 Brass.	
3 inch, 6/6	
4 " 10/-	
5 " 13/-	
per pair.	



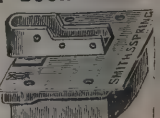
#### PATENT HELICAL, CLIMAX, ADJUSTABLE AND RELIABLE DOOR SPRING



5355 Iron.	356 Brass.
4 in. 21/-	4 in. 35/-
5 " 28/-	5 " 45/-
6 " 36/-	6 " 55/-
	per dozen.



2401 With 2-in. Shoe, 16/6 each.



2860 With 2-in. Shoe, 23/6 each.

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entirely automatic in action, consisting of (1) septic tanks in which all organic solids are liquefied and the formation of sludge avoided, and (2) automatic aerating filters.

The disposal of house refuse is a problem which has occupied the attention of many cities and towns during the last few years, and therefore the models shown by the *Horsfall Destructor Company* of their patent refuse destructor, "back-fed" and "top-fed" types, cannot well be allowed to escape observation, having received the silver medal, while the model of the refuse "Horsfall" patent centrifugal dust-catcher is equally entitled to consideration, as well as the photos and plans of plants erected in various parts by the company.

We have only room just to briefly mention, in addition, the following exhibits, several of which are deserving of a longer notice:—

*The Exhibit and Trading Company*, Liverpool.—Model bath-room completely fitted, porcelain bath and lavatory, with nickel-plated fittings.

*Slack & Brownlow*, Corton, near Manchester.—The Brownlow germ filters.

*Sanitas Company, Ltd.*—Kingzett's patent drain tester, "Sanitas," and other disinfectants in various forms.

*Burn Bros.*—Patent drain and gully plugs, bag stoppers, and "Eclipse" smoke machines, &c.

*Wilson's & Mathieson's, Ltd.*, Leeds.—Gas fires, boilers, stoves, together with gas appliances for domestic and other purposes.

*Brookes, Ltd.*, Halifax.—Specimens of Norwegian non-slipping granite setts and Myddleton macadam, as supplied to Leeds, Halifax and most of the leading corporations throughout the country.

*Hope & Sons.*—Disinfectant blocks for sewers and water-carts, together with various disinfectants.

*United Newry Granite Company, Ltd.*, Manchester.—Samples of grey granite paving setts from various quarries of the company in Newry, as supplied to the principal large towns.

*Tyler & Co.*, Coventry.—Tyler's automatic draught regulator and smoke preventer for land and marine boilers and other furnaces.

*Matthews & Yates*—Ventilating gas-stoves for heating purposes, also electric and other blowers for ventilation and refuse collecting.

*J. Oakes & Co.*, Alfreton.—Glazed stoneware pipes and fittings.

*R. Ravenor*, Newbury.—Ravenor's patent drain-tester.

*Jeyes's Sanitary Compounds Company, Ltd.*—Samples of Jeyes's fluid disinfectant, sanitary powder and pine-oil blocks for use in urinals and water-carts.

*Worrall & Co.*, Liverpool.—Fireproof door for the prevention of the spread of fire from one compartment to another; Bostwick collapsible gate, also wrought-iron gates.

*The Fireproof Plate Wall Co., Ltd.*, Manchester.—Sound-proof and sanitary fireproof partitions (Bruckner's and other patents), also samples of "Euboeolith" patent sanitary jointless floor.

*Day's Automatic Waste-Water Closet and Sanitary Pipe Syndicate, Ltd.*—Samples of specialties, also channels, bends, gullies, &c.

*G. B. Wilson*, Brierley, Yorks.—Patent gully dredger for cleaning out gully and interceptor traps, drains, &c.

*Newton, Chambers & Co., Ltd.*, Thorncliffe, near Sheffield.—Samples of "Izal" disinfectant fluid, powder and other preparations.

*C. Wills & Sons*, Bournemouth.—Specimens of Wills's patent joint for connecting ware and metal pipes, as applied to ordinary pedestal closets, and of Wills's patent junction.

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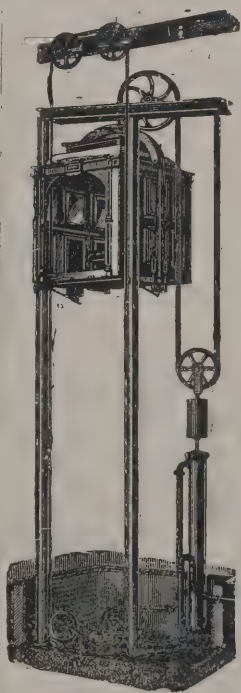
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### BUILDING REGULATIONS IN TORONTO.

THE loss of the lives of several firemen at a recent fire in a warehouse in Toronto has served the useful purpose of focussing public attention upon the necessity for proper inspection of buildings, and the adoption of building regulations suited to modern requirements. Nothing short of a disaster of this kind, says the *Canadian Architect*, would apparently cause the City Council to move in the matter. The Ontario Association of Architects and the Toronto Architectural Eighteen Club have jointly addressed a communication to the Council as follows:—That the architects of the city, understanding that it is proposed to reorganise the City Commissioner's department, believe that it would be to the city's interest that a committee of architects should be consulted in reference to the appointment of a city architect and the revision of the building by-laws. While the architects are of the opinion that it is exceedingly important that the very best man obtainable should be appointed as head of the building department, they think that for the designing and erection of the more important city structures better and more artistic results may be obtained by employing architects of known ability. The architect or engineer in charge of the building department should be thoroughly competent to judge of the stability of the most complex structures, with ability to calculate strains and stresses, and with a thorough knowledge of all kinds of building materials and processes. The chief concern of the architects, however, is the thorough revision of the building by-laws.

The building by-laws committee of the Toronto Chapter of the Ontario Association of Architects spent a large amount of time some seven years ago preparing a set of by-laws which were then presented to the property committee, and which, after one or two meetings for their consideration, were quickly shelved.

About eighteen months since the Toronto Architectural Eighteen Club also entered into correspondence with the property committee regarding the revision of the building by-

laws, after having obtained information regarding building by-laws from some six or eight American cities, and with no more tangle results.

It has been for many years a fact patent to all interested in building operations that the building by-laws are entirely behind the times and out of date, while some of the most usual and modern methods of construction are not even hinted at.

Among the latter may be mentioned steel cage construction, fireproofing in various forms and cement mortar in substitution of lime mortar, giving stronger walls with less thickness.

Many abuses have crept in through the by-law permitting flimsy additions to buildings by means of so-called mansard roofs, which are practically wooden buildings, having a slope of but a few inches from the perpendicular, while they are just as inflammable as any other wooden building.

Some of our largest buildings in the first-class fire limit are thus topped-out, and the license to use such a hazardous method of building is a menace not only to adjoining property, but the city at large.

An ordinance should be framed regulating the frontage line of buildings, especially in residential districts. There is scarcely a residential street in the city which is not marred, and the value of property adversely affected by the non-observance of a common frontage line.

An ordinance should also be framed to protect the owners of residential property from the incursion of shops and business places. The value of whole sections has been seriously reduced, and the character of the neighbourhood changed or lowered by the facility with which a shop may be introduced into a first-class residential block, and without any corresponding advantage to the residents.

There are many other matters which should receive immediate and careful consideration, if our city is to be kept abreast of the times. To accomplish these objects, we would respectfully suggest that your Board accept the offer of a committee to assist in putting the by-laws in satisfactory shape.

The Toronto Board of Trade has appointed a committee of its members to look into the matter of the building by-laws with a view to assisting in bringing about their much needed revision.

It is to be hoped that before the recollection of the recent disaster shall have faded from public memory, public sentiment will compel the Council to deal in a definite way with this important subject.



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# The Architect.

## THE WEEK.

WITH the exception of Messrs. AUSTIN & PALEY, the list of competitors who are to take part in the real competition for the Liverpool Cathedral does not correspond with any of those which were prepared by architects who assumed the office of judges. Disappointment will no doubt arise, especially among the would-be prophets. There might, perhaps, be a stronger body of combatants, but so many of those nominated have shown ability in minor actions, they may be glad to prove themselves doughty in so important a struggle. The reputation of Liverpool was to some extent at stake, but the only local architect who has gained the distinction of honourable mention is Mr. JAMES H. COOK. The executive committee retain the right of inviting an architect or architects to submit designs and plans in the final competition, and the majority of architects throughout Great Britain would, we are confident, be glad to learn that Mr. COOK, as the representative of Liverpool, was allowed an opportunity of another effort under definite conditions. Each of the architects who will take part in the final competition will receive 300 guineas. The honorarium of the advisory architects was 500 guineas each. The discussions which were raised, and which it is to be hoped will not be renewed, did not aid in increasing the subscription list, but the promises of contributions amount to 154,114*l.* 16*s.* 3*d.*, and of that sum 71,646*l.* 14*s.* 11*d.* has been received.

In the address which M. BESNARD, as president of the international jury of the Turin Exhibition, delivered at the banquet last week, he called attention to the efforts which were made in France and England for the elevation of the workmen. He ascribed the work in England to "a noble pleiad of artists" who devoted themselves mainly to the furnishing of dwellings. In France it was the National Society of Fine Arts, aided by some generous writers, that founded an independent section for art workmen in the salons. Their example was followed in other countries, and the workman had become, he said, not only an equal but a confrère of painters and sculptors. They wished that clever workmen should cease to be anonymous, as was desired by manufacturers. They endeavoured to persuade the latter to assume the rôle of MÆCENAS, and among other things to found medals to reward workmen who were exhibitors. The efforts to individualise the workmen were only partially successful, but M. BESNARD was hopeful that in time there would be a more general co-operation.

MR. G. D. LESLIE, R.A., is not satisfied with opposing the reconstruction of the Sonning bridges; he has obtained from his brother, Sir BRADFORD LESLIE, who has been engaged in bridge-building for forty years, some advice about timber bridges. It is as follows:—"As to bridges, of course, masonry or brick-arched bridges are the best and most economical, because they are practically imperishable. Timber comes next; timber bridges properly designed are as strong as steel. If timber is burnettised with bichloride of zinc under pressure it becomes non-inflammable. BRUNEL's timber viaducts on the Cornish Railway carried the traffic for forty years, and many of them are still in existence. Timber bridges are half the price of steel; if the saving be invested at compound interest the accumulated fund would pay for the renewal of the timber from time to time as required, and still show a large economy as compared with steel. I might almost add that timber is safer than steel; a steel pillar or strut is liable to collapse by a blow, especially when under strain, and let down an entire span; timber will give or yield and recover its form. Steel is liable to corrosion in ungetatable places, and the damage may go on until the bridge collapses; this was the case with the Hastings suspension bridge at Calcutta." It is not good policy to exaggerate the advantages of timber for bridges. BRUNEL employed timber because wrought-iron was not in use at the time. There are few timber bridges to be found on English railways unless where they span roads or streams in out-of-the-way places. In America also where timber viaducts of most ingenious varieties were set up they have

been superseded by steel bridges. Cast-iron columns may succumb to the impact of a great force, but the steel piers and columns which are now constructed are not in much danger. Timber bridges can be made to assume picturesque forms, and on that account they may have their use in positions like Sonning. But experts will not agree with Sir BRADFORD LESLIE that they are to be preferred on account of their strength and endurance.

THE Lord Chamberlain and the London County Council are justified in taking all reasonable precautions against fires in theatres. It cannot be concealed that the arrangements for coping with this danger in London are inadequate, for not only is there a possibility of apparatus failing but, as lately happened in Queen Victoria Street, the firemen with all their bravery may be momentarily deprived of that aptitude for adapting means to ends which is necessary when lives are at stake. It is more prudent to rely on the structural character of the theatres, and to enable them to be safe when emergencies arise there should be continual attention. But the precautions could be easily adopted without any ostentatious display of watchfulness on the part of officials. At the present time it is not agreeable to hear statements which are enough to make nervous people unable to give all their minds to what is done on the stage. Managers have cause to complain about the creation of doubts as to the safety of their property. They have also cause to be dissatisfied with the want of uniformity in the orders which are given and through which alterations made in one year may be condemned in the following season. An Association of London Theatre Managers has been formed, and at the first meeting it was announced that their interests are identical with those of the public, and they were willing to do everything to diminish the risk of fire. But they ask that they should be exempt from the vexatious and possibly unreasonable demands of an ever-changing body. They are ready to pay all the costs of a permanent Government department attached to the Lord Chamberlain's Office or to the Home Office, where by the aid of experts a continuity and uniformity of administration would be secured. With a Government office of that kind little possibility would exist of creating panics. The supervision would not be by fits and starts, and the alterations called for need not be magnified into demands for the entire or partial demolition of the building. Theatrical managers have vast responsibilities in order to provide for the safety of the public. There is no necessity, and, indeed, no right to have it suggested that they are indifferent to the preservation of their property, for with a well-constructed building the alterations or precautions which are ordered ought not to be excessive in any one year.

THREE men were killed last week by the collapse of a crane at the Soothill Quarry near Dewsbury. At the inquest which followed, Mr. PICKERING, the chief inspector of mines and quarries in the district, said the crane appeared to have been well adapted for its work. The cause of the accident was the collapse of the foundation on which the footstone was resting. The mortar contained sufficient lime, but either the lime was not freshly slacked or properly mixed, or the stone had been fixed before the mortar had set, for there was no adherence between stone and mortar. When mortar is in such a condition it is more of the nature of a lubricant than a binder. Mr. AKEROYD, the managing director, in his evidence said that the mortar used at the quarries was composed of South Elmsall lime and river sand. Instructions were always given to mix the mortar in the proportion of one of lime and three of sand. Mr. AKEROYD could not account for the difference in the samples of mortar produced. The Coroner said that there must have been some mistake or carelessness, but on the whole there was an absence of criminality. The jury returned a verdict that the men met their death accidentally from the collapse of a crane, in the fixing of which improper mortar had been used. The disaster is evidence of the danger which is often lurking unseen in mortar, but owing to the covering escapes attention. Tile floors have occasionally to be taken up owing to a similar defect. As the work is limited in extent, labourers endeavour to evade the trouble of preparing the mortar with the care which is demanded when operations are on a large scale as in a building.





PAINTERS' ARCHITECTURE: CLAUDE.

### VASARI AND EVOLUTION.

WHEN in the middle of the sixteenth century GIORGIO VASARI began his famous *Lives of the most eminent painters, sculptors and architects*, there was a tendency among men to look backwards rather than forwards. The Church, which was the dominant power, always referred to the decline in fervour among Christians. The standard of primitive confessors was supposed to be almost unattainable. Political reformers had what might be called an ideal before their imagination in the ancient condition of Italy. The numerous petty states and the continual broils between them were compared with Imperial Rome, in which not only unity and greatness, but happiness existed. All who considered contemporary events in Italy were disposed to exclaim with RIENZI, who lived in the fourteenth century, "Where are now the old Romans, their virtue, their justice and their power? Why was I not born in those glorious days?"

In the case of art there were some grounds for believing that the skill of men was not strengthened by revolving years. In Florence, where VASARI lived, masterpieces of ancient sculpture were to be seen. The first edition of the *Lives* was dedicated to COSMO DE MEDICIS, whose family had enriched the city with invaluable examples of antiquity. However he might esteem his contemporaries or the Florentine artists of a preceding generation, VASARI could not fail to realise that the excellence of antiquity had not been reached. On the other hand, patriotism and the natural instinct by which artists consider their own age as entitled to respect and their own works deserving of patronage must have convinced him that improvement was not at an end, and that under certain circumstances Italy, and especially Florence, would be able to produce masterpieces worthy of the appreciation of the judges of a later time.

We have therefore in VASARI the optimist and the pessimist. He was a man of simple faith, and he believed that art resembled human life, and as men were born and in course of time attained maturity, then declined into the lean, and slippered pantaloons and finally passed away, art also was decreed to ascend towards perfection from humble beginnings, to subside into decadence, and lastly to become degenerate. There was a prevalent opinion then, as in earlier and in later ages, that the world was approaching its end, and VASARI acknowledged his ambition was to exercise an influence through his own writings about great artists which would be sufficient to keep men from the lethargy which was usually the beginning of the end. He expressed the hope that artists and patrons would be alike benefited by his biographies. Frankly he owned that the labour he had spent on gathering materials for his work and writing it was unrewarded, and he therefore expected that the Duke of FLORENCE and his relative, JULIUS III., the Pope, would not only recompense the biographer, but also protect the poor but clever men who were pursuing different branches of art.

As we have said, VASARI was at once hopeful and desponding; or, in other words, he believed in the advance of the arts and in the liability of a return to barbarism. He seemed to have a vision of evolution when he suggested that the CREATOR set an example to painters and sculptors by continually adding to or diminishing the form of man, as if it were at one time a plastic and misshapen model. That was a doctrine which at the period must have surprised many students of philosophy. It should be remembered that in VASARI'S days the early history of ancient art was based on inferences from passages in the Bible, as well as on statements of historians who were supposed to see the marvellous in whatever belonged to a former age. Thus BELUS, the son of NIMROD, who lived 200 years after the Deluge, was stated to have caused the preparation of the first statue. In Florence, if one of the MEDICIS demanded a remarkable painting or piece of sculpture the artists would have been emulous to obey. They were, however, artists who had gone through a long course of preparation. But VASARI did not ask himself how the competence was acquired which enabled the command of BELUS to be carried out, and which could only arise from the practice of several generations of men. Manifestly he was rather confused in attempting to deal with the origin of art, as when he says that the idols stolen by RACHEL from her father were imitations of some of the statues which SEMIRAMIS had ordered. There was no archaeologist in the sixteenth century to suggest that RACHEL'S strange gods, which were buried under the oak at Shechem, were symbolic rather than representative, and had none of the qualities of a work of art. VASARI is, however, careful to point out that idolatry consisted in the worship of graven figures and not in their formation. He was too religious a man to admit that even the suspicion of a censure of one of the arts was to be traced in the Scriptures.

He accepted the theory that the art of the Greeks was derived from the Ethiopians through the Egyptians. He was confident that sculpture and painting had reached perfection in the time of HOMER, his evidence being the description of the Shield of ACHILLES. He gives the credit to PROMETHEUS of having been the originator of sculpture, and of course with a heavenly artist sublimity was inevitable. With such examples before them the human artists could not be expected to surpass works which were executed by hands without any mortal feebleness. Indeed, VASARI held that the great artists must have been specially endowed by Providence, for not only were they, he informs us, painters and sculptors, but also musicians, poets and philosophers. It is evident he was a believer in the legend of PYGMALION, and that marble statues could be endowed with life. It was no wonder, therefore, as he says, that slaves were prohibited from practising the arts, although an acquaintance with Roman literature would have made him doubtful of that statement, for it is to be feared that many an able Greek sculptor wore the collar of servitude.



In justice to VASARI it must be granted that he was not altogether satisfied with the origin of sculpture which he related. Was he not of Tuscany, and why should a native of that region go for the beginnings of art to Egypt, or Ethiopia, or Chaldea, when the illustrious LEON BATTISTA ALBERTI, the architect, had declared that art existed at a still earlier time in Tuscany, and there was the wonderful sepulchre of PORSENA with its contents to support his assertions? Only a few years before while VASARI was engaged in writing his book, the *Chimaera* was found in his native town, Arezzo, and it was also assumed to confirm the belief in the antiquity of Etruscan sculpture. But finally VASARI concluded that the first model was man and the first artist nature. He declared that he knew of mere children who, without other teaching than that of nature, were able to practise art, and there was no reason why in former ages a similar course might not have been followed.

According to VASARI, the arts, after being assembled in Rome, deteriorated under the later CÆSARS. In building especially there was a declension, and he believed that was owing to the difficulty of meeting with able architects. He had a misgiving, however, that the change could be exceeded on other occasions, for all the arts were doomed to extinction. He allowed that during invasions of the barbarians architecture received rather more respect than painting or sculpture, because it ministered to utility. Even more destructive than the Goths, according to VASARI, were zealous Christians, whose rage against everything dating from pagan times was unbounded. It is a gloomy chapter in the history of the world which he had to narrate, but it is not to be expected that the spirit of progress will always continue to operate on the same lines. VASARI would not have been sorry if the early churches which he described as Gothic, but which are now known generally as Romanesque, had in turn been overthrown like the pagan temples. He was an architect with admiration for Roman forms, and all other styles were of no value in his eyes. He was no doubt proud to be in a position to declare that it was in Florence the revival of architecture began with the church of St. Apostolo, which was so graceful in its forms and so admirably proportioned that BRUNELLESCHI employed it as a model for two of his churches. Signor CATTANEO does not agree with VASARI about the age of the church, nor that it was founded by CHARLEMAGNE. It is a more modern building, and is not supposed to date beyond the eleventh century. That period VASARI admits was favourable to architecture, for the church of San Miniato was rebuilt. But the art of mosaic-working was not then in an advanced state, and the example in the church referred to by VASARI was executed in 1297. The construction of the Pisan Cathedral from the design of BUSCHETTO, according to VASARI, excited emulation in other cities which was favourable to progress. Soon after churches were erected in Pistoja, Lucca and elsewhere which were evidence of a new spirit.

It is strange that VASARI was unable to realise the fallacy of his theory about the power of nature to become an instructor when he speaks of the examples of painting and sculpture which were undertaken in the eleventh and twelfth centuries. Here again he displays his Tuscan patriotism. Not until 1250 was Heaven moved to pity, he says, by the noble spirits which Tuscany reared to restore to them their primitive skill. Then their eyes were opened; they realised the beauty of the antique, and endeavoured to imitate it. They discovered the weakness of the Byzantine artists, who in Florence and elsewhere were allowed to produce hideous figures.

The reformation in painting he ascribes to CIMABUE, who was a Florentine, and it is apparent that partiality for a fellow-countryman was not without effect on several of the biographies. It is possible that CIMABUE was not so far above contemporary artists as is made out. VASARI is always contrasting his works with some of which no trace remains, and even when they are a little crude, as he confesses, they are in his eyes meritorious besides some others. Lord LEIGHTON helped to impart a new interest to CIMABUE. He classes him with DUCCIO, who in VASARI'S time was considered to be below mediocrity, and believes that the works of the two are impregnated with Byzantine feeling and occasionally reveal startling reminiscences of Classic dignity and power. Rigidly interpreted, that means

the adoption of stereotyped forms. VASARI seems to be nearer the truth when he affirms that GIOTTO alone, by Heaven's blessing, succeeded in resuscitating art and leading it into the right path.

It is remarkable in going through the pages of VASARI how often it appears to be necessary to make fresh starts in every one of the arts. Evidently it was not easy to discover what was accomplished by other men without undertaking toilsome journeys, and as the processes employed were often kept secret, the conclusions about them had frequently to be based on guesswork. The leaning tower of Pisa, for instance, is a popular example of the results of careless piling, yet piles must have been used in many parts of Italy, and the method of dealing with them was easily discovered. It seems incredible also that in a country where stone abounded nobody used stone paving before ARNOLFO DI LAPPO in the thirteenth century, or that the art of preparing the cement utilised in fixing mosaic should be unknown until ANDREA brought a Greek to Florence.

It was the precariousness of the existence of artists which must have inspired VASARI with the despondency which is so often noticeable in his biographies. Everything important in art depended on individuals, and in the sixteenth century there were so many dangers to life that the best artist might unexpectedly pass away. There was also much secretiveness about processes, and VASARI, from his peculiar status—for he was not only an artist but an encyclopædist in whatever related to art—well knew that in a sudden quarrel of a few moments duration the knowledge and skill which had been patiently acquired might vanish, and there would be a revival to some extent of the Dark Ages. He could not rise to the position of realising that the world was subjected to system and there was a special providence in the fall of a sparrow. He must have lived in a constant apprehension of danger to the arts he loved. And yet there is no work in the world which is more suggestive of the forces which were in operation during the long period of the Renaissance, and how they all tended towards an end which we can well call progress. It did not necessarily entail that a great artist was succeeded by one who was greater, or that the latest of VASARI'S biographies have surpassed those with which the series was opened. That might be the outcome of an evolution inspired by mortals. In the mundane system there is ebbing and flowing, but advance seems predestined. To us VASARI'S Lives appear to be full of hope, and many artists may consider living in the times he describes was preferable to living in the twentieth century. It is, however, difficult to judge fairly of progress when we have to look at it closely. Then we cannot help falling into the moods of hope and fear which alternated in VASARI'S mind. But as we are, or should be, better instructed about the course of events, courage and not despair should predominate with us.

#### ENGINEERING AND ARCHITECTURAL EDUCATION IN AMERICA.

THE success of the Americans not only in many varieties of manufacture, but in the fine arts, is to Europeans the more remarkable because it was unexpected. For years there was a popular belief in this country that the products of the people of the United States were intended to deceive the unwary, and it was thought the ingenuity for creating shams was not confined to wooden nutmegs. The prejudice was in some measure owing to the writers of English books of travels. They were not qualified to discern the extent of the inventive powers of the Americans, and they adopted the manner of superior beings who pitied the rude attempts of imitators. The railways which had to be constructed as cheaply as possible were compared with the English North-Western and Great Western. It was not realised how efficacious were the American tracks in uniting new settlements which were far apart, and how they served that end by the most economical adaptation of materials. The early bridges might appear to be frail structures, but they sustained the traffic until the companies became sufficiently prosperous to be able to erect bridges of another class. The preference then given to trusses, bracing and latticing rather than to solid webs like the Britannia and Victoria



bridges was enough to indicate the respect for economy, and the resolve to employ material in the positions where it was needed and nowhere else. It is now plain that in knowledge of the principles of braced construction the Americans were far ahead of English engineers. It was science not empiricism which guided them, and it might have been foreseen that a similar procedure would be observed in other classes of work.

It was true that in America the inventiveness was a native characteristic and could not be said to have been fostered or created by schools or colleges. It is only necessary to glance over the pages of EMERSON, who was college bred, to discover how little the best minds in America thought about that mode of instruction. Attendance in a university was fancied to be useful in dispelling the illusion that such institutions were of service in strengthening the individual. No true man it was asserted was produced by college rules. CHARLES DICKENS, who was disposed to be severe when judging American institutions, was not afraid to display more kindness to the universities. Whatever might be their defects, he said that they disseminated no prejudices, reared no bigots, dug up no old superstitions, and never interposed between the people and their improvement. At a later time EMERSON modified many of his conclusions, and acknowledged that universities and colleges had their uses as agents in progress. The system of teaching, however, which was adopted did not correspond with that of Europe. With the Americans the ideal man is a creator adapting the materials afforded by nature to new requirements. The endeavour is to qualify him for that purpose by strengthening the faculties with which he is endowed. In all parts of Europe the aim of a university might be shortly expressed by saying it is the production of a learned man who is to be a reservoir of the knowledge which has descended from the past, and who can use it for his own enjoyment or the benefit of others by talking or teaching. That condition of mind is to an American a luxury which few can attain. Our modern technical colleges are no more than imitations of the system which has been in operation in the United States during several years. But that fact was not generally known in England. Mr. CARNEGIE was therefore acting wisely when he suggested to the promoters of the Birmingham University that they should visit the colleges and universities in the United States, in which there is a departure from the Mediæval system of instruction. The report which was prepared by the visitors is a document which deserves more attention than it has received.

In some cases tuition is free, and in colleges where fees of from 30% to 40% per annum are paid there are some free scholars. But the American nature is opposed to eleemosynary assistance, and students prefer to engage in outside work during the vacations so as to earn money to pay their fees. To obtain entrance into one of these institutions a matriculation examination must be passed, which is not as literary but is more mathematical than that for the University of London. The students are assumed to have the resolution to go through a four years' course and to become graduates. A working session ranges from thirty-three to thirty-eight weeks, and in addition there are excursion classes and workshop classes. The work of the student is not confined to attendance in a classroom. He has to get up the subject matter of the lectures at home, and in many instances lectures can be considered as an exposition and experimental illustration of the text-book. At each lecture particular students are questioned before the class about the text-book or the lectures, and are expected to be capable of drawing any needful diagrams on the blackboard. Any student who is unable or unwilling to keep up with the rest is excluded from the graduation course.

One of the results of the apprehension of being set aside is that the students keep continuously at work. In the fourth year a long time is devoted to the preparation of a thesis which represents an investigation of some technical problem by a student. We are told that in some cases they exemplify original researches on such subjects as running tests of a locomotive, experiments on the laws of slide-valve friction and on the viscosity and friction of lubricants. The theses are bound and preserved in the libraries, and in course of time will have biographical interest. It some-

times happens that students who have graduated return for post-graduate work, and for that purpose may join a different institution.

The number of teachers is much greater than in England. Specialisation is recognised as far as possible. For instance, in Sibley College, for 471 students there are six professors, three assistant professors, twelve instructors and twelve assistants, making a total staff of thirty-three. In the Institute of Technology, Boston, there are twenty-three professors, thirty assistant professors, fifty instructors and thirty-three assistants, or a staff of 136 for the instruction of 1,171 students. In the manual training classes there is usually one instructor to about twelve students.

The visitors were struck with the ample area assigned to the buildings. Each college stands in its own grounds, and is well lighted. Halls, staircases, corridors, classrooms and laboratories are all on a large scale. It is added that the apparatus, instead of being huddled away in dark corners, is set out and classified as if for exhibition, while the machinery occupies a space worthy of its importance. Students have a general as well as special libraries for each department, and the books can be taken home. The University of Philadelphia has a club for the students, the subscription being two dollars a year. All classes show enthusiasm for the new universities, and encouragement is given by generous gifts.

Manual training is an important part in the education. From five to nine hours a week are devoted to joinery, wood pattern-making, moulding and foundrywork, forging, fitting, metal turning and machinework. Where there is a summer vacation class the students work continuously for about eight hours a day for four weeks. Lathes, pumps and steam-engines are made wholly, or in part, and the care of engines and boilers is taught. From fifteen to twenty-five students work in one shop. A joiners' shop has usually about twenty benches, each fitted with a complete set of wood-working tools. There are also twenty plain lathes. The machinery comprises a circular saw, a planer and a band saw. There is a foundry with the usual appliances, a smith's shop with twenty fires. In the machine shop there are from twenty to thirty engine lathes, some of them adapted to heavy work, besides milling machines, planers, radial drills and shapers. Everything is suggestive of practical work rather than of amateur exercises. The lectures given are on kinematics of machinery, descriptive engineering, theory of heat engines, theory of hydraulics and motors, strength of materials, machine design.

Students of mechanical engineering as a rule go through a short course in electrical engineering. Students of electrical engineering for the first and second years follow nearly the same course as mechanical engineers, but in the third and fourth years laboratory work receives most attention. There is a desire that the distinction between the two branches should be abolished. The laboratories are furnished with varieties of dynamos and motors. There is no uniformity in the training of civil engineers and mechanical engineers; although the courses for the first year, viz. mathematics, physics, chemistry and workshop practice, are in some colleges identical for both, in others the manual training is entirely omitted. In Cornell University the civil engineers form an entirely separate body. Field work is carried on throughout the year and bridge construction occupies a large part of the two last years, the student preparing designs and stress sheets in accordance with the practice of the leading bridge companies. For mining students there are laboratories equipped for the treatment of ores of gold, copper, silver, lead. In Columbia University the students sometimes spend weeks in a mining district where the processes of mining can be inspected. The chemical laboratories are spacious and electrolytic methods are being introduced. The professors are usually experts in chemical industries, and all sections of the science, including sanitary chemistry, are provided for. The visitors came to the conclusion that the system adopted in the colleges they inspected at Boston, Worcester, Cambridge, Ithica, Chicago, Baltimore, Philadelphia, New York, Jersey City, with no great modifications may be admirably adapted to British requirements. According to them the essential difference between the American and the British plans consists in the provision in



the former of large workshops and spacious laboratories well fitted with appliances for large classes, and in the four years' course, which alone makes the thorough manual training possible.

Every Government and all who sympathise with authority are obliged to realise the importance of imports and exports, and, if possible, to secure that the exports are in excess. In a country like America, where heavy duties are charged on the products of other countries, the revenue is largely assisted by that means. It is a public duty, therefore, to aid the export trade, and on that account machinery and other appliances should be constructed to suit foreign demands. Architecture, unfortunately, cannot be classed among exports, although American architects would willingly accept foreign commissions. The reason which makes the universities eager to train able engineers does not apply to architects. It has been arranged, however, that architectural studies are also to come under the protection of several universities. In some, as in Illinois, two courses of study are recognised, the artistic and the engineering or constructional. In Syracuse architects and engineers take mathematics, language and history together, while students of art and architecture follow similar courses in freehand drawing. It is recognised by the American architects that engineering as a whole receives more attention, and they desire that in the universities the students should be kept during the four years' course closely to architecture, thus leaving elementary knowledge to be acquired in preparatory schools. It would be necessary in order to attain that end for a rearrangement of courses of study to take place. There is so strong a desire that America should be distinguished in whatever is knowable or to be taught, it is not unlikely that changes will be made by which the architectural student will be placed on a similar footing with the French student. The disposition shown towards art confirms what was said by DICKENS about the universities never becoming an obstacle between the people and their improvement, and that a world is recognised as lying beyond the college walls. How long a time must elapse before the authorities of the English universities will assume so friendly an attitude towards architecture or any of the other fine arts?

### ISOLATION HOSPITALS.\*

IN determining the hospital accommodation which will be required for the treatment of infectious disease in any particular locality, the number, character, occupation and surroundings of the population will be the main factors for consideration, not only with a view to the regular and constant recurrence of infectious disease in populous and crowded neighbourhoods, but also to periods of epidemic when some particular form of infection has gained a footing, and when a sudden and increased demand will be made for beds. Upon the industrial character of the neighbourhood will mainly depend how far the future is to be taken into account. If works and workmen's houses are likely to increase in number, the enlargement or duplication of any hospital, whether general or infectious, may be confidently anticipated as the development takes place. In a purely residential neighbourhood the first provision need not be proportionately so large, nor the need for extension so carefully considered, because infectious disease is less frequent, does not spread so rapidly, and is more effectively dealt with in better and detached houses than it can be in more crowded districts. Neither is it a matter of existence in the same degree, because the bread-winners are not necessarily involved in complete severance from their work for a long period of infection, to which also they have better chance of resistance.

It is considered that in urban districts one bed per 1,000, and in rural districts one per 1,500 of the population is the ratio to be observed, and, as a rough guide, this may be a near enough approximation. But experience will probably modify this estimate in many districts, while the need for future extension must be still borne in mind, and also the possibility that an epidemic might tax resources of the medical authorities to their utmost capacity.

In speaking generally of isolation hospitals, those for the reception of the commoner diseases are usually implied, while those for smallpox stand by themselves, and though constructionally the same, must be more carefully separated from other

buildings, and, when possible, completely isolated and in the open, and must have a larger space per bed and more ample provision for ventilation. It seems unlikely that the number of diseases classed as infectious will diminish; but it is outside the scope of this paper to describe such buildings, for instance, as those for the isolation of consumption patients, or of such special diseases as plague, precautions against which must be vigilantly observed, though its treatment as an epidemic in this country must necessarily be one of emergency rather than one of regular establishment.

In England, while general hospitals are usually built and managed by private effort, it falls to some constituted local authority to erect, equip and maintain those specially designed for infectious cases. Our large infirmaries seem, on the whole, to succeed under private management upon voluntary subscriptions and endowment. But an infectious hospital may in many districts be comparatively little used. The continuous interest needed for private effort is wanting, the yearly expenditure is an uncertain quantity, and the nature of the place forbids communication with the outside world. Moreover, it is as much a protective as a remedial institution, and it is therefore natural to look to a local governing body, with its legal status and rate aid, to provide protection for the community it governs. The only question is whether organisation might not be better effected and protection more complete if larger areas and less divided responsibility were substituted for our present system.

Local authorities have, of late years, realised their responsibility in this matter, and a great improvement has taken place in the methods of dealing with infectious disease, but the provision in many rural districts—especially those where small industrial centres are scattered about—is often very inadequate. In times of epidemic the result is often careless removal and premature discharge, sometimes leading to serious results. Constant recurrence of disease in particular localities is due generally to preventable causes, and if such causes were carefully investigated and remedied much sickness and misery might be prevented and cost saved in the treatment of disease. The authorities should not have to provide hasty and improper accommodation or to discharge patients too soon in order to make room for others.

It may perhaps be here noted that the ability and standing of the medical officer of health is of the very greatest importance, not only in the management of the hospitals, but in reducing their number and costliness, and the economic loss caused by disease and death. It is, to my mind, very desirable that he should be an independent man, with no private practice, and in charge of a large enough district to keep him fully employed; indeed, it is a question whether each county could not have its complete organisation for dealing with infectious disease, able to secure the very best man as its chief medical officer, with district officers under him, and with large powers for dealing with hospital accommodation and with problems arising from insanitary dwellings and surroundings, and with sewage disposal, stream pollution and so on.

In the choice of a site the same principles apply as in the case of any building where people wish to live the healthiest possible lives, and in many towns it is really difficult to find such a site. If the ideal ground is not available the arrangement and construction of the buildings upon it must be such as to make the most of, and, if possible, improve the natural advantages already existing. In this country the conditions to be aimed at are a warm, dry soil, with good water-supply and outfall for drainage, a proper means of sewage disposal, as much open space round it and as much sun and air and quiet as possible. The best combination of accessibility and isolation are particular requirements. But, in any case, the site must be large enough to contain all the buildings required at proper specified distances one from another and from the boundaries, and to admit of future extension whenever it may be required or for temporary wards should they be needed in a sudden emergency of epidemic.

We may divide isolation hospitals into three classes:—

1. Large urban hospitals;
2. Hospitals of a smaller class serving a smaller town or country district;
3. Small isolation wards connected with a large institution, e.g. asylums, workhouses, &c.

The first and last of these will almost certainly be in the vicinity of other buildings, the second may and should stand perfectly free in the open country.

According to the Local Government Board requirements no buildings may be within 40 feet of each other or of the boundary, but more is of course desirable, if possible, especially if the value of land necessitates more than one storey. In a town the site should be surrounded on all sides by streets, and though a properly constructed and efficiently managed hospital is a security to a neighbourhood rather than a cause of infection, there may still be some degree of danger in a small hospital where the supervision and management happen to become lax.

In a crowded neighbourhood it is no doubt desirable for the

\* A paper read by Percy Scott Worthington, M.A., A.R.I.B.A., before the Sanitary Congress, Manchester.



local authority to obtain direct control over surrounding property, not only that it may exercise supervision when and where necessary, but also to secure possibility for extension, and where various authorities adjoin one another, none of which thinks itself justified in building their own hospital, they may combine in carrying out a joint scheme, while friendly co-operation between neighbouring councils may result in either dealing with infectious disease in one place or so distributing the buildings as best to serve the aggregate population.

However small or simple an isolation hospital may be, it contains in its principle of arrangement and of construction the germs of larger and more complicated buildings, and in materials and details, so far as they go, there should be no difference whatever. Let us, therefore, to begin with, take a simple form of hospital and examine the points to be observed in its plan and construction.

In districts where only a small number of beds is required it is not necessary to make any considerable provision for subdivision of diseases. Small isolation-rooms in connection with the larger men's and women's wards will probably be sufficient. But if more than, say, twenty beds (ten men and ten women) are needed, the consideration of subdivision will come in; distinct buildings will then be required for the treatment of diseases.

Let us take a hospital for fourteen beds—seven men and seven women.

The administration will be in the centre, dividing the men's and women's sides, and connected to each by an isolated corridor, and containing accommodation for matron and nurses, a doctor's room, reception-room (which will probably also serve for discharging patients), a bath-room, stores and offices, with kitchen and its offices at the back. Behind, in a detached building, will be the mortuary, ambulance house and disinfectory, with boiler-house, coal stores, &c.

For dealing with infected linen and clothes a galvanised iron tub on wheels will be found most useful, which should stand just outside an opening convenient for receiving the infected things and with an arrangement for turning boiling water and disinfectants into it. Everything can then be removed at once to the disinfectory.

The wards on each side are approached from the administration by a corridor, which should have a disconnecting lobby or covered way open to the air between the administration and the other buildings. From these either side of the hospital may be approached directly without passage through the administration buildings, and each side will contain a ward for six beds with a kitchen adjoining and dividing it from a single ward, or perhaps two, for isolating cases from the larger ward. The kitchen should have a small range for keeping food warm, boiling milk, &c., a sink with hot and cold water supply and a ventilated cupboard for keeping food and milk, and it must also have means of supervision of the larger and smaller ward through windows opening into each. There will be a store for ward linen, &c. Convalescent rooms are, perhaps, a luxury in a small hospital. As much opportunity as possible should be given for throwing corridors completely open to the air.

Separate sanitary arrangements cannot be provided, and are not needed for the small wards, but those for the larger wards should be in detached blocks and separated from them by cross ventilated lobbies with a door at each end, so as to form complete cut-off passages. The bathing and washing arrangements should be in a separate block from the w.c.'s and nurses' sinks, and both should be slightly warmed to a lower temperature than that of the wards by pipes in connection with the hot-water service. A similar means may be adopted for keeping linen stores properly aired. One w.c. to ten patients is sufficient, and adjoining should be the sink-room for slops, washing ward utensils, &c., and out of this should open a private nurses' w.c. The sanitary blocks should be lined with glazed bricks or tiles; if the former, narrow division bricks, known as Shepwood bricks, make strong and thin partition walls. The divisions need not go up to the ceiling, and thus cross ventilation may be obtained by windows on opposite sides. In the smallest hospitals fixed baths are not always required, a movable one being alone provided. But this is not a very desirable arrangement. The best baths for hospital use are probably vitreous enamel baths, which are now made by many firms, and which, while having a lasting surface similar to that of a stoneware bath, are much less costly, and being made of metal, get heated at once instead of remaining cold like stoneware.

As to the space to be given to each bed the following are the figures generally accepted:—Cubic space of air per bed, 2,000 cubic feet; floor space per bed, 144 square feet; wall space per bed, 12 feet lineal between centre. The figures give a ward 24 feet wide, a little under 14 feet high, and of a length according to the number of beds, each additional bed adding 12 feet to the room. In a single-bedded ward the height of 14 feet gives a room 12 feet square, or 14 × 10. These rooms

may with advantage be made rather larger, and a height of 12 feet 6 inches or 13 feet is quite enough.

In a hospital of this type the wards should be not at right-angles with the remainder of the building, so that one side wall against which the beds are placed is partly an interval wall, but so that the interval wall is the end of the ward, and so that a window may be placed between each of the beds.

Small isolation wards will be required in most large general infirmaries for a few beds for men and women, especially in districts where mining and other accidents of a similar nature are frequent. They afford the means of isolating infectious disease should it occur, pending its removal to an infectious hospital, but will be chiefly useful for the treatment of septic cases.

The moderate sized hospital for larger rural districts will consist (1) of an administration block which must either be built large enough in the first instance to suit further extension, or so planned that a definite idea of the necessary additions is laid down in the original plans, a proviso which applies also to the arrangement of the ward blocks and to the laying-out of the site generally. The administration block contains the accommodation in the hospital previously described upon a suitable scale, with a dispensary and rooms for a caretaker and his wife, who will look after the hospital if it is empty and be qualified to help in it when it is occupied, or a separate cottage may be erected.

In addition to the receiving-room, a detached discharging-room should be provided, with bathing facilities and clothes storage, &c. The administration block will be near the entrance, but so placed with regard to the wards as to render service as convenient as possible, for food will have to be prepared here and distributed to the wards, with which there may be connection by covered ways open at the sides.

In the country it should never be necessary to build the wards of more than one storey, but, as before mentioned, the site should be adapted to considerably more ward accommodation than is built at first. The men's and women's sides must be completely separate and pavilions erected for the treatment of separate diseases, so that no two may be located in the same room. A small single ward in a pavilion may be safely used in case of an isolated case even in the same block with other diseases if due precautions are taken, but it is not desirable.

In this climate it is only in very exceptional summers that we get too much of the sun, and the wards must therefore be planned so as to catch the most useful sunlight all the year round, and the axes of the wards should therefore be north-east and south-west. The planning of the wards will be upon the same principle as those previously described, the number of beds in each being determined by the needs of the locality and the convenience of nursing.

It is recommended sometimes that all the wards should be built upon arches so that there is a clear air space underneath open to the air as there is above and around. The idea is plausible, and from a constructional point of view permissible where a hospital ward is of necessity raised a man's height above the level of the ground and the space below cannot be usefully occupied. On very sloping ground, where the wards must be connected by corridors, this sometimes happens in order to avoid unduly steep gradients in the corridors, but never in an infectious hospital where the buildings are completely detached, and will be adapted with terraces each to its own position. Unless the arched space is high enough to walk about in, it only becomes a receptacle for all kinds of refuse and rubbish, and even then, unless properly attended to. The ward walls should be built straight up from the foundations, the area under them covered with 6 inches of concrete after the top soil has been removed, the space below the floor easily accessible and sufficiently high for inspection, and thoroughly well ventilated by air grids, through which no vermin can penetrate.

There still remain those large urban hospitals to which different conditions apply, and where the details of administration become considerably more complicated. Here we shall require more wards and further subdivision, and besides them the following buildings:—(1) A receiving block; (2) discharging block; (3) porter's lodge; (4) quarters for the resident medical staff; (5) quarters for matron, nurses and servants; (6) kitchens and stores so placed that they are central and convenient for the service of the whole establishment; (7) dispensary; (8) block containing boiler-house, disinfectory and destructor, mortuary and post-mortem rooms, ambulance sheds and stables, and conveniently situated with regard to the boilers, washhouses and laundries for the patients and the staff.

It is probable that the wards may have to be of more than one storey. Their axes should be N.E. and S.W., and no two wards, either on the same or different levels, should have communication by closed passage, stair or lift with one another. The pavilions may be connected by open covered ways, but every one must have its access direct from the open air.

In a large hospital which is continually occupied it is



necessary to allow the wards in turn to lie empty or fallow for a time, and therefore this must be taken into consideration in the number of wards required. The rooms attached to each ward, which should not contain more than twenty to twenty-four beds, will be more in number than in the previous types examined. In addition to a ward kitchen there will be a room for the sister in charge, and probably two separation wards, one adjoining and inspected from the ward kitchen, the other from the sister's room. The supply of these rooms should be liberal, as they may be used not only for cases which require separation from the general ward, but also for private paying patients, whose number will probably increase rather than diminish in the future, though they should not be allowed to encroach upon the primary object of such a hospital, *i.e.* the isolation and nursing of the sick poor. Still the objection does not apply in the case of an infectious hospital to the same extent as in a general infirmary since their isolation is a protection to the public. The sanitary blocks will be of the same character as those before described, but in proportion to the number of beds, and containing a small room for the retention and examination of excreta, with a sink in a ventilated cupboard.

Circular wards are not unsuitable for infectious purposes. They are very little more expensive than rectangular wards; ventilation and warming is very easily managed, they are easy for nursing and pleasant for patients, and they fit many positions on a site into which it would be difficult to put a rectangular building to hold the same number of beds. They are not extravagant up to about sixteen beds; beyond that number the diameter has to be so largely increased for every additional bed that the cubic contents swell very rapidly, and hence the cost becomes proportionately much greater than that of a rectangular ward.

A few words should be said about materials and details of construction, and about warming and ventilation, which make or mar the convenience, durability and usefulness of a hospital, independently of its general arrangement.

The materials used should of course be as absorbent as possible, and their surfaces hard, smooth and easily cleaned, with no holes or corners for lodgement of dirt, dust or germs. Probably nothing is better for walls and ceilings than Portland cement or adamant or for the floors than terrazzo; all floors should be of solid concrete. Terrazzo is apt to crack if laid in the ordinary manner, but this may be largely prevented, and it is probably better for the purpose under consideration than any wood-block floor. There is, however, a wide difference of opinion about this, but if a wooden surface is adopted, the blocks (oak or maple, for choice) should be thoroughly well seasoned, and great care should be taken as to the atmospheric conditions under which they are laid.

All external and internal angles to walls, floors and ceilings should, of course, be rounded, and raised borders should run along the lateral walls of the wards to keep the beds off the walls, and in one-storey wards and on the first floor of two-storeyed blocks the ceiling may with advantage be curved if the proper ventilation is secured at the highest point.

The windows should, up to about two-thirds of their height, have double-hung sashes, the lower half with a deep bottom rail to allow of the admission of air at the meeting rails without draught at the bottom, or so as to fall inwards as a hopper, the sides of which are closed in by projecting casings filling up the angles flush with the wall face on their inner side. Above the sashes is a transom dividing them from three hoppers, one above the other, which open and close with gearing worked by a key in possession of the nurses. The doors should be upon the same principle, the place of the sashes being taken by the doors, and the ventilating hoppers in both should be carried as near the ceiling as possible. The doors of all rooms should be glazed in the upper part for light and easy inspection.

Wooden floors should be wax-polished and other woodwork varnished and cement walls painted and varnished. Fireplaces in the smaller rooms are probably best made of salt glazed or faience ware, very simple and without mouldings, and the ward fireplaces should be considered as a part of the scheme for their warming and ventilation.

This problem of ventilation is, as everyone knows, the most difficult with which an architect has to deal owing to the uncertainty of atmospheric conditions.

The ventilation of one-storey wards in an open position is, of course, simpler than that of wards of more than one storey in a town atmosphere, and probably doors, windows and effective types of roof ventilators, and of central stoves, will serve the purpose best. Ventilation must, of course, always be carefully considered in connection with any artificial heating introduced apart from the stoves.

If a certainty is to be made of effective ventilation without draught in all sorts of weather, there is no doubt that mechanical means must be adopted, and that warmed air must be admitted and the vitiated air extracted by fans through flues in the walls.

The atmosphere of manufacturing towns is not what we

should wish to admit to a hospital, and attempts are often made to cleanse and warm or cool the incoming air in basement chambers, and thence pass it through ducts into the rooms. In hospitals, this seems to me a bad thing. Its costliness is no objection if it is the best method and if the money is available, but it entails grave defects, to my mind, as applied upon a large scale.

The air admitted to the wards is not of the pleasantest or healthiest nature, and the excessive length of ducts for inlet and outlet, inaccessible and sure to collect dust and germs after considerable use, become sources of danger.

It is quite possible to arrange the extraction of foul air at the ceiling level, and at one point, so that the shaft is of comparatively short length, straight and large enough for a man to get into for cleaning purposes. But it is impossible to heat a large ward satisfactorily upon this principle with only one inlet, and it is the multiplication of the flues that is, to my mind, undesirable.

On the other hand, the system is quite applicable on a small scale, *e.g.* for the warming and ventilating of an operating-room, provided that the greatest care is taken to secure the means of cleaning and disinfection.

One simple way of warming is by admitting the air through grids at various points, and passing it over radiators or pipes with proper shields to prevent too rapid admission and consequent draught, and auxiliary warmth may be obtained by the use of central faience or iron stoves with down-cast smoke flues and inlets for fresh air from the side walls, through which the air is admitted to the centre of the stove, passed round it and emitted warmed through gratings in the top or sides. But proper methods of cleaning must be provided from the outside of the building for both smoke and air flues, and no cleaning doors in the floor should be allowed.

In country districts water and sewage will be difficulties. The former will, of course, be one of the first considerations in the choice of a site, and without it no hospital can be erected. If it is to be found on the site the disposal of sewage becomes a still more important consideration. The subject is so large that it cannot well be entered upon at this stage, but failing a proper sewer the best recognised and tried method of treatment is by septic tanks. Here, however, there is still the difficulty of the overflow, which must be turned into a stream somewhere or other, and though after the tanks once get into working order the effluent is apparently as good as can be expected, it is not certain that it always remains so after exposure to atmospheric and other influences. It may be distributed over the land, and an interesting experiment is, I understand, being tried in this neighbourhood in utilising it by pumping into the boilers.

I assume familiarity with the Local Government Board requirements, which are quite good and have altered very little since their first publication.

A paper of this length leaves no room for the treatment of the subject of isolation hospitals in anything but a cursory manner, and as my point of view is that of the architect, there will, no doubt, be many points of management and so on that have been disregarded. I am quite aware also that there will be differences of opinion even from the architect's side of the question, to which, I hope, expression may be given, for in all these things it is the balance of the best experience and opinion which determine future development.

#### SCHOOL OF ART WOOD-CARVING.

THE School of Art Wood-carving, South Kensington, which now occupies rooms on the top floor of the new building of the Royal School of Art Needlework in Exhibition Road, has been reopened after the usual summer vacation, and we are requested to state that some of the free studentships maintained by means of funds granted to the school by the Technical Education Board of the London County Council and by the Drapers' Company are vacant. The day classes of the school are held from 10 to 1 and 2 to 5 on five days of the week, and from 10 to 1 on Saturdays. The evening class meets on three evenings a week and on Saturday afternoons. Forms of application for the free studentships and any further particulars relating to the school may be obtained from the manager.

**The Students' Days** at the National Gallery of British Art, Millbank (the Tate Gallery), will be, from October 7, Tuesdays and Wednesdays, instead of Thursdays and Fridays, as at present. The public will be admitted on Tuesdays and Wednesdays, students' days, upon payment of 6d.; on the remaining days of the week the gallery is open to the public free.



## NOTES AND COMMENTS.

DURING several years Arundel Castle has been undergoing restoration and renewal, and a large amount of money was expended on the works. In the town, which is remarkable for indifference to rebuilding, the extent of the works has made the populace believe that all the profits derived from the transformation of Norfolk Street and the rest of the Duke of NORFOLK'S property near the Strand has to be expended on Arundel Castle. Landscape-painters may not believe the new walls to be as worthy of representation as those which bore the marks of time. But there is no doubt that the castle, if regarded as a group of buildings, has benefited by the alterations. Every architect knows that generally the expenditure of money makes a building more valuable in the ordinary sense of the word, although it may lose some of its historical interest by the substitution of new masonry for old. If we could imagine Arundel Castle in the property market, it would now command a higher price than was likely to have been given before the structural alterations were undertaken. The local poor law overseers have adopted that theory, and they have increased the value of the property from 1,200*l.* to 2,000*l.* a year. It is needless to say that if judged by size, quality, position, &c., both sums are insignificant. But the stately homes of England are never valued on the same basis as common residences. There is always apprehension that the owners might refuse to occupy their castles if the taxation were too high, and then loss would be suffered by the people in the vicinity. An appeal was raised against the valuation, and the amount was reduced to 1,750*l.*, but that sum has not been agreed to by the Duke's advisers. Unless there is a compromise, the case will, therefore, have to be brought before Quarter Sessions. So many considerations have to be taken into account, it is difficult to see what is to be the issue. But if instead of a castle the building was a factory, it would be taken for granted that 1,750*l.* was a remarkably low valuation, and the rates would be cheerfully paid which were assessed.

HERALDS are not imaginative or rather inventive in devising mottoes. Some of the new metropolitan sub-cities have, in consequence, been forced to seek for mottoes for arms by means of competition. The people of Glasgow may well be envied for the aptness of theirs. What can be more significant than "Let Glasgow flourish"? Not only every loyal citizen, but people in many parts of the world have joined in that wish. How did it originate? That is a subject which has been under the attention of the Town Council, for on June 30 a committee was appointed to consider the propriety of so altering the motto of the city as to restore it to something like its former phraseology. The history of a motto may be as good a subject for investigation as could be easily found, but restoration or completion is another matter. The proverb runs, "Let well enough alone," and it should be applied in this case. It has been ascertained, however, that originally the emblems or devices on the Corporation's seals were derived from those displayed by the bishops. But apparently there was no motto during a long period. On a bell for the Tron Church which was ordered in 1631 there is an inscription in the circle surrounding the shield which runs, "LORD, let Glasgow flourish through the preaching of Thy Word and praising Thy Name." That is the first authenticated instance of an inscription or motto accompanying the arms of Glasgow. But whether it was only one of the pious wishes used by bell-founders or was dictated by heralds cannot be ascertained. Subsequently the inscription was abbreviated to "Let Glasgow flourish by the preaching of the Word," and finally to "Let Glasgow flourish." The last was in use in 1699. Readers of romances are also aware that it was a common expression in the early part of the eighteenth century. Did not ROB ROY utter the words as an exclamation when he heard of the feat of Bailie NICOL JARVIE with the red-hot poker at the Clachen of Aberfoyle? The longer inscription could not be employed so familiarly. We may compare the motto to the Venus of Milo. That noble statue is likewise incomplete. But judging by the failure of the experiments to restore it to its former state, it is better to accept it in its present form, and a like conclusion may be applied to the Glasgow inscription.

## ILLUSTRATIONS.

LLOYD'S BUILDING, FENCHURCH STREET, E.C.: THE VESTIBULE.

KING'S COLLEGE SCHOOL, WIMBLEDON COMMON, S.W.

KING'S College School was opened in 1831, having been founded as part of the Royal foundation of King's College, London, by royal charter of King GEORGE IV., bearing date August 14, 1829. The school was from the first and still is under the government of the Council of King's College. The first head-master, the Rev. J. R. MAJOR, D.D., held office for thirty-six years; his successor, Dr. MACLEAR, for twelve years. In 1880 Dr. STOKOE became head-master, and in 1889 he was succeeded by the present head-master, the Rev. C. W. BOURNE, M.A., of St. John's College, Cambridge. Until 1897 the school was carried on at King's College in the Strand. In that year the Council, in view of the superior advantages of a country over a town site and of the officially recognised need for a school of the first rank in this neighbourhood, decided to remove the school to its present situation facing Wimbledon Common. The site possessed the advantage of large buildings already in existence and easily adaptable for school purposes. But it was recognised from the first that it would be necessary to supplement the existing building at an early date. As a first instalment of the complete design for the permanent buildings, the Council have erected the large hall and classrooms opened by Field-Marshal H.R.H. the Duke of CAMBRIDGE, K.G., on July 6, 1899.

The new school buildings consist on the ground floor of six new classrooms, each 24 feet by 17 feet and 12 feet in height. These open off a corridor 7 feet wide and are connected by a still wider corridor with the old school buildings.

On the upper floor is the great hall, which measures 84 feet by 42 feet 6 inches and which has a height of 20 feet to the tie beam. This is one of the largest school halls in England. It is covered with an ornamented open timber roof of queen post type. The walls of the hall are of red brick, which gives it a bright and warm appearance, the roof being stained a dark colour. There will eventually be a gallery across the entrance end of the hall, as shown in the interior view.

The exterior of the building is faced with red bricks. The traceried and mullioned windows are executed in Corsham Down stone.

Special attention has been paid to the heating and ventilation of the building so as to bring it up to modern requirements. Fresh warmed air is introduced over ventilating radiators and is drawn from each classroom through an air trunk in the corridor floor into a heated main upcast flue. A continuous stream of warm fresh air is thus continually passing through the classrooms, which have an equable temperature throughout. The great hall is also thoroughly heated and ventilated.

The style the architects have selected is of the collegiate type, but with sufficient modern feeling to differentiate it from previous examples and give it a character of its own. The large windows at the ends of the great hall are of ample proportions. In the flanking towers to the front are the staircases to the great hall, and the upper parts are used as record-rooms for the school archives.

The new block forms the central feature of the complete design, and conveys an idea of the handsome appearance which the school will present when finished. The cost up to the present has been over 7,000*l.*

The general contractors for the whole building are Messrs. GOUGH & Co., of Hendon. The stonework and carving is by Messrs. FLINT, of New Street, Kennington. The clerk of works has been Mr. THOMAS GAMAGE. The work has been carried out from the designs and under the superintendence of Messrs. BANISTER FLETCHER & SONS, architects.

ST. DAVID'S CHURCH, BATHGATE.

CONGREGATIONAL CHURCH, FINCHLEY ROAD.



## DENE HOLES AT BEXLEY.\*

ACCORDING to Hasted's History of Kent, Baldwyns is a seat and reputed manor situated at the south-west corner of Dartford Heath. This place was anciently in the possession of Sir John Baude, a man of an honourable family in this kingdom, of whom it acquired the name of Baudwins, which it keeps at present, the difference of the language of the times only excepted.

It afterwards came into the possession of the abbot and convent of Lewes, who were possessed of lands in this parish as early as King John's reign; they in the first year of King Henry VIII. held it with other lands adjoining of the manor of Temple Dartford by the yearly rent of 2s. 5d. and suit of court.

In the sixteenth year of Henry VIII., on the suppression of this abbey, the revenues of it were granted to Cardinal Wolsey for the better endowment of his college, vulgarly called "Cardinal's College," at Oxford. Four years afterwards this, among other estates, was forfeited to the king, and became part of the royal revenues. That king, in his twenty-third year, granted it by the name of the manor of Baudwyns to Eton College, "to which it now belongs. (1797.)"

The Adams were formerly lessees of this estate under the college; afterwards held by Lovelace; and then by Sir Edward Hulse, Bart. He was the eldest son of Edward Hulse, M.D., by Dorothy, daughter of Thomas Westrow, Esq., and married Elizabeth, daughter of Richard Lovell, Lord Mayor in 1790. By her he had three sons, Edward, who succeeded him in title; Westrow, who died before him; and Richard, of whom



BEXLEY CHURCH.

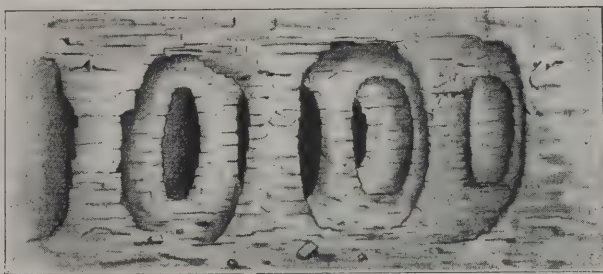
further mention will be made, and a daughter Elizabeth, married to John Calvert, Esq. Several years before his death he retired to Baldwyns, where he died 1759, and was buried in Wilmington churchyard. At his death he bequeathed his interest in the estate to his second son, Richard Hulse, who resided there. He served the office of sheriff in 1768, but on his removing to Blackheath in 1783 he sold his interest in it to Arnold Nesbit, Esq., who resided there, and in 1791 alienated it to Simon Frazer, Esq., a director of the East India Company. Mr. Frazer's daughter married Alexander, Lord Sefton, who died there in 1793.

Henry VII. granted 140 acres of Joyden Wood to Henry Cooke in capite by knight's service. The ancient camp and hut circles which you inspected to-day is supposed to be the site of Caswallon's city. Caswallon was a British chief, to whom the honour has been ascribed of defeating Cæsar.

William Lambarde, in his Perambulations, written about 1570, says:—"There are to be seen as well in the open heath (Bexley) neare to this towne (Crayford) as also in the closed grounds about it, sundry artificial caves or holes in the earth, whereof some have ten, fifteen and some twenty fathoms in depth; at the mouth (and hence downward) narrow, like to the tounell of a chimney or passage of a well; but in the bottom large, and of great receipt, insomuch as some of them have sundry roomes (or partitions) one within another, strongly vaulted and supported with pillars of chalke, and in the opinion of the inhabitants these were in former times digged, as well for the use of the chalke towards building, as for to marle (or amend) their arable lands therewith. But I suppose that they were made to another's ende also by the Saxons our ancestors, who (after the manner of their elders) used them as

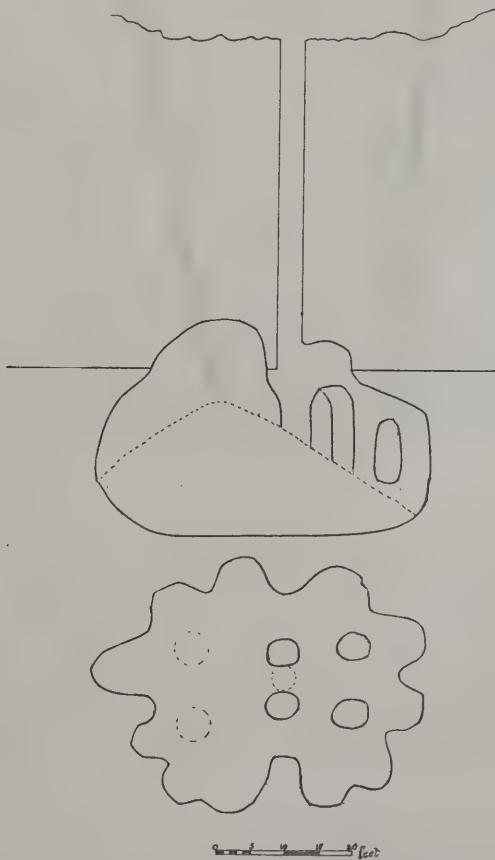
receptacles and places of secret retraits for their wives, children and portable goods, in the times both of civil dissention and foreine invasion."

Pliny says, "The Britons used to sink pits 100 feet in depth, narrow at the mouth, but within of great compass." Tacitus mentions them only as store-houses for corn and refuge from the enemy. Diodorus, Greek historian, writing of the tribes inhabiting Britain, says they gather in the harvest by cutting off the ears of corn and storing them in subterraneous repositories. Dene holes (A.S. denu=a cave, Eng. hole) consist of a vertical shaft 2 feet 6 inches to 3 feet in diameter, varying from a few feet to over one hundred feet in depth (one at Eltham is 140 feet deep), terminating in a cavern in the chalk. This is sometimes a single apartment, or, as in the deeper pits, may consist of a series of chambers symmetrically disposed round the shaft. Though generally close together the pits do not communicate. They abound in Kent north of the North Downs, and in Essex between Purfleet and East Tilbury. A few of the older and simpler pits have been explored and found to date back to the Stone Age. The deeper ones still need examination.



DENE HOLE, STANKEY WOOD.

On the Ordnance maps the word is spelled Daneholes, suggesting some connection with the Danes, and it has been seriously thought by some that these holes were made as places of refuge during Danish raids. The dene holes were undoubtedly in existence hundreds of years before the Danes made their appearance in this country, and these caverns may have been used for the purpose of concealment during the attacks of these rovers of the sea, but this could not have been their primary use.



SECTION OF DENE HOLE IN STANKEY WOOD.

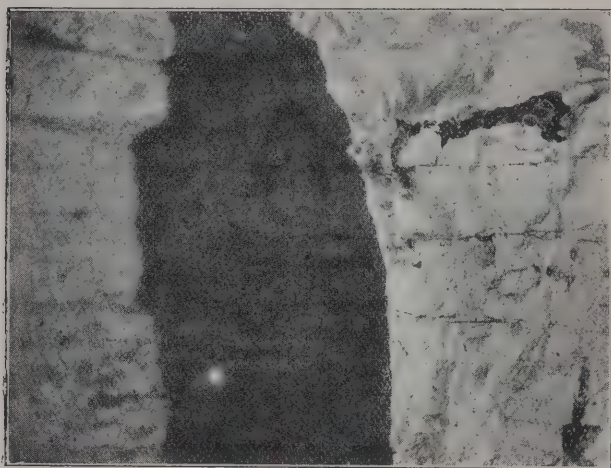
Thomas Pennant, in his Journey from Chester to London, 1811, says that the holes were merely chalk-pits, and that chalk was being obtained in precisely the same manner in his time. Camden, writing in his "Magna Britannia," is of the

\* A paper read by Mr. T. P. Wiggins before the members of the Upper Norwood Athenæum, with additional notes by Mr. W. F. Harradence and Mr. W. F. Potter.



same opinion and agrees with Pliny. Mr. J. G. Waller, F.S.A., in endorsing these opinions, says, "Opinions are a pleasant exercise of the imagination, and once entertained are hard to be given up, and of all things a simple solution of a difficulty is about the greatest offence that can be given to those entertaining them." In answer to all this Mr. T. V. Holmes F.G.S., M.A.I., writes:—"Dene holes are concentrated where there are 40 to 60 feet of other materials above the chalk, though there is in each case plenty of bare chalk within a mile; the chalk-pit hypothesis involves us in the manifest absurdity that the makers of these ancient caverns deliberately preferred to concentrate their excavations where they obtained the least return for their labour. Now it is scarcely needful to remark that no people, ancient or modern, savage or civilised, ever did anything of the kind."

Were they habitations? Mr. Miller Christy, who explored the dene holes in Hangman's Wood, near Grays Thurrock, Essex, is of opinion any race living in them would probably have been quickly exterminated by ague and rheumatism. Places of refuge: it seems to me they are hardly suitable for



INTERIOR OF DENE HOLE, STANKEY WOOD.



CAVE DWELLINGS, BALACLAVA.

this purpose unless there was some communication between adjacent pits.

On the whole it seems that the balance of evidence points to the conclusion that they were used for the storage of grain, and the absence of communication between them supports this theory, for in the event of the grain deteriorating the disease could not spread to adjoining pits. H. M. Stanley, the explorer, found similar caves used for this purpose by the natives during his journey through Central Africa, and at the present day the British Government has stored in similar receptacles seven years' supply of grain for the use of the garrison at Malta.

Mr. T. V. Holmes, writing in 1884 on the dene hole we visited, remarks:—

"Its shaft was in good preservation, the footholes at the side being very distinct. Below it presented at first sight an extremely confused appearance, the consequence of downfalls of chalk and Thanet sand from the roof, the regular dome-like shape of the spaces above, resulting from the downfalls, suggesting the thought that they must be the work of design, not of accident. But a glance at the plan of the pit given by

Mr. Spurrell, shows that we have in this example a dene hole that has not only reached the six-pillared stage, but one that is in a state of decadence owing to the removal of two of these pillars. He remarks that this removal seems to have been caused by a desire to obtain a large unobstructed space, and adds:—"The whole cave is embayed, yet rounded and symmetrical, all combining to give the idea of an excavation seeking space rather than the material excavated. The nearest cave to it on the west is within 10 feet, yet no effort in this case was made to unite them, though I have, when in one cave, heard persons knocking in the other."

He states that the greatest diameters are 49 feet and 38 feet, and the height about 25 feet. It is about 70 feet deep.

The cave is in Stankey Wood (Stanka or Stankye has the signification of digged holes). Scott, in a note on Cadyon Castle, quotes an old diary, in which he translates Stanka as ditch.

We had not decided upon the particular dene hole to be visited until Saturday morning. I originally intended to take you to one in Joyden Wood, but on inspection it was found to be in an unsuitable state. Captain Harston spent a great deal of time trying to find a larger and more perfect dene hole than the one visited by us.

The holes are very difficult to locate at this time of year, the bearings being obstructed in every direction.

An American writer once divided society into two classes, one class consisting of those who read aloud, and the other, those who were unfortunate enough to have to listen. He added the listeners generally thirsted for the blood of the reader, and as I want to get home alive to-night, I have made my paper as short as possible. With this I close my remarks, feeling sure there are many here who are more conversant with the subject than I am, and are anxious to give us the benefit of their knowledge.

To Mr. C. Harston, who very kindly gave us every facility for inspecting one of the dene holes on his estate; to Captain A. Harston, who has rendered me yeoman service above the earth and in it; to Lieutenant W. Geddes, who spent a bright afternoon underground to insure our safe transit; to Mr. J. R. Speck, who kindly took the flash-light photographs of the cave; to Mrs. Harston and her daughters, who pleasantly regaled us with an *al fresco* tea; and to other kindly helpers I tender my most grateful thanks, thanks which I know will be echoed by every member of the Society.

The illustrations are from drawings and photographs by Mr. J. R. Speck and Mr. Charles Wheeler.

(To be concluded.)

## DURHAM AND NORTHUMBERLAND ARCHÆOLOGICAL SOCIETY.

THE members of this Society held their fourth country meeting of the year at Melsonby, Stanwick and Coniscliffe, and, as usual on these occasions, there was a large attendance of members. Darlington station was the rendezvous, and driving through Darlington and its pretty suburbs and away along the country roads into Yorkshire, the first stop was made at Middleton Tyas, where there is a charmingly-situated church with a Norman arcade, and other features of interest. Continuing the drive, the picturesque ivy-clad church at Melsonby was next visited, and the party was hospitably entertained by the rector (the Rev. Henry Ellison). Amongst the attractions of the church are two beautiful coped pre-Conquest grave covers, which received admiring attention. The rector, having before him a paper on the subject written by Dr. Greenwell, said that the fact that a church was in existence at Melsonby before the Norman Conquest was shown by the remaining grave-covers and other sculptural stones of the period. However, there was nothing left of the pre-Conquest church, nor was there anything to show that there had ever been a Norman one. It was probable that the pre-Conquest church remained until the new edifice was built. This might be regarded as the work of the latter part of the twelfth century—about 1180, or a few years later. The earliest part appeared to be the south arcade of the nave, which included among the capitals of the pillars two having the Transitional volute upon them. The tower is a massive and somewhat keep-like structure, and very probably served for the purpose of temporary defence. Part of a piece of glass in the vestry may belong, so Dr. Greenwell averred, to a family of Marshalls, as a coat of arms not very unlike was used by people of that name, who were once owners of Selaby, in the parish of Gainford. From Melsonby the journey was resumed to Stanwick, the great earthworks which form one of the most remarkable examples of prehistoric fortified enclosure in the kingdom being found on the way. Unfortunately rain fell heavily at this period of the day, so that a closer view of the works was not to be obtained without discomfort, which the party did not seem ready to undergo.



Stanwick Church contains several pre-Conquest sepulchral memorials. The building is of the thirteenth century. The Rev. Henry Pollexfen (the vicar) kindly explained the interesting portions, and then a move was made for Forcett, where other pre-Conquest crosses were examined. Then, after crossing the Tees at Pierce Bridge, another halt was made at Coniscliffe. Situated on the top of a rugged precipice overlooking the river, Coniscliffe Church presents a remarkably pretty picture, and from its ramparts a lovely view of the surrounding country was obtained. The church, with the exception of the nave, clerestory and roofs, is of the Early English period, having a western tower, nave (with north aisle) and chancel, the latter being of equal height with the nave and separated from it by a beautiful equilateral pointed arch, rising to the very roof. The vicar (the Rev. J. J. Brown) and Mrs. Brown kindly provided refreshments, and then the homeward journey to Darlington was accomplished, the party dining at the North-Eastern hotel before separating for their various destinations.

### LIVERPOOL CATHEDRAL.

THE following report has been received by the executive committee of the Liverpool Cathedral committee from Mr. R. Norman Shaw, R.A., and Mr. G. F. Bodley, R.A., advisory architects, on the designs submitted in the preliminary competition:—

Gentlemen,—Of the great importance of insuring a fine design for the proposed cathedral there can be no question. Truro alone in England has had a new cathedral, the first built for many generations. Truro is but a county town, while Liverpool is one of the largest and most important of our cities.

The new cathedral must be a stately, a dignified and a beautiful building. It must be suitable for the services of the English Church and be capable of holding large congregations. All this is obvious.

The committee having determined on a competition, it is our duty to select the best designs submitted in this preliminary competition, and then to invite their authors to compete for the great work in accordance with the regulations that may be laid down for their guidance.

What seems to be necessary is a design having a distinctive character of its own, and one not without originality—a design with a striking unity of effect and idea.

We were prepared to find more designs of a Renaissance or a Classical manner. We were surprised to find so few in those styles, and those, we feel bound to say, not commanding or remarkable. The main body of the best designs sent in are Gothic. This seemed to point to Gothic as the style from which we should find it practical to select. And, indeed, that manner is accepted by most as generally the suitable one, except under especial circumstances, for church building. In making a selection there seemed no doubt but that our own English phase of the style should be adhered to.

Many of the designs sent in have plans more or less like numerous fine Mediæval cathedrals, with many chapels clustering round the eastern end of the choir. It is no doubt an arrangement of much beauty. One or two such chapels may be desirable as being very useful in bringing comparatively small congregations together for early or evening services, but many such chapels would not seem to be appropriate for the uses of the English Church. There should certainly be one or two such chapels, but we suppose not more would be needed. Modifications of many of the plans submitted would, therefore, seem to be necessary. How far what we have said on this point should be embodied in the instructions to be given for the final competition we leave to the consideration of the committee.

We feel that the object of the competition is to enable the committee to find out the best man for the work. What he submits may be thoroughly examined and discussed, and, if it seems desirable, may be modified or improved on.

The opportunity, the great opportunity, must not be lost for the erection of a really stately and a beautiful building, one of striking proportions and of delightful detail. Our old ecclesiastical buildings afford many such examples. Not, indeed, that they should be copied, for Liverpool Cathedral must be an original work of art and have a character of its own—one fitted for the requirements of the present age and one specially designed for its site. The spirit of our best architecture may, however, well be caught, and its magnificent traditions may be recovered and handed on.

Whatever style is adopted, there should be that nobility of expression and that refinement of feeling that is so characteristic of all the best architecture of the great times. We may add that a noble simplicity, enhanced by touches of beauty, is not a thing to be afraid of.

In judging the designs one must take care to discern the real effect that the building would have, and not be led away

by any clever delineation of a conception that may not be really good. This is evident, but a first impression given by a clever and beautiful drawing, even though it be of a poor design, may be misleading and deceptive.

We shall look forward with interest and pleasure to the work of reporting to the committee on the designs to be sent in for the selection of one that may be not unworthy of your important and great city of Liverpool.

There has happily been some revival of taste and knowledge of architecture in recent years, and this new cathedral should show a dawning sign of that improving state of feeling, and mark the period as one of greater advance towards the beauty and the dignity that characterised the great days of art; and, above all, it should be an example of cultured and religious feeling in church building.

With regard to the plans submitted we beg to report that we have examined the various portfolios of designs, and all the drawings that were hung on the walls, with great care and with the deepest interest. The number in all is 103; of these thirty-three are designs prepared expressly for this competition. They represent much labour, and we may also say a considerable amount of talent. Twenty-three are sent as evidence of skill and ability to design a cathedral, and consist mainly of designs which have been submitted mostly in competition for large churches in different parts of the world.

The remainder are a miscellaneous collection of photographs, drawings and sketches, partly ecclesiastical and partly secular. Though many of them are of much excellence, they do not show any evidence that their authors have any special claim to be considered aspirants for the work of building a cathedral. It is vain to shut one's eyes to the fact that many of the competitors in this last class have taken absolutely no trouble. They have simply sent in a portfolio containing few or many photographs or drawings which they happened to have by them, whereas in the cases to which we first referred, where special designs have been prepared, the competitors have, many of them, taken great care and trouble, and have done their best to respond to the invitation of the committee.

From the plans sent in we have selected five that we consider show their designers to be capable men. They give evidence of considerable knowledge of old work, great care in design and originality of a sound and practical nature. Not the originality which has little aim beyond being eccentric for the sake of being considered original, but which does not regard beauty and fitness as necessary.

These five we suggest should be asked to prepare complete designs for the cathedral, in accordance with the conditions to be laid down by the committee.

This seems a small number to name out of such a long list of competitors, but, on the other hand, it may lead to greater effort being made to conceive and delineate a fine design, and with greater hope on the part of the designer of success, and, for the world, for an ultimate and satisfactory result. These designs are numbered Nos. 20, 45A, 68, 71, 95.

In addition to the above we consider it would be a gracious act, and one that would be appreciated, to nominate a certain number for honourable mention, as a distinct recognition of considerable skill shown sometimes in planning, and sometimes in design, though we were unable to award them a still more honourable place. We selected eight, namely, Nos. 17, 37, 41, 44, 45, 46, 84 and 94 for such honourable mention.

We are, Gentlemen, faithfully yours,

G. F. BODLEY, R.A.

R. NORMAN SHAW, R.A.

London: August 1902.

The five architects referred to in the report are:—

20. Messrs. Austin & Paley, Lancaster.

45A. C. A. Nicholson, 2 New Square, Lincoln's Inn, London, W.C.

68. G. Gilbert Scott, 40 York Mansions, Battersea Park, London.

71. Malcolm Stark, 11 Little College Street, Westminster, London, S.W.

95. W. J. Tapper, 1 Raymond Buildings, Gray's Inn, London, W.C.

Those honourably mentioned are:—

17. Sir Thomas Drew, 22 Clare Street, Dublin.

37. J. Oldrid Scott, 2 Dean's Yard, London, S.W.

41. A. H. Skipworth, 5 Staple Inn, London.

44. H. C. Corlett, 2 New Square, Lincoln's Inn, London, W.C.

45. C. A. Nicholson, 2 New Square, Lincoln's Inn, London, W.C.

46. F. Walley, 1 City Walls, Grey Friars, Chester.

84. James H. Cook, 12 St. George's Crescent, Liverpool.

94. Messrs. Reilly & Peach, Victoria Mansions, 28 Victoria Street, London, S.W.

A sum of 154,114*l.* has now been promised towards the cathedral.



## THE LATE J. F. BENTLEY.

CLIENTS are not always generous in testifying to the efforts of architects to serve them, and it may therefore be well to put on record the eulogium which Cardinal Vaughan penned on the designer of his cathedral. His Eminence said:—

The Society of Architects and many experts in various branches of art have already recognised, with generous and well-merited praise, his architectural genius. The cathedral will be his monument. For myself, I have a gratification in the thought that I gave him a free hand. Having laid down certain conditions as to size, space, chapels and style, I left the rest to him. He offered me the choice between a vaulted roof and one of saucer domes: I chose the latter. He wished to build two campaniles: I said one would be enough for me. For the rest he had a free hand. A metropolitan cathedral is not as a mission or a parish church—and the economics and limitations which I think ought, in a missionary country with small resources, to prevail, as a rule, in our ordinary buildings, would defeat a great religious object were they enforced upon the architect of a cathedral.

Mr. Bentley went to Italy to study the Roman and Byzantine styles. Rome, Palermo, Ravenna, Milan, Venice and Sancta Sophia furnished him with object lessons. What he saw and took in he steadily digested, and then, after a mental process that went on quietly and silently for months, he poured out rapidly on paper his matured conception of a Byzantine cathedral, and presented his plans, complete in all their wondrous lines and details, exactly as they have been carried out.

Mr. Bentley was a poet; he saw and felt the beauty, the fancy, the harmony and meaning of his artistic creations. He had no love of money, he cared little for economy; he had an immense love of art, a passion for truth and sincerity in his work. He was not ambitious to get on, he was not self-assertive, but he coveted to do well. He went in search of no work, but waited for the work to come in search of him. He was exquisitely gentle and considerate in dealing with suggestions and objections, but he would have his own way whenever it was a question of fidelity to his standard of artistic execution. I would not have singled him out to build cheap churches and schools, but he was the best of architects for a cathedral or for any work that was to excel in artistic beauty. He was no mere copyist and no slave to tradition. Whatever he produced was stamped with his own individuality, it was alive and original, and he had a genius for taking infinite pains with detail.

His reverence for God, for our Lord, His Blessed Mother and the saints pervaded everything he did for the Church. In his judgments on art and style there was a critical but a kindly humour; one always felt that there were an elevation and inspiration in his mind and character that were due to his religious instincts and to his unworldly standard of life. It seems to me that it will be necessary for the perfection of the work Mr. Bentley has left behind him, to retain his mind as a guide to its completion, as far as we can know it. We know what happened to St. Peter's and to other buildings in which the plan and the genius of the original architect were departed from. Let us maintain the main idea and the unity of Bentley's work to the end.

I am very glad to have known the man and to have been associated with him in the great work of his life. I am grateful that he lived to see the cathedral covered in and that he has left much on paper that we shall need. I shall always pray for him in case he need our prayers; and I recommend his soul to the prayers of all.

## TESSERÆ.

## Opie's Last Days.

WHEN Opie had finished his course of Academy lectures, Mr. Prince Hoare requested an article for his periodical paper called the *Artist*. "I am tired," such was his answer, "I am tired of writing. I shall be a gentleman during the spring months, keep a horse and ride out every morning." This vision of happiness, such as it was, he lived not to realise. He was attacked by a slow and a consuming illness which baffled the knowledge of five skilful doctors; Pitcairn and Baillie were of the number. They were unable to cure or even to comprehend it. When it was known that he was seriously ill, his friends, and they were numerous and respectable, came round him with affectionate solicitude. Amongst those that he loved most was Henry Thompson, and to him he confided the finishing of the robes of the Duke of Gloucester's portrait. On Saturday, when the pictures were to be delivered for the exhibition at Somerset House, the picture of the royal duke was placed at the foot of his bed. A fit of delirium had subsided; he lifted his head and said, "There is not colour enough on the back ground." More colour was added; Opie looked at it with great satisfaction and said with a smile, "Thompson, it

will do now—it will do now; if you could not do it nobody could." The delirium returned and took its hue from the picture he had just looked at. He imagined himself employed in his favourite pursuit, and continued painting in idea till death interposed on Thursday, April 9, 1807. On dissection the lower part of the spinal marrow and its investing membrane were found slightly inflamed, and the brain surcharged with blood. On Monday, April 20, he was interred in St. Paul's Cathedral, near Sir Joshua Reynolds. In person Opie looked like an inspired peasant; even in his most courtly days there was a country air about him, and he was abrupt in his language and careless in his dress, without being conscious of either. His looks savoured of melancholy—some have said of moroseness; the portrait which he has left of himself shows a noble forehead and an intellectual eye. There are few who cannot feel his talents, and all must admire his fortitude. He came coarse and uneducated from the country into the polished circles of London, was caressed, invited, praised and patronised for one little year or so, and then the giddy tide of fashion receded; but he was not left a wreck. He had that strength of mind which triumphs over despair. He estimated the patronage of fickle ignorance at what it was worth, and lived to invest his name with a brighter as well as steadier halo than that of fashionable wonder.

## The Veiled Face of Agamemnon.

In 1778 "The Sacrifice of Iphigenia" was assigned as the subject of the competition in painting for the students of painting in the Royal Academy. Reynolds observed that "every candidate has copied the celebrated invention of Timanthes in hiding the face of Agamemnon in his mantle, and that the adoption can neither be wondered at nor blamed." Timanthes felt like a father. He did not hide the face of Agamemnon because it was beyond the power of his art, nor because it was beyond the possibility, but because it was beyond the dignity of expression, because the inspiring feature of paternal affection at that moment, and the action which of necessity must have accompanied it, would either have destroyed the grandeur of the character and the solemnity of the scene or subjected the painter, with the majority of his judges, to the imputation of insensibility. He must either have represented him in tears or convulsed at the flash of the raised dagger, forgetting the chief in the father, or shown him absorbed by despair and in that state of stupefaction which levels all features and deadens expression. He might, indeed, have chosen a fourth mode: he might have exhibited him fainting and palsied in the arms of his attendants, and by this confusion of male and female character merited the applause of every theatre in Paris. But Timanthes had too true a sense of nature to expose a father's feelings or to tear a passion to rags, nor had the Greeks yet learnt of Rome to steel the face. If he made Agamemnon bear his calamity as a man, he made him also feel it as a man. It became the leader of Greece to sanction the ceremony with his presence; it did not become the father to see his daughter beneath the dagger's point. The arrangement is certainly one that "has served more than once." We find it adopted to express the grief of a beautiful female figure on a basso-relievo formerly in the Palace Valle at Rome, and preserved in the Admiranda of S. Bartoli; it is used, though with his own originality, by Michel Angelo in the figure of Abijam to mark unutterable woe; Raphael, to show that he thought it the best possible mode of expressing remorse and the deepest sense of repentance, borrowed it in the expulsion from Paradise, without any alteration, from Masaccio, and like him, turned Adam out with both his hands before his face. And how has he represented Moses at the burning bush, to express the astonished awe of human in the visible presence of divine nature? by a double repetition of the same expedient; once in the ceiling of a Stanza, and again in the Loggia of the Vatican, with both his hands before his face, or rather with his face immersed in his hands. As we cannot suspect in the master of expression the unworthy motive of making use of this mode merely to avoid a difficulty, or to denote the insupportable splendour of the vision, which was so far from being the case that, according to the sacred record, Moses stepped out of his way to examine the ineffectual blaze, we must conclude that nature herself dictated to him this method as superior to all he could express by features; and that he recognised the same dictate in Masaccio, who can no more be supposed to have been acquainted with the precedent of Timanthes than Shakespeare with that of Euripides, when he made Macduff draw his hat over his face. Masaccio and Raphael proceeded on the principle, Gherard Lairesse copied only the image of Timanthes, and has perhaps incurred by it the charge of what Longinus calls *parenthyrsos*, in the ill-timed application of supreme pathos to an inadequate call. Agamemnon is introduced covering his face with his mantle at the death of Polyxena, the captive daughter of Priam, sacrificed to the manes of Achilles.



## SANATORIA FOR CONSUMPTIVES.\*

*(Concluded from last week.)*

THE next building to describe is one of quite another type of plan. The Städtisches Sanatorium at Harlaching is a few miles drive from Munich, on the top of a hill, in a fir forest. This building may be described as a hospital. It is primarily for consumptives, but a few other cases of non-infectious character are received. They also make a specialty of dental surgery, and the dental operating-room is fitted with every kind of the most modern dental appliances. Accommodation is provided for 212 patients, half of each sex, but the ultimate scheme is to add buildings so as to accommodate 600 patients. There is the medical superintendent and three assistant medical officers. The remaining staff consists of a manager, a legal clerk, a clerk and one matron. There are twenty-one female nurses (members of a sisterhood), two male attendants. Of servants there are nine female and eight male, including engineering staff. The hospital is a building E-shaped on plan, three storeys in height, with, I am glad to say, no basement rooms. Its main entrance frontage is towards the north. There are twenty-eight wards, six with twenty beds, six with twelve beds, twelve with single beds, and eight isolation rooms, each with one bed, but I think some of these last named are appropriated for three-bed wards. The cubic capacity per patient is 36·36 metres.

There are four staircases, two near the centre and one at each end, and one lift. The windows reach nearly to the ceiling. There are twelve slipper baths and three douches, two slipper and one douche at each extreme angle, all contained in one room divided by partitions. There are eighteen w.c.'s for patients badly arranged, each group of three with a slop sink being placed in one room in the body of the building, with only one window. It is surprising to find such an arrangement in these modern buildings, an arrangement which the medical superintendents all condemn and lament.

The aspect of the wards is as follows:—The twenty-bed wards are axially east and west, with windows north and south. On the south side of the wards, three storeys high, are the Liegehallen, about 12 feet wide. Dr. Hermann thinks these very conveniently placed, but too wide, and owing to the fact that they are of solid masonry, arcuated on each floor, they keep off too much sun. Had they been 9 feet wide, with pillar construction, they would, he thinks, have been admirable. There are other Liegehallen in the grounds.

The twelve-bed wards are north and south, with windows east and west. The single-bed wards face east or west respectively, the isolation rooms north.

The floors of the wards are of concrete covered with linoleum. Walls and ceilings are plastered. No angles are rounded, a fact of which the doctor complains.

Ventilation when windows are closed is by means of warmed air inlet and by outlet shafts. Time is too short to allow me to describe these in detail. The fresh air is warmed by passing through a case containing a steam radiator, but Dr. Hermann, the medical superintendent, complains that the air so heated is too dry. To me this statement was interesting, because I have always had this objection to steam radiators for heating such inlets. The same result does not arise when hot water is used. The lighting is by electricity and all the clocks are electric.

The day accommodation for patients is excellent. There are two adjacent dining-rooms in the centre for the two sexes, looking into the large quadrangles, and a reading-room to the south of the dining-rooms. There are two handsome chapels, one for Roman Catholics, one for Protestants. The administrative block is north of the sanatorium. It is said to be sufficient for the ultimate scheme. The plan is very complete and admirable. There are, however, two points I venture to criticise, and these are:—(1) Placing the linen-drying rooms over the wash-house and finishing room. (2) Placing the disinfectant in the basement of the main block.

The plan of the whole is a hollow square surrounding an open quadrangle. The south block contains the doctors' and priest's residences. On the south-west is the laundry; on the south-east are the kitchens, with dining-rooms attached for female staff, and the residences of the assistant matrons and nursing sisters. The west side contains the residence of the manager, servants and engineer, and to the north of these the cow and pig stables, poultry-house, &c., with fodder lofts above. The east side contains the stables, coach-houses, &c.

The boiler-house and engineer's department are in the centre of the quad. The main basement contains heating apparatus, disinfectant and very extensive cellarage. The cow stable is a regular feature at most of the sanatoria, and those I have seen are beautifully kept. The importance of pure milk is evidently fully recognised.

We turn to yet another type of plan in the Volksheilstatte

Krailling, about half an hour's walk from Planegg, in Bavaria. The whole district is a forest, principally of pines, and the Volksheilstatte is beautifully placed, and seems the ideal abode of rest and seclusion. This is strictly a sanatorium for open-air treatment of men only. It receives 120 patients. There is a chief medical officer with two assistants. The matron does the correspondence, otherwise the institution is managed from Munich. There are twelve nursing sisters and three male attendants. There are twenty-one servants in all, male and female. The sanatorium contains a basement and three other storeys. It consists of a central block with two wings at widely obtuse angles, and at the south-east and south-west intersections there are pretty chapels for Roman Catholics and Protestants respectively. There are patients' rooms containing 109 beds; thirteen rooms have single beds, fourteen have two beds, six have three beds, two have four beds, six have five and two have six; but 120 patients can be accommodated if necessary. The cubic space in single bedrooms is 50 metres, in other rooms from 30 to 33 metres per patient. There are two staircases. The doors have fanlights, but not to the ceiling. All patients' rooms face south, and of the multi-bedded rooms there are four with side windows. There is an unobstructed corridor on the north side of the rooms in the wings. The kitchen is in the basement of the central block, the dining-room being on the ground floor on the south side, with a sitting-room adjacent. There are four slipper-baths in one room on the ground floor, divided by curtains, and one douche room. There are eighteen water-closets in groups of three arranged on each floor in one room in the heart of the building, with only one window. There is on each of the upper floors a room fitted with lavatory basins on both sides. In all there are thirty basins, the best accommodation I have seen in any sanatorium. The floors of all rooms are covered with linoleum. The walls and ceilings are of plaster with concave angles, except at floors, the omission of which is of course complained of. The patients' bedrooms are all on the first and second floors. The northern side of the ground floor of the west wing contains the matron's and nurses' rooms; that of the east wing the consulting-room, laboratory, doctors' bath-room and the patients' baths. On the south of these are corridors, and south of these again are the Liegehallen, about 3 metres wide. These form a structural arcaded verandah beneath the patients' bedrooms. There is also a Liegehalle 78 metres long in the woods, fitted with eighty couches. The medical officers' rooms are on the north side of the central block, with a committee-room on the first floor. At some distance east of the sanatorium is an administrative block connected by a subway. This block consists of basement and three other storeys. It contains the boiler and engine-houses, disinfectant, accumulator-room, laundry, stables for cows and horses, and residences for the remaining staff and female servants.

I conclude the description of German sanatoria with that of the Nordrach colony in the Black Forest, nine miles from the little station of Biberach. To describe this colony one must picture the locality. The road from the railway ascends, and for some miles follows the river Hammerbach. The scenery is beautiful. On either side the hills covered with trees slope up from the river, sometimes gently, sometimes in bold escarpments. In the grey distance they rise to small mountainous heights dotted everywhere with trees, save for patches of greensward. In the midst the rapid river sparkling in the sun, which on the day of my visit also glistened on the snow-clad trees. Rising ultimately to a height of about 1,500 feet above the sea, we passed through Nordrach, and some half-mile or more beyond we come to Dr. Walther's famous colony for consumptives. Here there is no sanatorium proper, but many small buildings dotted about the hill-side. We alight at one containing the office and kitchens, with a long dining-room for patients attached—a wooden structure, simple enough in character, with windows on both sides—and a gravel terrace on one side. High up the hill to the left is the largest building of three storeys, containing rooms for twenty patients. It consists of a long centre, with two short wings at obtuse angles of some 190 degrees, so that they face to the S.S.E. and S.S.W. At the intersection of the angles are hexagonal turrets. There are two staircases. In this building, as in the others, each patient has a separate bedroom of about 50 cubic metres capacity. All have single casements with fan-lights, which latter are hung at the top and open outwards. There are balconies to some of the rooms. Each bedroom is fitted with a douche bath supplied with hot and cold water; there are only two slipper baths altogether, and these are solely used for medical purposes; there is one w.c. for every ten patients placed within the building. The floors are of wood covered with linoleum.

The walls and ceilings are of narrow boards, beaded not only at the edges but on the solid parts, and there is a moulded wooden cornice; there are no concave angles. It is strange that all canons of smooth surfaces and rounded angles are here set at naught; the explanation probably is that there is no dust in the place. I have before noted that each bedroom is fitted

\* A paper by Mr. Edwin T. Hall, F.R.I.B.A., read at the Congress of the Sanitary Institute at Manchester.



with two lavatory basins, one for washing, one for sputum. There are a few ordinary summer-houses in the grounds.

Another building of two storeys is provided for sixteen patients, and the rooms are only about 8 feet high. It is not only electrically lighted, but heated by electric radiators of the doctor's own manufacture. The medical staff consists of Dr. Walthers and another physician of equal standing; there is a secretary; there are no nurses as such, the doctor holding that nursing, as we know it, "ought to be done by the medical men;" there are two female servants to every ten bedrooms. In parenthesis it may be interesting to know that Dr. Walthers strongly objects to the Plenum system of ventilation, about which we have lately heard a good deal, of which he has had experience.

There are various other buildings forming the colony, dotted about here and there. Among them is the doctor's house, with the sitting-room made so that in the summer one external wall or enclosure can be completely removed. It will be seen from the foregoing that Nordrach has nothing of the structural sanatorium about it. It is a hamlet on a mountain side, "far from the madding crowd." Nature provides varied refreshment for the body and mind. For the rest, it is a little world where patients place themselves under a medical man of strong masterful personality, who orders their being generally. To live in such a position a life of simplicity under hygienic rules, to have no cares and to be interested, is to be, as nearly as our mortal frame will permit, free of disease. We have, however, to deal not with such an ideal place and life, but with the work-a-day world. For ordinary mortals, and specially for those of our poorer brethren, we must bring to their aid everything that sanitary knowledge of building can give.

It may now be of interest to briefly describe a few modern English institutions. I have had the pleasure of visiting the sanatorium near Crookesbury Ridges, under the direction of Dr. J. Rufenacht Walters. The sanatorium consists of two one-storeyed pavilions, one of eight and one of twelve single bedrooms facing south, all with French casement windows opening on to a verandah, canvas covered, for reclining couches; corridors run the whole length behind the rooms. There are two nurses living in the buildings and one masseuse. The cubic capacity of the rooms per patient is about 1,100 feet; the floors are of wood covered with linoleum; the walls and ceilings are of plaster with slightly concave angles. The ventilation is by the windows, by inlet tubes and by shafts at ceiling level across the corridor to the north. In the newer eight-bed block there are fanlights to the doors, so that all the room may be scoured with air; there are four bath-rooms, two having needle baths; the dining-room is attached to the older pavilion opening from the corridor, and beyond it are the kitchen and offices; the heating is by hot-water radiators; the lighting is by electricity. It might here be opportune to consider the question of the best position for Liegehallen or reclining verandahs. There is some difference of English medical opinion on the subject. It is held by some, and it seems to be a sound doctrine, that if patients are so delicate that they must lie down the greater part of the day, they should be as near to the medical man and to their own bedrooms as possible, so as to save the strain of even a short walk. In three of the five typical German buildings described, the Liegehallen form verandahs to the actual buildings, and the convenience of these is approved by the medical chiefs of all. In one of the others there are reasons of planning why this cannot be done. At Crookesbury Ridges the same verandah scheme is adopted and approved.

A larger institution is that called Pinewood, at Wokingham. This has accommodation for sixty-four patients, each in a single bedroom of an average cubic capacity of 1,100 feet. The institution consists of a central block of three storeys containing the consulting-rooms, offices and dispensary, with residences for the medical staff above. Detached from this on either hand is a patients' block of two storeys, each block containing thirty-two single bedrooms. These blocks face S.S.E. and S.S.W., and each has a corridor on the inner or northern side. There is one staircase in each. The ground floor walls are of brick, the first floor is enclosed by wood framing covered with boards and tiles. There is one resident nurse in each block. The douche and slipper bath-rooms and w.c.'s are on the north side of the corridor, and open directly from it. The windows are single casements which do not reach the ceiling. The doors have no fan-lights. There are no verandahs or balconies. The floors are boarded and covered with linoleum. Walls and ceilings are of plaster. There are concave angles, except to floors, where angle fillets are fixed. The heating of rooms is by open fires, that of corridors by hot-water radiators. Lighting is by electricity. The administrative block is detached to the north; it contains a handsome dining-room, with service and nurses' rooms attached, kitchen and offices (with female staff bedrooms over) and other rooms adjacent. There is a laundry block with disinfectant, an engine-house, stables, &c.

I may now perhaps describe a sanatorium which the

Brompton Consumptive Hospital is erecting at Frimley, in Surrey, from my designs. It is to accommodate 100 patients and unlike the others it is for non-paying inmates. The site is high and well wooded with fir trees. There are forty-eight single bedrooms, eight with two beds and twelve with three beds. Every patient's room will face S., S.S.E., or S.S.W. Outside the central block is a wide paved terrace. It will be noted that we have provided a large number of single bedrooms and in other rooms have fixed our maximum at three beds. Many of the German doctors with whom I have discussed the question favour this as the maximum. The sanatorium proper or patients' block, consists of a central building three storeys high with four radial wings or pavilions two storeys high, all built of brick, the upper storey tile-hung on the brick, the roof being also tile covered. All wings are practically detached and in a pine country this tends to limit the risks of fire and consequent danger to patients. By this arrangement of plan any one floor of the two or four wings may be appropriated to women, leaving the others for men; each group is self-contained with its separate sanitary conveniences. This plan also affords much greater facilities for classification than could be found in one building of the ordinary type. The main entrance hall is in the centre, and behind it is a day-room facing south with two three-bed wards at the sides. East and west of the hall are the consulting and matron's rooms, dispensary and sisters' duty-room. The first floor has similar patients' and sisters' accommodation, a committee-room, a residence for the matron, rooms for the sisters and a maids' room. Overhead, in the roof, are bedrooms, &c., for female servants, with their bath-rooms, &c. The pavilions are connected to the centre by enclosed corridors having windows on both sides. Each wing contains twenty-two beds. The corridor on the north side has no obstruction whatever to light and air.

Opposite every room door there is a window in the corridor, and as all doors have fan-lights carried, like the windows, to the ceiling, we shall get thorough ventilation, and even on hot sultry days the cooler air on the north side of the building will induce a current to the hotter south side. The windows are casements, those on the ground floor opening to the floor so that if necessary beds may be wheeled out. The casements on the ground floor are so constructed as to keep out rats and other vermin while the windows may remain wide-open. On the first floor there will be outside jalousie shutters, which can be closed either to exclude rain or intense sun heat, the windows remaining open. On the ground floor rolling canvas blinds, like those over shops, will effect not only the same purpose, but will shelter beds or couches outside. By this means we get the advantages of a verandah without any of its drawbacks. On each floor are large linen rooms, and on the ground floor are boot rooms. Between each pair of pavilions is a sanitary tower, detached except for a cross ventilated lobby. This contains all the patients' w.c.'s, baths, lavatories and housemaids' closets. For the nursing staff on duty separate ward kitchens, lavatories and w.c.'s are provided on both floors. There are separate entrances to each pair of pavilions, two main staircases, and at the outer end of each pavilion a fire escape staircase. The heating generally will be by hot water, the lighting by electricity.

The floors will be of wood covered with linoleum, and all walls and ceilings will be of plaster with concave angles everywhere. To the north of the sanatorium proper are the two patients' dining-rooms and a general assembly hall. Behind are the kitchen block, female servants' hall, men's rooms, &c. At the east end is the nurses' home, at the west the medical officers' and men-servants' residence. Nearer the main road are the laundry, boiler and electrical engine-houses, electrical ambulance house, mortuary and gate lodge. There are two laboratories.

I also show another of my designs for a rather smaller institution for paying patients, all having separate bedrooms. This is intended for males and females in equal numbers. Each side is separately entered, is self-contained, and has its separate recreation-room and writing-room or library. The central hall is arranged as a common-room for concerts or assemblies, and a billiard-room is provided on the first floor. Each wing consists of two floors of twenty-two rooms with principal and emergency staircases at either end and two sanitary towers, one containing w.c.'s and lavatories, the other baths and hair-dressing rooms. In the centre is a separately entered staff annexe, with linen-room, larder, &c., in close proximity to the nurses' duty-room. The rooms are in single file, every one with a sunny aspect, their construction following closely that already described. To the north of the main block is one large dining-hall for all patients, separated from the kitchen block by a serving-room. The kitchen forms the centre of another block, and around it are grouped dining-rooms for male and female servants, the stores, scullery, larders, &c. The residence of assistant medical officers and men servants is to the west and that of the nurses to the east. The medical superintendent will have a separate house.

Lastly, may I be permitted to refer to the new Camberwell Infirmary in course of erection from my designs? There will



be 800 beds in the institution. My reason for mentioning it here is that the Board of Guardians have, on the advice of the medical superintendent, Dr. Keats, and myself, made special provision for tuberculosis patients. We have three large wards of twenty-four beds each, in which practically the whole length of the walls on three sides is made to open, so that the patients may be said to lie in the open air, and above the wards are flat roofs with easy access, so that some patients can be actually in the open air all day long.

As far as I am aware, this is the first poor-law institution in the kingdom where this has been done, and we hope it may be the means of bringing open-air treatment to the poor at their own doors in a practical way.

In conclusion, I hope that in laying before you practical examples of many erected buildings you may have been interested in a way that a merely theoretical treatise could not interest you. You have seen very varied types of buildings and among them some of the most recent.

The principles laid down are submitted with all diffidence, but they are the result of close personal study of the subject and of the best modern buildings and conferences with the experienced medical officers who manage them. I trust that so much detail has not wearied you, but my wish has been to lay before you all the information in my power.

### THE PROVISION AND CONSTRUCTION OF SANATORIA FOR PULMONARY TUBERCULOSIS.\*

THE present-day treatment of tuberculous diseases of the lungs, commonly called consumption, is radically different to that formerly in vogue, when patients were protected from the imaginary dangers of fresh air, and were compelled to spend their days in an impure and overheated atmosphere, in which their vigour and strength progressively departed. As there was no knowledge of the causes of the disease, no precautions against infection were taken, and the unhappy attendants who had to breathe the vitiated and used-up air of the foetid sick room frequently themselves fell victims to the innumerable bacilli which swarmed in the dust of the room. Dr. Buhmer, of Gorborsdorf, in 1859 first practically demonstrated the value of fresh air by the successful results obtained in his sanatorium, and many sanatoria have been established abroad, and latterly in our own country on the same lines.

In such institutions the patient spends his whole time in the fresh air, protected from winds and draughts. Rest, both mental and physical, is insisted upon with judicious overfeeding. The discipline enforced is of the greatest value, and the whole of the patients' existence is regulated and supervised by his medical director, whom he learns to obey implicitly.

An ideal sanatorium cannot be designed on a cramped site, and not only should the site be ample enough to allow the buildings to be arranged to the best possible advantage, but there should also be grass land around to insure the absence of dust and to afford room for walks and exercise. A sanatorium for consumption must be considered as a specially designed hospital in which an infectious disease is to be treated.

"In order to facilitate the maintenance of healthy conditions in a hospital the form of the building should be such as to insure the provision and proper application of (1) fresh air, with the necessary warmth and coolness; (2) ample light, including the penetration of sunlight to every part; (3) purification of floors and walls." These words of Sir Douglas Galton will apply with even greater force to sanatoria, and in an ideal building the following requirements are essential:—(a) Free play of sunlight upon each room and block of buildings provided for the patients' accommodation. (b) The freest possible circulation of air around each building, and the avoidance of all enclosed spaces in which air would be liable to become stagnant. (c) Ample space between the various buildings. (d) Facilities for enabling the patients to spend the greater part of each day in the open air. (e) Sufficient compactness of plan to allow of all departments being placed within reasonable distance of the administrative centre, which should be separated from the patients' quarters. (f) Isolation of the engine and boiler house, the laundry, mortuary and other subsidiary buildings. (g) Departmental separation of male and female patients, whose quarters and exercise grounds should be placed on either side of a central administrative block.

Most of the sanatoria which have been built abroad fall very short of the ideal. Large piles of buildings have been placed on limited sites, and although imposing and grandiose, lack the essential qualifications of allowing free circulation of light and air. Such sanatoria resemble nothing so much as palatial hotels, and however skilfully they may be planned and

however pleasing may be their appearance, they are rightly condemned by present-day opinion. It is, however, a fact that a design which admits of a striking elevation will always command support, however imperfectly the objects are subserved for which the building is intended, and quite recently, in one of the medical journals, a most laudatory account of the Wehrawald Sanatori was given by an eminent physician, who described this sanatorium as ideal, although it is five storeys in height and includes all the defects of a palatial hotel, both as regards ventilation and overcrowding.

Fortunately the expense of building such palatial sanatoria militates against their adoption, and through lack of money public bodies may be induced to build cheaper and more perfect sanatoria.

The best type of sanatorium for small numbers probably is one built on the village system in which the patients live in detached chalets, which are grouped around a central administrative block. Not only is free circulation of air and light promoted, but there is no institution look about the place. The patients feel more at home and scarcely realise that they are in a hospital. But such a plan is not the best for a sanatorium containing 100 or more patients, as the labour of supervision and administration in a public institution consisting of a multitude of detached units, together with the expense of maintenance, would be prohibitive.

A compromise may be effected by planning a series of pavilions, each consisting of a one-storeyed row of single rooms, completely surrounded by a verandah, with their long axes radiating from the central administrative block with which they are connected by a wide open corridor. Such a sanatorium has all the advantages of free circulation of air and light which the sanatorium of the "village" type possesses, while it is as easily administered and supervised as a large hotel.

The drawings which we exhibit to-day constitute an attempt to design a sanatorium of this type, to give accommodation to eighty-eight patients of the usual hospital class, and to twelve paying patients who require better accommodation.

Provision has been made for an administrative block, arranged with the object of interfering as little as possible with the free circulation of air and sunshine. The front is two storeys in height and has a southern aspect. Behind this building is a long range of one-storeyed buildings, the principal rooms of which are lighted by lantern lights in addition to the usual side windows. The boiler-house, laundry, &c., forming the centre of the semicircular plan, are placed at the extreme north end of the central block. Then pavilions containing sleeping-rooms radiate on either side, and an open corridor connects them with one another and with the administrative building. Twelve separate chalets for the accommodation of better-class patients are placed between the pavilions and the front administrative building.

The stereotyped design seen in so many asylums and hospitals has been carefully avoided. A good æsthetic result may be obtained without the employment of costly stone quoins, cornices, and so-called enrichments. The bungalow type of building appears to be the best for our purpose and the elevations conform to the plan. Without going into detail we may say that in a sanatorium all the usual precautions against dirt and dust, such as rounded corners, hard impermeable walls, terazzo or teak flooring would be required. We have time only to give a very hurried sketch of the plan.

In the front administrative block on the ground floor spacious dining, drawing, reading and recreation-rooms for the use of the better-class patients open into a large central hall. On the first floor are bedrooms for the matron and nurses, and on the attic floor, approached by separate staircases, sleeping accommodation is provided for the servants of either sex.

The kitchen occupies a central position between the dining-rooms allotted (a) to the patients, (b) to the nurses, and to the servants. An extraction fan placed in a large lantern light insures thorough ventilation, and in order to obviate the possibility of any cooking fumes permeating into the adjacent passages, it is approached through well-ventilated lobbies, placed at either end, and forming the necessary serving rooms in connection with the kitchen. On either side are the necessary provision and store rooms, and surrounding the building in front is a wide covered verandah, which is prolonged on either side into a raised terrace. On the west side an annexe is provided for medical work. This comprises patients' waiting and dressing-rooms, consulting-room, and an inner room for physical diagnosis. On the opposite side of a central passage are the laboratories, together with a dark-room and an animal-room. Overlooking the terrace are rooms for an assistant medical officer, and the dispensary and general office. On the east side a corresponding annexe contains the nurses' dining and day-rooms. Dining-rooms for the patients and servants, recreation-rooms, including a library, a large winter garden, and a chapel are provided in the main central block. The main corridor is centrally placed, and connects the pavilions with one another. This corridor, open at the sides, is on the same

\* A paper by Mr. A. W. S. Cross, B.A. Cantab., F.R.I.B.A., and Mr. A. G. Walsford, M.D., read at the Sanitary Congress, Manchester.



level as that of the floors of the pavilions, and beneath it is a subway for pipes, &c.

On either side of the administrative buildings three separate pavilions, each containing 15 rooms, are placed with their long axes radiating from the centre of the plan, and planned as separate and independent blocks, communicating by an open covered way with the main corridor. Each room is provided with an open fireplace. Each pavilion is surrounded by a wide verandah, and the rooms open on to it by French windows or doors, which to prevent direct draught may be double, as efficient ventilation is assured by windows consisting of fixed glass louveres above the verandah roof. As these cannot be closed constant and efficient ventilation is provided without the use of pipes and tubes which collect dust, and are often worse than useless. Outside the windows jalousie framed shutters are provided for use in very boisterous weather.

The verandah is enclosed with glass at one end, to form a sun room, but with this exception it is entirely open, and unless the weather were very inclement the windows of the sun room would be always open. The verandah roof is glazed with thick unpolished plate-glass, through which the sun's rays will not penetrate with full force. Each room has a floor area of 15 feet by 12 feet and a clear height of 14 feet. This gives a cubic capacity for each patient of more than 2,500 feet.

Each pavilion practically consists of a row of one-roomed chalets, the verandahs of which communicate. This gives the opportunity to patients to obtain the full benefit of the open-air treatment as regards sunshine and fresh air. The better-class patients are housed in separate chalets.

Between the pavilions and the main building is a building containing a douche-room and a room in which special inhalations can be given. A glass room for the sun-bath treatment is provided. Fronting the main back road is a detached building containing the boiler-house, pump-room, the laundry and the disinfectant and destructor. Surrounding the boiler-house and laundry block is a wide road for vehicular traffic, in connection with which is a branch inclined roadway, leading to a subway connecting the back with the front of the administrative buildings. The subway runs from north to south, and is of sufficient width to allow of a trolley service for the carriage of coals and provisions which would be brought in at the back entrance and conveyed to the kitchen.

The open corridors afford ready access to all parts of the sanatorium without interfering with the circulation of air. The principal medical officer's house is within easy reach of the sanatorium, but separate from it. The grounds would be laid out with covered and open, level and inclined paths, and with the usual desiderata of a well-appointed sanatorium, into the details of which we cannot enter now.

From this hasty account it will be readily seen that in such a sanatorium the open-air treatment can be thoroughly carried out. As one-storeyed buildings can so easily be ventilated there is no necessity to forbid the provision of recreation-rooms, which in our climate are a necessity. The recreation-rooms provided for in our plan are so thoroughly ventilated that no objection can be raised to allowing patients to use them at any rate during part of the day.

While we have designed a sanatorium on a large scale it is obvious that, without departing from the spirit of the plan, the sanatorium may be made much less expensive by omitting to provide so many recreation-rooms. A sanatorium built on the plan suggested can be made as simple and as small or as large as is required, and meets all requirements, while, when compared with sanatoria of the "palatial hotel type," it compares very favourably as to cost. No doubt the area covered by the buildings is large; but this is desirable, as free circulation of air is necessary. The spaces intervening between the buildings should be laid out with walks and as gardens, so that the whole will have a most pleasing appearance.

## GENERAL.

**The Design** by Mr. D. Forbes Smith, A.R.I.B.A., has been unanimously selected by the Kirkcaldy and Dysart Landward School Board for a new school at Boneland in a competition limited to the architects of the district.

**The Bruges Exhibition** of early Flemish art, which was to have closed on the 15th inst., is to remain open till October 5. This is the consequence of its very great success, which has been most remarkable. Lately the visitors have numbered 500 or 600 daily, and the town has been crowded throughout the summer.

**Percy Broughton**, who pleaded guilty at Belfast to stealing several South Kensington Museum art treasures from the local free library, was liberated last week under the First Offenders Act.

**Falguière's Statue of Balzac** has been erected in the street bearing the novelist's name, where he lived, but it will not be unveiled till next year.

**Sir John Knill** was elected Master of the Worshipful Company of Plumbers on Tuesday for the ensuing year. The other appointments were Mr. Robert Crawford, Warden, and Alderman Richard Hind, Renter-Warden.

**The Street Improvements** in the neighbourhood of the French Institute in Paris, which would require a new bridge over the Seine as part of the project, are not likely to be undertaken at present.

**The Woolwich Town Council** is about to complete the purchase of the works and undertaking of the local electric lighting company. In accordance with the contract already signed, the purchase price is 101,000*l.* This sum will be sufficient to return to the shareholders considerably over 2*l.* for each 1*l.* share.

**M. Gustave Wertheimer**, the French animal-painter, has died in a Paris hospital of consumption.

**The Excavations** which are to be made at Bury St. Edmunds are undertaken for the purpose of discovering the crypt in which the body of St. Edmund was buried by the monks when they were warned of the coming dissolution of the monastery.

**The Acme Wood Flooring Company** announce that notwithstanding the fire at their Victoria Dock wharf and saw mills, the execution of orders in hand and the booking and carrying out of further orders will in no way be interfered with, arrangements to insure this having been made at other mills.

**The First Section** of the new St. Matthew's Church, Southsea, which will accommodate a thousand people, was formally opened on Saturday night at eight o'clock with solemn evensong and procession. There was a large congregation. Mr. J. T. Micklethwaite, F.S.A., is the architect of the church.

**The Natal Government**, it is said, is about to spend 50,000*l.* on public buildings in Vryheid, which was recently annexed from the Transvaal. These are to comprise a new court-house, new post and telegraph offices and other buildings, including a police-station and charge office.

**Messrs. Colson, Farrow & Nisbett**, architects, request us to announce that they have removed from New Court, Carey Street, W.C., to 29 New Bridge Street, E.C., and that their telephone number is now 741, Holborn.

**The Ashwell Rural District Council** have resolved to appoint a parochial committee to carry out the water and drainage schemes for Ashwell prepared by Mr. J. R. Elliott, A.M.I.C.E., of Nottingham. The schemes have been unanimously approved by the Parish and District Councils, and application has been made for a loan of 5,000*l.*

**A Permanent Seamen's Institute**, for the use of sailors who are for the time being in Manchester, which takes the place of a temporary institution which has been in use for eight years, was opened by Lord Inverclyde on Wednesday in Trafford Road, Salford. The new building, which is exactly opposite the principal entrance to the docks, includes a large hall on the ground floor, with a commodious chapel above it, and there are in addition an officers' room, a classroom, mission-room, library and kitchen. The building was designed by Mr. Medland Taylor and is lighted by electricity. It was estimated to cost about 5,000*l.*

**The Bishop of Chester** (Dr. Jayne) visited Calday Grange grammar school, West Kirby, on the 24th inst., and formally opened the extensions which have been recently carried out at a total cost of 3,000*l.* The additions comprise a fine classroom, 66 feet by 24 (convertible into three rooms), and certain enlargements of the old rooms.

**At a Meeting** of the Stoke-on-Trent Board of Guardians on Wednesday a letter was read from the Local Government Board approving of the plans relating to the proposed reconstruction of the workhouse at a cost not exceeding 32,600*l.* The chairman proposed that application be made to the Local Government Board for sanction to borrow the amount required.

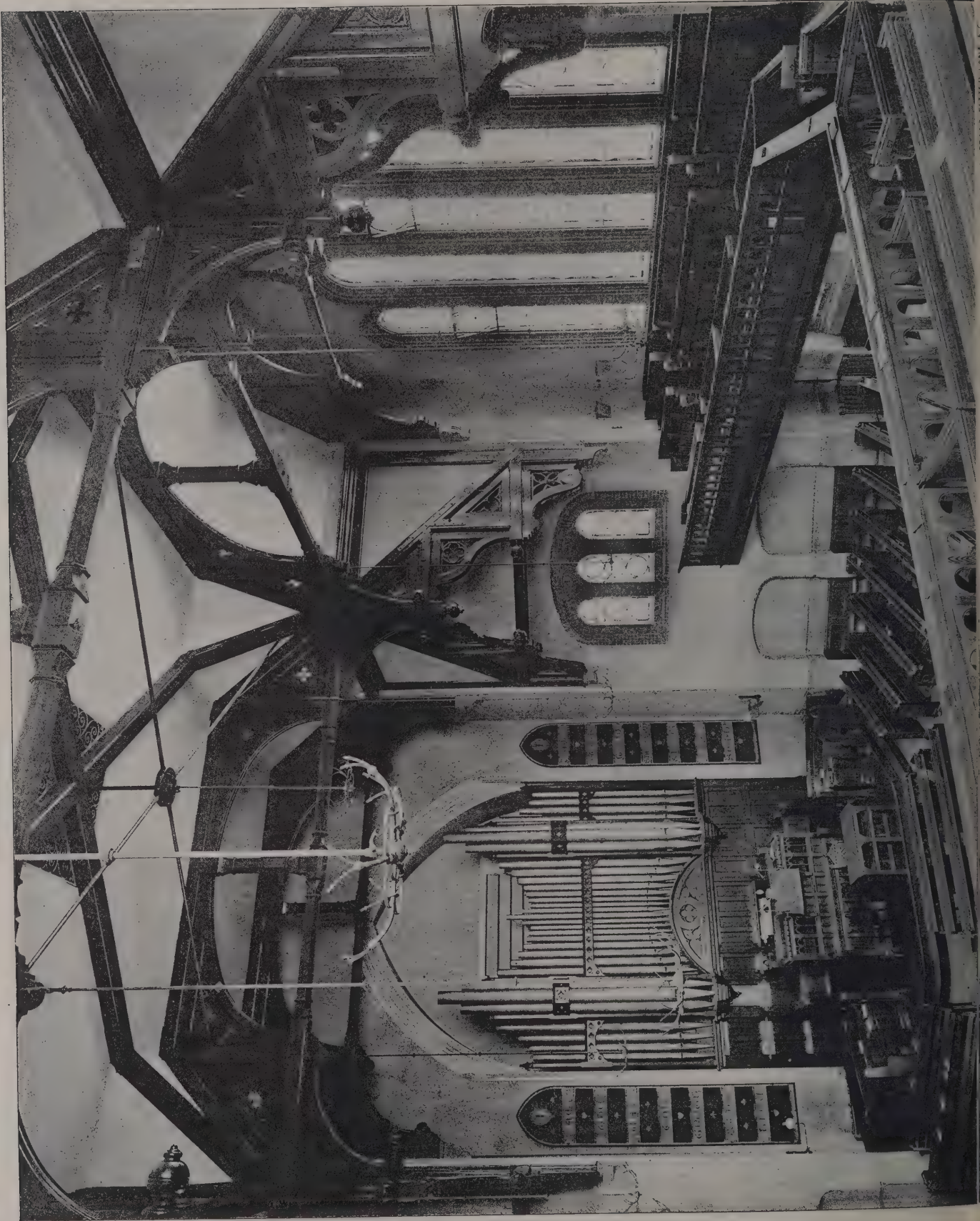
**The Borough Engineer** of Southend-on-Sea has submitted to the highways and works committee of the Corporation a scheme for widening the Marine Parade and the construction of a marine lake and pleasure grounds. If the works proposed by Mr. Alfred Fidler, the borough engineer, are carried out, the Parade would vary from 70 feet to 140 feet in width, and stretch from the Southchurch Beach Road on the east to Champ's Restaurant on the west, a length of one mile. The scheme includes the reclamation of a portion of the foreshore, on which would be constructed the marine lake and an open-air bathing-place. There would also be gardens, greens, shrubberies, band stands, shelters, &c. Sites would likewise be available for the erection of baths and other buildings, an Eiffel tower and big wheel. The finished level of the reclaimed area would be a little above the present level of the foreshore. Mr. Fidler estimates that the whole of the works would cost 340,000*l.*, against which there would be a revenue of 20,000*l.*, leaving an annual profit, after repayment of loan and sundry charges, of 5,000*l.*



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The Architect, Sep<sup>r</sup> 26<sup>th</sup> 1902.





*The Architect*, Sep<sup>r</sup> 26<sup>th</sup> 1902.



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THE VESTIBULE: LLOYD'S BUILDING  
T. E. COLLETT, F.R.S.





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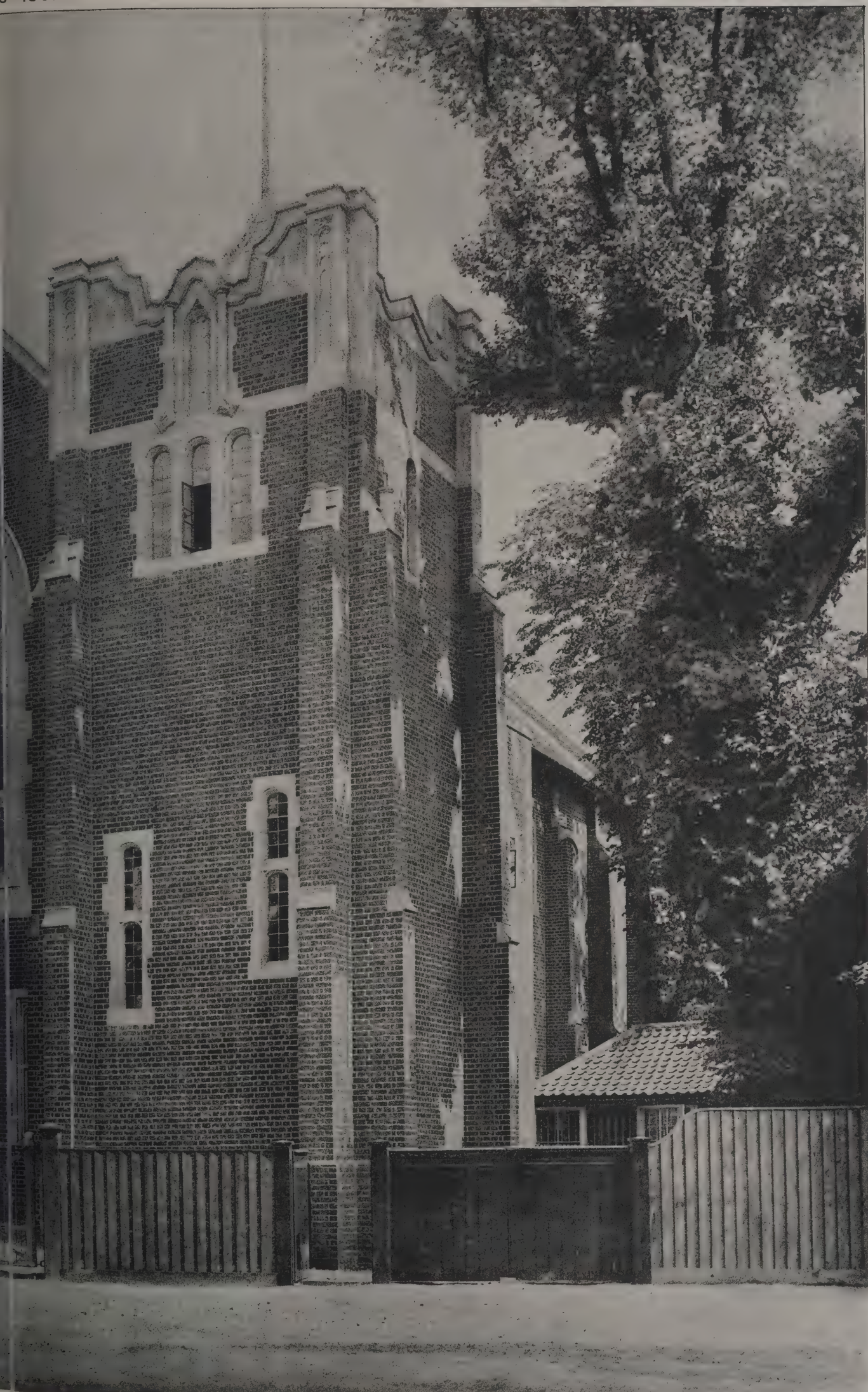












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THE  
**Architect and Contract Reporter.**

**EDITORIAL NOTICES.**

*In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

**TENDERS, ETC.**

*\*\*\* As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

**COMPETITIONS OPEN.**

**CAPE TOWN.**—Jan. 31.—The Council of the University of the Cape of Good Hope invite designs for the erection of university buildings. Premiums of 400*l.*, 200*l.* and 100*l.* will be awarded to the authors of the designs placed first, second and third respectively. Particulars of the competition may be obtained on application to the Registrar at Cape Town, or to the Agent-General in London.

**GREENWICH.**—Oct. 9.—Designs are invited for a public library (with chambers for chief librarian's residence) to be erected at a cost of about 6,500*l.*, with fittings, on a site about 7,000 feet super, in the borough of Greenwich. Premiums of 50*l.* and 30*l.* are offered. Particulars can be obtained on application to the Greenwich Borough Council.

**INDIA.**—Nov. 1.—Competitive designs are invited for the erection of a memorial to Her Majesty the late Queen Victoria at Allahabad. A premium of 2,000 rupees will be awarded to the design selected by the committee. Mr. H. Nelson Wright, Indian Civil Service, honorary secretary, Queen Victoria Memorial Fund Committee, Allahabad, India.

**MAIDENHEAD.**—Oct. 1.—Designs for free library. Premiums offered of £50, £20 and £10 respectively. Mr. John Kirk, town clerk, Guildhall, Maidenhead.

**NEWARK.**—Oct. 14.—Designs and suggestions are invited for alterations and additions at the infirmary, Bowbridge Road, Newark, comprising a board and committee-room, a new mortuary and provision for twenty extra beds. A prize of twenty guineas is offered for the best plans sent to the office of Mr. M. H. Colton, clerk, 27 Lombard Street, Newark.

**STROOD.**—Oct. 15.—Plans are invited for further hospital accommodation on a site recently acquired by the Strood Rural District Council in Whitehill Road, Cobham. A premium of 15*l.* 15*s.* is offered for the best set of plans submitted.

**CONTRACTS OPEN.**

**ALNWICK.**—Oct. 2.—For sanitary improvements at the workhouse. Particulars can be seen at the workhouse.

**AYLESBURY.**—Oct. 8.—For installation and maintenance of electricity for a term of years. Mr. Percy A. Wright, clerk, Town Hall, Aylesbury.

**BAGNALL.**—For erection of branch stores and four cottages at Bagnall. Mr. William V. Betts, architect, Bank Offices, Old Basford.

**BARNSELY.**—Sept. 30.—For erection of four dwelling-houses, shop and outbuildings in Tinker Lane, Hoyland Common. Messrs. Wade & Turner, architects, 10 Pitt Street, Barnsley.

**BARTON-UPON-IRWELL.**—Oct. 1.—For erection of the Godfrey Ermen memorial schools, Barton-upon-Irwell, Lancs. Messrs. Austin & Paley, architects, Castle Park, Lancaster.

**BOURNE END.**—Oct. 1.—For sinking a well near the railway station on the Great Western Railway. Mr. W. Vaux Graham, 5 Queen Anne's Gate, Westminster.

**BRANDON.**—Oct. 6.—For erection of a post-office at Brandon, Suffolk. Mr. James Farley, architect, Old Cross, Hertford.

**CHELMSFORD.**—Oct. 2.—For erection of county offices in Tindal Square, Chelmsford. Mr. Frank Whitmore, architect, Duke Street, Chelmsford.

**CHICHESTER.**—Sept. 29.—Contract No. 1, for construction of precipitation tanks, filters, boiler-house, pump-house, pneumatic ram pit, stable, cart shed and various other works in connection therewith. Contract No. 2, for construction, erection and setting to work of pneumatic forcing ram, sludge press and other machinery and appliances incidental thereto. Mr. J. W. Leader Cooper, town clerk, Town Hall, Chichester.

**CHICKENLEY.**—For erection of farm buildings at Chickenley, Yorks. Mr. Frederick W. Ridgway, architect, Borough Chambers, Dewsbury.

**CORNWALL.**—Oct. 6.—For alterations and additions to the Tinner's Arms, Zennor. Mr. N. C. Whear, jun., architect, Penzance.

**COVENTRY.**—Sept. 29.—For erection of a residence, St. Nicholas Street, Coventry. Messrs. Geo. & Isaac Steane, architects, 22 Little Park Street, Coventry.

**DERBY.**—Sept. 29.—For erection of a school on the Normanton Road. Mr. A. Macpherson, architect, Tenant Street, Derby.

**DERBY.**—Oct. 4.—For erection of (1) an isolation hospital to accommodate sixteen patients on land in Holmley Lane, Dronfield; (2) an isolation hospital to accommodate sixteen patients at Mastin Moor, Staveley; (3) an isolation hospital to accommodate sixteen patients in the parish of Morton, about one mile from Doe Hill station, Midland Railway. Mr. G. E. Bolshaw, architect, 189 Lord Street, Southport.

**DUDLEY.**—Oct. 11.—For erection of a new upper standard school, with caretaker's house, playgrounds, boundaries, &c., for the Dudley School Board. Messrs. Barrowcliff & Allcock, architects, Mill Street, Loughborough.

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**ECCLES**.—Oct. 8.—For erection of a public mortuary proposed at the town's yard, Patricroft. Mr. Wm. Henry Hickson, town clerk, Town Hall, Eccles.

**FAVERSHAM**.—Sept. 30.—For erection of a proposed parish hall and other works in connection therewith at Faversham. Mr. W. J. Jennings, architect, Canterbury.

**GLASGOW**.—Oct. 8.—For alterations and additions at Dalhousie dépôt. Mr. John Young, general manager, 88 Renfield Street, Glasgow.

**GREENWICH**.—Oct. 14.—For erection of a weights and measures testing office, with stable building and a coroner's court in Lamb Lane. Particulars may be obtained at the General Section of the Architect's Department, 18 Pall Mall East, S.W.

**HALIFAX**.—Sept. 29.—For erection of shops in Horton Street. Messrs. Geo. Buckley & Son, Tower Chambers, Halifax.

**HALIFAX**.—Oct. 1.—For additions to laundry and erection of mortuary at the Borough hospital, Stoney Royd. Mr. James Lord, borough engineer, Town Hall, Halifax.

**HALIFAX**.—Oct. 4.—For erection of two semi-detached villa residences, Skircoat Green Road, Halifax. Messrs. Geo. Buckley & Son, architects, Tower Chambers, Halifax.

**HARROW**.—Oct. 14.—For erection of a court-house at Harrow, Middlesex. Mr. H. T. Wakelam, county architect, Middlesex Guildhall, Westminster.

**HATFIELD**.—Oct. 8.—For erection of offices and buildings for the county surveyor's department at Hatfield. Particulars may be obtained at the Herts County Surveyor's Office, 41 Parliament Street, S.W.

**HOLBECK**.—For erection of sixteen houses at Holbeck. Mr. Fred. W. Rhodes, architect, Upper Wortley, Leeds.

**HOOLE**.—Oct. 4.—For erection of walling and fencing around the proposed recreation-ground, situate between Canadian Avenue and Bater Avenue, Hoole, Chester. Mr. Arthur D. Caldecutt, clerk, U.D.C., 17 Newgate Street, Chester.

**HUDDERSFIELD**.—For supply of high and low-tension cable to specification. The Borough Electrical Engineer, St. Andrew's Road.

**ILFORD**.—Oct. 6.—For supply and erection of contract No. 1: Dry-back semi-marine type boiler (15,000 lbs. evaporation per hour), superheater and accessories, and motor feed-

pump; contract No. 2: steam, feed and blow-off pipes, and feed filter; contract No. 3: surface condenser, cooling tower, motor pumps, hot well, grease extractor, exhaust steam and water pipes. Mr. J. W. Benton, clerk, Council Offices.

**IRELAND**.—Sept. 29.—For supply of 50,000 best machine-made solid, compressed brick, delivered at the Belfast cemetery. Mr. Samuel Black, town clerk, Town Hall, Belfast.

**IRELAND**.—Oct. 1.—For erection of fourteen labourers' cottages (including out offices, piers and gates), and the fencing of the acre plots attached thereto; also for fencing twelve plots at Kinsale. Mr. R. Evans, engineer, 53 South Mall, Cork.

**IRELAND**.—Oct. 2.—For executing a scheme of water supply at Kinsale. Mr. R. Evans, engineer, 53 Southall Mall, Cork.

**IRELAND**.—Oct. 11.—For erection of a residence for the chief medical officer at the Castlebar District Lunatic Asylum. Mr. Joseph T. Kelly, clerk of asylum.

**LEICESTER**.—Sept. 30.—For erection of an octagonal brick chimney-shaft 180 feet high at the new generating station, the Lero. Mr. E. George Mawbey, engineer, Town Hall, Leicester.

**LIGHTCLIFFE**.—Oct. 11.—For erection of four houses near the Old Church, Lightcliffe, Yorks. Messrs. Joseph F. Walsh & Graham Nicholas, architects, Museum Chambers, Halifax.

**LISCARD**.—Oct. 11.—For erection of sand-drying kiln, stables, stores, &c., on land in Seaview Road, Liscard, Cheshire. Mr. H. W. Cook, clerk, Public Offices, Egremont.

**LONDON**.—Oct. 7.—For erection of a new cartshed, bothy, &c., at Sydenham Wells Park, S.E. Particulars at the General Section (Architect's Department), L.C.C., 18 Pall Mall East, S.W.

**LONDON**.—Oct. 7.—For erection of a refuse destructor. Mr. D. J. Ebbetts, surveyor, 242 High Street, Acton, W.

**LONDON**.—Oct. 10.—For erection of baths at the artisans dwellings, Stoney Lane. Town Clerk, Public Health Department, Guildhall, E.C.

**LOWESTOFT**.—Oct. 7.—For construction of a timber pier at Lowestoft. Mr. John F. Stovell, secretary to the Coast Development Company, Ltd., 33 Walbrook, E.C.

**MIRFIELD**.—Oct. 1.—For erection of a council-room and alterations. Mr. F. H. Hare, architect, Town Hall, Mirfield, Yorks.

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NEWLYN.—Oct. 3.—For erection of new stores in the Coombe, Newlyn, Cornwall. Mr. Henry Maddern, architect, 26 Clarence Street, Penzance.

PETERBOROUGH.—Sept. 30.—For construction and seating of a Lancashire boiler, 28 feet by 7 feet, for the electricity works. Mr. John C. Gill, Corporation engineer, Municipal Offices, Peterborough.

RICHMOND.—Oct. 2.—For erection of a dining-hall and laundry buildings at the workhouse, Richmond. Mr. Edward J. Partridge, architect, Bank Chambers, Richmond, Surrey.

ST. ALBANS.—Oct. 11.—For erection of an infants' school at the Camp, St. Albans. Mr. F. W. Kinneir Tarte, architect, St. Albans.

SCOTLAND.—Oct. 9.—For erection of new gasworks, Ardrossan. Mr. James Cook, town clerk, Burgh Chambers, Ardrossan, N.B.

SENNEN.—Oct. 4.—For erection of a wain house and for alterations and new fittings to stable at Treveor, in the parish of Sennen, Cornwall. Mr. George Gow, Tregothnan Office, Truro.

SHEFFIELD.—Sept. 30.—For supply of 500 poles and 400 bracket arms for overhead line construction for the Sheffield Corporation tramway committee. Mr. A. L. C. Fell, general manager, Town Hall.

SIDMOUTH.—Oct. 2.—For erection of an hotel at Sidmouth, Devon. Mr. R. W. Sampson, architect, Manor Offices, Sidmouth.

SPAIN.—Oct. 12.—Huescar Municipality invites tenders for grant of a concession to light the town by electricity for a term of twenty-five years. Conditions of tender from the authorities.

SPAIN.—Oct. 12.—For works necessary to the installation of a town's water supply. Particulars may be obtained at the Casa Consistorial, Fonzeleche, Spain.

STAMFORD.—Oct. 27.—For erection of an infants' room at Greatford school, and removing and rebuilding the existing outer offices. Specifications and plans to be seen at the school or sent on application.

STARBECK.—Oct. 7.—For construction of a passenger sub-way under the railway at Starbeck station, Yorks, for the North-Eastern Railway Co. Mr. C. N. Wilkinson, secretary, York.

SWADLINCOTE.—Sept. 30.—For erection of workmen's cottages in Darklands Road, Swadlincote. Mr. Thomas Kidd, surveyor, Swadlincote.

SWINDON.—Oct. 4.—For supply, delivery and erection of all the materials, fittings and accessories for a complete electric-light installation at the electricity works, and for the supply of testing instruments and engine-room accessories, &c. Messrs. Lacey, Clirehugh & Sillar, engineers, 2 Queen Anne's Gate, Westminster.

WALES.—For erection of a dwelling-house at Park Cottage, Prendergast parish, Haverfordwest. Mr. John Thomas, 15 Upper Laws Street, Pembroke Dock.

WALES.—Sept. 29.—For erection of two classrooms and a new lobby for infants' department, the alteration of two classrooms, the erection of four new out-offices, &c., at the Board schools, Cwmcam, Mon. Mr. R. L. Roberts, architect, Abercarn.

WALES.—Sept. 30.—For erection of fifty dwelling-houses at New Tredegar, Mon. Mr. Geo. Kenshole, architect, Station Road, Bargoed.

WALES.—Sept. 30.—For private street works in West Street, Abercynon, Mountain Ash. Mr. John Williams, surveyor, Town Hall, Mountain Ash.

WALES.—Oct. 1.—For alterations to the Bethlehem chapel, Blaenavon, Mon. Mr. F. Bennett, 1 Lower Waun Street, Blaenavon.

WALES.—Oct. 2.—For construction of a cattle and sheep mart at Llantwit Major. Mr. Miles, solicitor, Cowbridge.

WALES.—Oct. 6.—For erection of a schoolroom at Dynevor. Messrs. Martyn & Lloyd, architects, Dynevor Post Office, Neath.

WALES.—Oct. 6.—For erection of a Congregational church and school at Pontypool. Messrs. Swash & Bain, architects, Midland Bank Chambers, Newport, Mon.

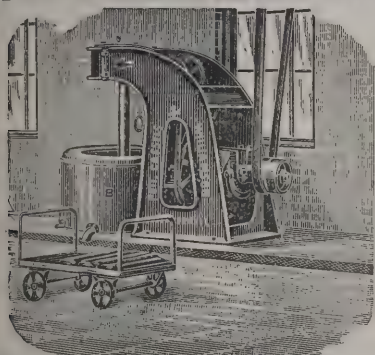
WALES.—Oct. 6.—For erection of latrines, &c., at the Troedrhigwair school. Messrs. James & Morgan, architects, Cardiff.

WALES.—Oct. 16.—For erection of a police station and cells at Llanfairfechan. Mr. J. H. Bodvel Roberts, 10 Castle Street, Carnarvon.

WESHAM.—Sept. 30.—For erection of workhouse and offices at Wesham, Lancs. Messrs. Haywood & Harrison, architects, Accrington.

WESTON-SUPER-MARE.—Oct. 4.—For alterations to the shops beneath the Assembly Rooms, High Street. Messrs. S. J. Wilde & Fry, architects, Boulevard Chambers.

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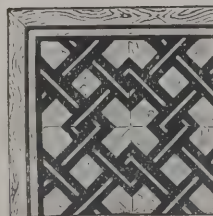
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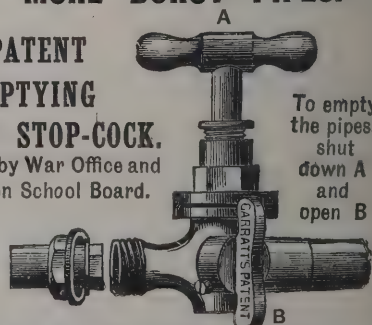
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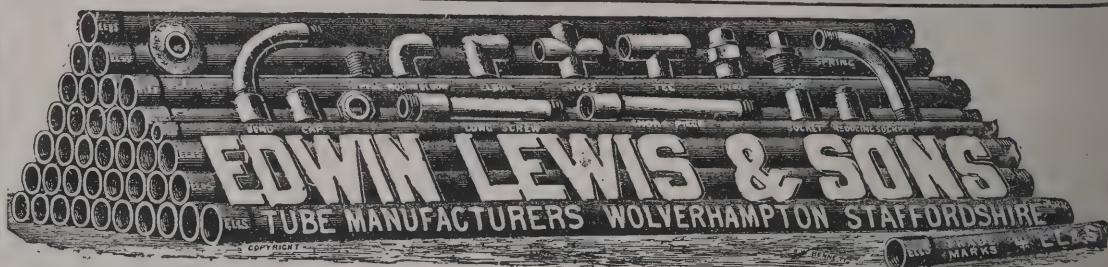
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Martin & Goodchild . . . . .	234	10	0
H. C. Williard . . . . .	219	0	0
W. WEBBER, London (accepted) . . . . .	198	10	0

ORPINGTON.

For decorations to Village Hall, Orpington, for Mr. A. Brown. Mr. G. ST. PIERRE HARRIS, architect, 8 and 9 Ironmonger Lane, E.C.

W. R. TAYLOR (accepted) . . . . .	£160	0	0
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PENGE.

For adapting 129 Anerley Road for use as offices, for the Penge Urban District Council.

Hampton & Son . . . . .	£159	18	2
F. Lumley . . . . .	146	10	0
H. Ockenden . . . . .	142	0	0
H. LENEY & SON, Penge (accepted) . . . . .	140	0	0

PLYMOUTH.

For erection of a dry wall at Knighton and laying pipes at Wembury Ford.

W. E. BENNETT, Plymouth (accepted) . . . . .	£58	0	0
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RIPON.

For erection of the Victoria Nurses' Home at Ripon. Mr. THOMAS STOKES, architect, Thirsk.

Accepted tenders.

Mitchell & Webster, Hecklar Houses, bricklayer and stonemason.

J. H. Knowles, Waterskellgate, plasterer.

J. W. Ruecroft, Sowerby, Thirsk, carpenter and joiner.

T. Harrison, North Street, plumber and glazier.

Baynes & Beck, North Street, slater.

A. J. G. Almond, Skellgarths, painter.

R. Falshaw, Albert Street, Harrogate, electric light and electric bells.

Total, £1,317.

ST. PAUL'S CRAY.

For erection of four cottages, St. Paul's Cray, Kent. Mr. G. ST PIERRE HARRIS, architect 8 and 9 Ironmonger Lane, E.C.

F. Wood . . . . .	£1,558	16	0
Somerford & Son . . . . .	1,420	0	0
F. KNIGHT (accepted) . . . . .	1,349	0	0
C. Dabner . . . . .	1,136	0	0

SOUTHGATE.

For street works in Stanley, Highworth and Union Roads and Jones's Lane, Bounds Green. Mr. C. G. LAWSON, surveyor.

Stanley, Highworth and Union Roads.

Griffiths & Co., Ltd. . . . .	£3,579	10	0
J. A. Dunmore . . . . .	3,317	0	0
C. Ford . . . . .	3,156	0	0
T. ADAMS, Wood Green, N. (accepted) . . . . .	2,998	0	0

Jones's Lane.

Griffiths & Co., Ltd. . . . .	2,675	15	3
C. Ford . . . . .	2,593	0	0
T. Adams . . . . .	2,382	0	0
J. A. DUNMORE, Highgate (accepted) . . . . .	2,234	0	0

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## SCOTLAND.

For erection of a dwelling-house on the farm of Mackie's Steps, Easter Carnie, Skene, Aberdeen. Mr. JOHN RUST, city architect.

*Accepted tenders.*

A. Wilson, Culter, carpenter	£60	0	0
A. Anderson, Skene, mason	50	2	6
J. & R. Seivwright, West High Street, Inverurie, plasterer	23	12	0
R. Shaw, Culter, slater	21	5	0
J. Campbell, Dee Street, Aberdeen, plumber	4	5	0

## WALES.

For erection of twenty cottages (at per cottage) at Pontllanfraith.

D. Powell	£189	0	0
E. Williams	183	0	0
T. Jenkins	181	15	0
H. REES, Penllwyn Back Blackwood, Mon. ( <i>accepted</i> )	174	0	0
J. Williams & Co.	168	15	0

For erection of two houses at Caldicot, Mon. Mr. E. BLEWITT, architect, Blaenavon.

J. Hatherly	£1,087	0	0
Leadbeter Bros	659	0	0
W. T. Sier	550	0	0
C. SHOPLAND, Newport ( <i>accepted</i> )	460	0	0

For installation of heating apparatus at the Calvinistic Methodist chapel, Clydach, Swansea Valley.

MUSGRAVE & Co., LTD., Belfast (*accepted*).

## WOOLWICH.

For erection of a greenhouse on the new portion of Woolwich cemetery.

Hitchinson	£270	0	0
Smith & Watkins	230	10	0
Harbrow	210	0	0
Sutch	210	0	0
E. Jones	208	10	0
Watts	200	0	0
W. Baine	195	0	0
Adams & Bird	194	15	0
J. Stevens	168	0	0

## WOOLWICH—continued.

For erection of municipal buildings.

*With town hall.*

M. Wells & Co.	£68,777	0	0
Johnson & Son	68,674	0	0
W. Downs	68,074	0	0
Holloway Bros.	67,996	0	0
B. E. Nightingale	67,662	0	0
J. Smith & Son	67,184	0	0
H. L. Holloway	66,456	0	0
H. Lovatt	64,362	0	0
Kirk & Randall	62,611	0	0
Holliday & Greenwood	62,292	0	0
J. Shillitoe	62,000	0	0
F. G. Minter	61,890	0	0
H. J. Stevens	60,606	0	0
J. Chessum	56,771	0	0

*Without town hall.*

M. Wells & Co.	58,266	0	0
Holloway Bros.	58,111	0	0
W. Downs	57,985	0	0
B. E. Nightingale	57,415	0	0
J. Smith & Son	56,987	0	0
H. L. Holloway	56,069	0	0
H. Lovatt	54,398	0	0
J. Shillitoe	53,000	0	0
Holliday & Greenwood	52,814	0	0
Kirk & Randall	52,805	0	0
F. G. Minter	52,600	0	0
H. J. Stevens	51,027	0	0
Johnson & Son	50,959	0	0
J. Chessum	49,125	0	0

*Received too late for Classification.*

## HASTINGS.

For sewerage works in White Rock Road, Hastings. Mr. P. H.

PALMER, borough engineer.

W. SMITH, The Elms, Blacklands, Hollington, Hastings (*accepted*). £264 0 0

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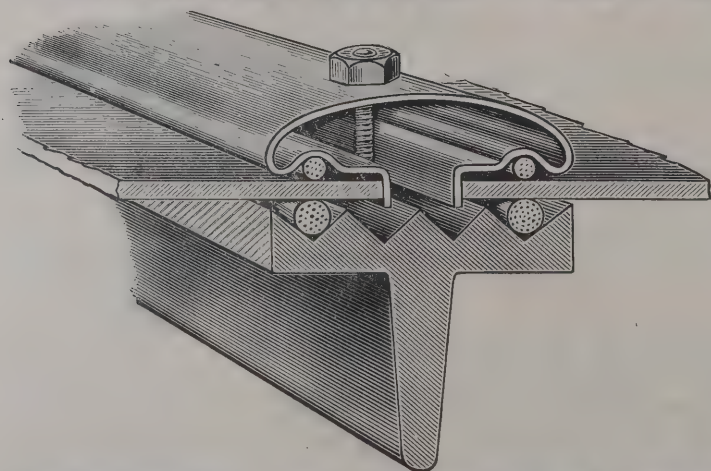
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**BEXLEY HEATH.**

For erection of four cottages on the Foresters' Asylum estate,  
May Place Road, Bexley Heath, Kent. Mr. W. F.  
POTTER, architect.

John Shelley . . . . .	£1,950	0	0
Robson & Moon . . . . .	1,935	6	0
W. F. Blay . . . . .	1,816	0	0
John Lonsdale . . . . .	1,714	0	0
W. Coates . . . . .	1,642	0	0
Coulsell Brothers . . . . .	1,600	0	0
Crabb & Son . . . . .	1,540	0	0
H. J. Atkin . . . . .	1,457	12	6
W. F. Small . . . . .	1,275	0	0
Arnold & Co. . . . .	1,269	0	0
G. A. Bown . . . . .	1,220	0	0
J. Dawson . . . . .	1,200	0	0
Enness Brothers . . . . .	1,178	0	0
POULTON & SONS, Thornton Heath (accepted)	1,120	0	0
W. Mayhew . . . . .	1,095	0	0

**EPSOM.**

For alterations and fitting-up shop for the International Tea  
Company, Ltd, High Street, Epsom. Messrs. WILLIAM  
EVE & SONS, architects, 10 Union Court, Old Broad  
Street, E.C.

Jones & Son . . . . .	£1,930	0	0
Soole & Son . . . . .	1,870	0	0
Lascelles & Co. . . . .	1,865	0	0
Watts, Johnson & Co. . . . .	1,820	0	0
Edgoose . . . . .	1,818	0	0
Barker . . . . .	1,775	0	0
F. & H. F. Higgs . . . . .	1,740	0	0
Roll & Taylor . . . . .	1,695	0	0
Saunders . . . . .	1,560	0	0

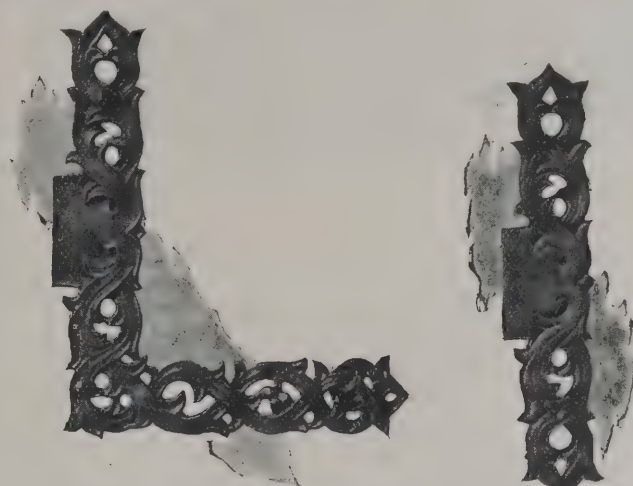
**LONDON.**

For repairs and sanitary work to be done at the Licensed  
Victuallers' Asylum, Asylum Road, Old Kent Road, S.E.  
Mr. W. F. POTTER, architect.

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C. King & Son . . . . .	£435 0 0	£80
H. Cooke . . . . .	295 10 0	105
J. J. Bridger . . . . .	—	75
F. DAWES, Peckham Rye (accepted)	210 0 0	52
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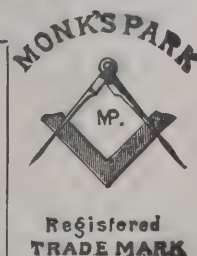
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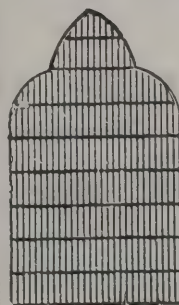
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pleasure of inspecting, and unfortunately the illustrations which we are able to give fail to convey an adequate impression of the delicacy of some of the workmanship, but they show



a certain boldness and originality of treatment which is pleasing. This is especially noticeable in the illustration below,



of a kicking-plate which forms part of the furniture of a yacht cabin door, or that of a yachting club. These goods, which are in all cases stamped with the trade mark on the back as here given, are made in various metals and finishes—gold, silver, bronze, brass, copper, gunmetal or steel, and are distinguished by accuracy of fit and mechanism.



TRADE MARK.

The Yale locks are too well known to need any description. We may, however, say that The Yale and Towne Manufacturing Company can supply them for every imaginable purpose. They have also a variety of spring hinges, among which we may mention the Blount combined door spring and check. In

this the checking medium consists of a liquid (instead of air) which, being non-elastic, gives a smooth, steady and uniform motion to the door. The working parts consist of a metallic piston, without packing, moving in a metallic cylinder containing a non-freezing liquid. The movement of the door depends upon the escape or passage of this liquid from one end of the cylinder to the other, an important feature being that the working parts are thus always immersed in a lubricating fluid, and the piston requires no packing. We can recommend those of our readers who are interested in goods of this description to inspect the samples on view in Chapel Street.

#### TRADE NOTE.

MESSRS. JOHN WRIGHT & CO. (John Wright and Eagle Range Company, Ltd.), of Essex Works, Thimble Mill Lane, Birmingham, have just got out a new price list of their "Eureka" gas fires, which are depicted in various attractive forms, and at prices ranging from a few shillings to as many pounds.

#### ELECTRIC NOTES.

DURING the month of August 30,531 units of electricity were generated in Greenock and 25,613 were sold, being 12,938 more than for the same period last year. For traction 66,359 units were supplied. The applications for supply now number 287, which are equivalent to 38,289 eight candle-power lamps.

THE Colwyn Bay Town Council have decided to practically double the resources of the electric-lighting station, and the preliminary steps are being taken with the great improvement scheme sanctioned by Parliament this year. When the scheme is completed it will provide a promenade three miles long and a magnificent marine drive.

THE plans for the Manchester and Liverpool Electric Express Railway are, it is said, now quite ready, and an official announcement may be expected at no distant date. In the meantime the engineers are very busy on plans for the new London to Brighton and Dover mono-railway, and there is little doubt that a Bill will be proceeded with during the next session of Parliament.

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KING'S COLLEGE SCHOOL, WIMBLEDON COMMON, S.W.

ST. DAVID'S CHURCH, BATHGATE.

CONGREGATIONAL CHURCH, FINCHLEY ROAD.

MAJOR STEWART, an inspector appointed by the Local Government Board, held an inquiry at Ashton-under-Lyne on the 18th inst. into an application by the Town Council for permission to borrow 30,000*l.* for the purposes of extensions to the Wellington Road Electricity Works, and other improvements in regard to the supply of electrical energy in the borough. The town clerk (Mr. Bromley) explained that the electricity committee contemplated a considerable extension of buildings and the installation of new machinery to meet the increase in demand for the current and the laying of additional mains. A sum of 19,382*l.* was to be spent in the first department, this sum also including the cost of two sets of generating plant and surface condenser. Evidence was given by the electrical engineer, Mr. Applebee, and Colonel Eaton, architect. A sum of 34,200*l.* has already been spent on the works.

THE electric-lighting committee of Edinburgh Town Council had again before it at a meeting the negotiations with the Caledonian Railway Company for the supply of electric energy for lighting and motive power for Princes Street station and hotel and for the adjoining goods yard. The parties have practically come to terms, and it was left to the town clerk to complete the bargain. The contract will be a beneficial one to the municipal undertaking, as the annual consumption will be about half a million units. Hitherto the Caledonian Railway Company have had a private installation, but that will now be abandoned. From July 18 to September 11 the applications for electric current from Edinburgh Corporation amounted to the equivalent of 13,777 eight candle-power lamps, of which 8,828 were for lighting, 4,035 for motors and 914 for heating. In the corresponding period of last year the total was 13,687 eight candle-power lamps.

## BUILDING AND BUILDERS.

WIGTON parish church (Westmoreland) is to be restored at a cost of 200*l.*

THE Barnsley School Board is about to apply for powers to borrow 1,350*l.* for erecting a temporary iron school, for use until the new school is completed, and for street-making.

AT Bolton foundation-stones of new schools were recently laid, one in the Victory district (Board school), the other a Wesleyan day school in connection with Victoria chapel.

THE foundation-stones of a new Primitive Methodist church which is being erected at Hall End, West Bromwich, have been laid.

THE foundation-stone was laid on the 17th inst. of St. Oswald's Church Institute, which is being erected in Church Street, Durham, from designs of Mr. Cowe. It is expected that the cost will amount to between 1,700*l.* and 1,800*l.*

THE magistrates of Aberdeen had a meeting last week with Mr. Matcham, architect, London, to discuss the plans of the proposed new theatre. The plans were approved. The building will cost upwards of 20,000*l.*

ON the 20th inst. the foundation-stone of a new Roman Catholic church was laid at Irlam, near Manchester. The new church is being erected at the corner of Astley Street and Liverpool Road, and will provide accommodation for 350.

THE village of Kempley, Gloucestershire, is to have a new church—it already has two—and the foundation-stone was laid by Countess Beauchamp on the 18th inst. It will be an attractive building, of Forest of Dean stone, capable of seating a congregation of 140, and will consist of nave and chancel, with a side chapel, vestry and porch.

THE Cheshire County Council is negotiating loans, amounting to some 90,000*l.*, to defray cost of various county works connected with lunatic asylums and police stations. A loan of 62,000*l.* is wanted for the cost of the new annexe at Parkside Asylum, and over 11,000*l.* is wanted for a new epileptic ward for the same institution.

THE foundation-stone of the Sir William Pearce Memorial Institute in Govan, the gift of Lady Pearce to the working classes of the burgh, was laid with Masonic honours on the 20th inst. by Sir William G. Pearce. Subsequently Lady Pearce laid the foundation-stone of the Macgregor United Free church, Govan, which is intended to commemorate the

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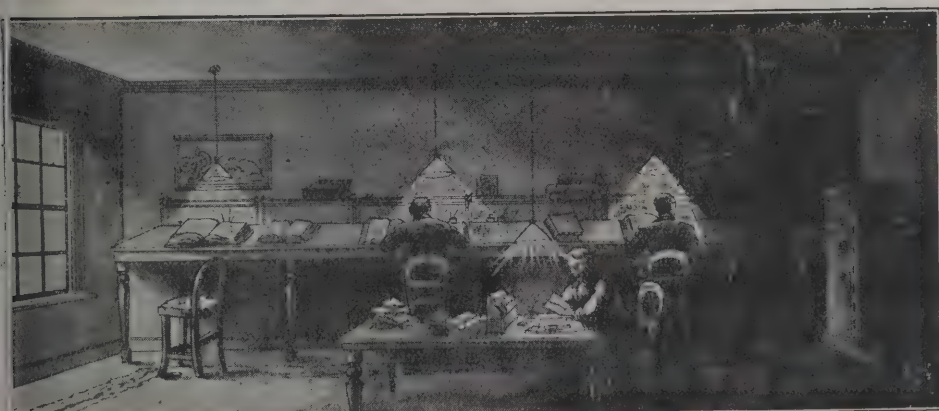
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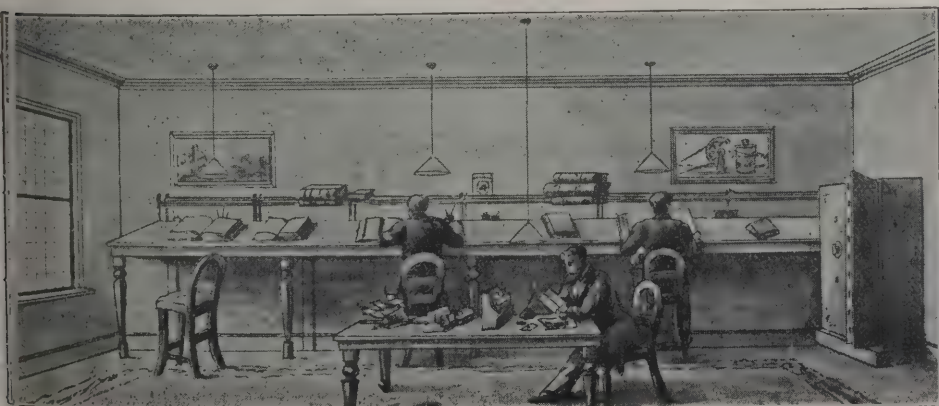
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The above illustrates an office where the light coming from the sky falls on to the floor and is absorbed, thus leaving the back part of the room dark. The illustration below shows the same room with WILSON'S PATENT MULTILUX WINDOW fixed. This refracts the rays of light and throws them horizontally, thus preventing them falling on to the floor, and lighting up the whole room.





evangelistic work carried on among the Fairfield workmen by Mrs. Cunningham Burns Macgregor.

### VARIETIES.

A NEW iron bridge above the two old stone structures at Devil's Bridge, Aberystwith, has been erected by the County Council and the approaches are improved. The extra height of the new bridge gives an additional charm to the view.

A NEW Board school was formally opened at Ramsbottom, Lancs, on Saturday afternoon. It is excellently situated at Peel Brow, in the east ward of the town. It has accommodation for 600 scholars.

THE death took place on the 17th inst. in Staffordshire, at the age of sixty, of Mr. Hamilton Rendel, who until two months ago was at the head of the engineering department of the Elswick works, a position from which he retired owing to ill-health.

CARDINAL VAUGHAN has approved the plans for the erection of a new church at Shepherd's Bush, and building operations will be begun at once. A good site has been procured in Ash Church Grove. The nave and one aisle will be built first, and opened for worship.

At a meeting of the Aberavon Ratepayers' Association, it was decided that Messrs. W. H. Carney (Port Talbot Graving Dock Company) and T. B. Smith, architect, be asked to contest the Aberavon municipal election in the interests of the Association. Both gentlemen have consented.

THE formal opening of the new public baths at Atherton, Lancs, which have been erected by Messrs. S. & J. Whitehead, contractors, Oldham and Blackpool, at a cost of about 5,000*l.*, took place on Saturday afternoon. The internal arrangements of the baths are on modern lines. There are slipper, vapour and shower-baths for both sexes, and the swimming-bath is 75 feet long and 30 feet wide.

PREPARATIONS for the erection of the Queen Victoria memorial statue which is to be placed in Warrior Square, Hastings, are now well in progress. The statue is of bronze, and will be placed on a pedestal of massive red granite. Her late Majesty is represented as standing facing the sea, with the sceptre and orb in her hands. The total height of the memorial will be 17 feet.

WARRINGTON parish church has been recently undergoing considerable alterations and the Boteler chapel has now been reopened. The organ has been entirely reconstructed and removed from the west end to an arch between the Boteler chapel and the tower. The plaster has been removed from all the walls of the church and the stonework exposed. The seating accommodation in the Boteler chapel has been rearranged and an altar erected.

OUT of about fifty applicants, the following twelve gentlemen have been selected to form a short list of competitors for the post of town clerk of Gourock:—Charles P. McNeill (Greenock), Robert Reid (Alloa), John J. Colquhoun (Whithorn), James Marquis (Greenock), Colin C. MacCulloch (Greenock), William Nimmo (Greenock), A. Douglas Murray (Greenock), John D. F. Yuill (Glasgow), G. P. Anderson (Glasgow), William Hamilton (Edinburgh), George Dunlop (Gourock), and Duncan Kerr (Greenock). The salary is 150*l.*, with 20*l.* additional to go towards office rent.

THE Bishop of Liverpool, Dr. Chavasse, has laid the foundation-stone of a new church at West Derby, which will form a chapel-of-ease to the parish church. The new building is situated at the hamlet known as the Dog and Gun, about a mile and a half from West Derby village, at the junction of four cross roads—Carr Lane, Lowerhouse Lane and Derryhouse Lane. Designed by Mr. J. Oldrid Scott, son of Sir Gilbert Scott, the church will be of stone, in the Early English style, and will be of cruciform shape, with nave, apse, two transepts for the organ and vestries, and surmounted by a small central tower. The edifice is to accommodate some 300 worshippers.

THE Nurses' Home erected by the Guardians of the Stoke Union has been formally opened. This building, which is now ready for occupation, is erected on a site south of the general workhouse buildings, in a position which has the advantages of good prospect, good aspect and plenty of space. The home contains on the ground floor of the main or living block the various sitting-rooms, dining-room, writing-room, kitchen, stores, &c. The first and second floors are mainly occupied by bedrooms. The entrance and sanitary block is separated from the main block by a corridor on each floor. The whole is substantially built, the floors being fireproof and the staircase of concrete. The ventilation and general sanitation have been carefully looked to, the principal rooms being ventilated by electric power. The home is planned to accommodate twenty-four nurses. The cost is somewhat under 4,000*l.* Messrs.

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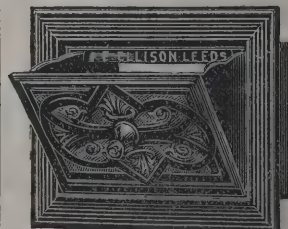
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Meiklejohn & Son, of Stoke-on-Trent, were the general contractors, and Messrs. Lynam, Beckett & Lynam, also of Stoke, were the architects.

A NEW gravitation water supply for the burgh of Galston, N.B., was opened last week at the reservoir on the farm of Passford, near Loudounhill. The magistrates and councillors of the burgh, with other friends, including the Town Council of the neighbouring burgh of Newmilns and Greenholm, drove up to Passford, where the ceremony of turning on the new water supply was performed by Mrs. White, wife of the Provost of Galston. Provost White gave a brief epitome of the origin and carrying out of the scheme. The reservoir, which is built of concrete, is 80 feet long, 40 feet wide and 12 feet deep, and has storage capacity for 200,000 gallons of water. Its height is about 424 feet above sea-level. The water is conveyed by 5-inch pipes to the lower end of Newmilns burgh, from which a previously existing 5-inch pipe conveys it to Galston. As the difference of level between the reservoir and the middle of the burgh at Galston is about 300 feet, the pressure is expected to be ample for all requirements. The work has been carried out by the firm of Messrs. W. R. Copland, water engineers, Glasgow. The estimates for the contract amounted to 5,500*l.*, but water claims and legal expenses will make the cost very much higher.

ACCORDING to the annual report just issued by His Majesty's consul at Rome, so many alterations and improvements have been effected in the city and its vicinity that visitors who have not been in Rome for the past twenty years can hardly recognise it. Suburbs have risen over the vineyards outside the city walls; old quarters have been superseded by large and commodious dwellings; the Tiber is permanently embedded all along its urban course between two gigantic embankments, on which fine houses overlooking the river have been constructed; solid granite bridges, meant to defy the ravages of time and the impetus of the once dangerous Tiber, have been thrown across the two embankments; new and wide thoroughfares have been opened; in a word, the city has been completely modernised and rendered in all respects quite sanitary, as shown by the returns of mortality. These facts, coupled with the traditional courtesy of its inhabitants, render Rome a most agreeable and healthy place of sojourn. Extensive excavations have lately been undertaken by the Government, especially in the area of the Roman Forum, and the results have amply justified the expenditure

and the labour involved in carrying out the plan of investigation proposed by the Archaeological Department.

THE masonry of Connel Bridge, which is built over Loch Etive, N.B., is well advanced, and the erection of the steelwork on both sides is now in progress. This structure forms a part of the Callander and Oban Railway extension from Connel Ferry to Ballachulish, and is certainly the greatest engineering feat ever attempted in the Highlands. The design adopted is that known as the cantilever, and when completed the clear span of 500 feet will be the second largest in Europe, coming next to that of the Forth Bridge. The navigation for small steamers and other craft to the upper reaches of the loch must, of course, be preserved, and the height of the bridge above ordinary high tide is to be 50 feet. Sir J. Wolfe Barry, K.C.B., Westminster, is the architect, and the entire superstructure will be of steel. In deference to representations made by the district committee of the Argyll County Council, an access for foot passengers will be provided across the bridge. This arrangement will involve the abolition of the awkward ferry at Connel. The Ballachulish line is twenty-six miles in length, and traverses a country which, owing to the irregularity of the coast-line and the numerous intervening arms of the sea, does not readily lend itself to railway extension. All obstacles are being, however, successfully overcome, and 75 per cent. of the permanent way has now been laid. Within twelve miles of Connel Ferry is the island of Seil, which was, although probably very few people are aware of the fact, the first island in Great Britain to be connected with the mainland by a bridge. The interesting specimen of Mediæval architecture, which consists of a single stone arch, is still absolutely flawless and substantial, and affords the only means of communication with the island.

#### THE SCIENCE OF THE WORKSHOP.

IN the Engineering Section of the meeting of the British Association a paper was read by Mr. W. J. Taylor on "The Science of the Workshop." After referring to the various materials used by engineers the author discussed the processes by which they were formed into machines or tools. As an example of a new departure he instanced the formation of a milling cutter between 3 and 4 inches in diameter, with deep teeth on its periphery and on both faces. This cutter had been formed cold from a blank of tool steel by hydraulic pressure. It was said to serve its purpose as well as any

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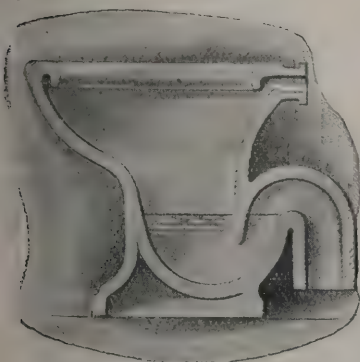
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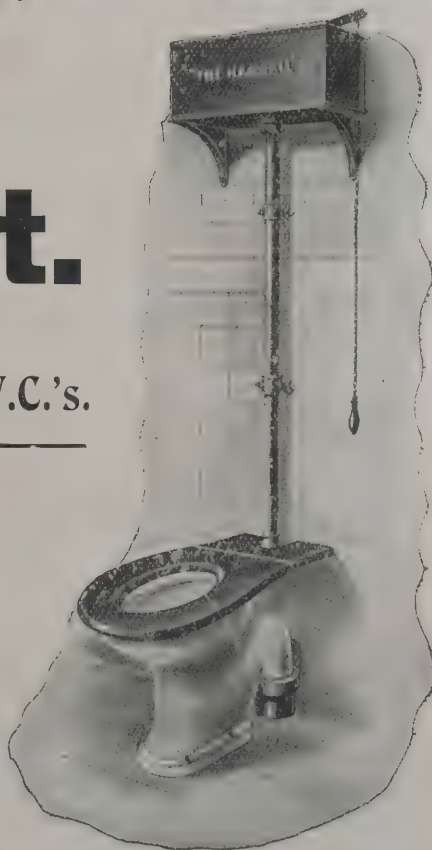
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cutter milled from a solid blank. In operations of this nature time was of considerable importance. Some remarkable work had been done, in connection with cycle-making and in other industries, in the drawing of sheet metals in the press. One of the limitations was the hardening of metal during treatment. In forging heavy masses of steel the element of time had been found to be of great importance. Small articles were produced satisfactorily in quick-acting drop presses; large masses demanded the slowly acting hydraulic press. In dealing with the problem of cutting action the author pointed out that cutting was largely composed of shearing. In turning mild steel, for example, the tool acted by compressing the material in front of it until rupture occurred by shearing in front of the chip. In an extremely plastic substance, or one which was both elastic and plastic, chips could be removed without shearing action because they would be sufficiently elastic or plastic to bend or flow without rupture and would permit the passage of the tool. In planing wood with the grain the chips would not be removed by intermittent shearing, but if ruptured at all would be ruptured by bending. Should rupture occur in advance of the cutting edge of the tool perfect cutting action would cease and rupture of the chip would not be an essential part of the cutting action. The author next dealt with the action of grinding machinery, pointing out that the removal of metal by abrasion at high velocities was probably largely due to the heating of particles removed.

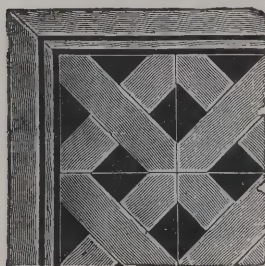
### NATIONAL ASSOCIATION OF MASTER HOUSE PAINTERS.

THE annual convention of the National Association of Master House Painters and Decorators was begun on Tuesday in Newcastle-on-Tyne, Mr. J. Graham Cole, of Newcastle, presiding. After a municipal welcome by the mayor (Alderman H. W. Newton), the president said that in his visits to the local associations he was glad to see a general awakening to the fact that, if they wished to be respected and to have their work appreciated by the public, they must not only educate themselves, so far as the trade was concerned, and keep themselves abreast of the times, but they must see that those who were following them and taking their places were also educated. He had been delighted to find technical schools doing splendid work in most of the cities and towns he had visited and work-

ing under efficient masters of their craft. Up to the present however, the technical schools had dealt only with apprentices and he suggested that the time had arrived when they should institute continuation classes for those who had passed their apprenticeship. He was glad to know that his views in this matter were shared by the presidents of the Scottish and Irish National Associations. He suggested that in each town and city employers should call meetings of the operatives and confer with them, and so get their co-operation if possible. He had been pleased to see that great amount of attention given to colour studies at the various schools and exhibitions. The interiors of our homes were often spoiled for want of this knowledge. Students should study colour as if they were studying music. The decorator, who was a master of colour, not only had it in his power to make the home beautiful, but was a power also for dispensing happiness in connection with the work in the schools. He advocated the establishing of a first-class training national technical school in some central position in the country, saying that the reports received from such schools in Germany convinced him that such an institution would be of the greatest value to the craft. The present technical schools were, after all, only of an elementary character. An exhibition of decorators' work was opened by Mr. J. D. Crace, of London, president of the Institute of British Decorators, who said the Association had never taken up any subject more valuable than that of promoting the education of those who were to succeed them. It was impossible to exaggerate the value of technical schools, but only, he held, as supplementary to an apprenticeship. He did not believe that any youth would ever learn a trade by a technical school alone. In technical schools everything was made comparatively easy, but in apprenticeship the boy was left to his own resources, face to face with work comprising all the irregularities and possibilities of failure.

### THE AMERICAN WESTINGHOUSE WORKS.

IT is sixteen years, says a correspondent of the *Glasgow Herald*, since George Westinghouse decided to "play electricity for all it was worth." The Westinghouse Electric Company at East Pittsburgh is the greatest plant in America. The Westinghouse works at Old Trafford, near Manchester, is the greatest plant in England. East Pittsburgh is to-day the mart for ideas in electrical work. And here is a point which shows the type



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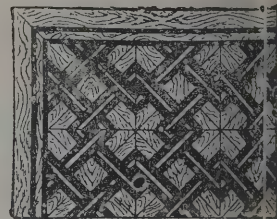
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man who directs these businesses. There are thousands of inventions, good in theory, which won't bear practical test. Most manufacturers being satisfied that an idea, however ingenious, is useless, would thank the inventor and say good-bye. Mr. Westinghouse, with the intuition of genius, often gets a patent that has been condemned. He has a body of men who do nothing but experiment. He takes an unworkable patent to a man. "The idea in this thing is all right, only it won't work in practice. I want you to put it right." And it is to be done.

We all know the name of Nikola Tesla, whom some in the scientific world regard as an electrical mountebank. Mr. Westinghouse cut through the flamboyant imaginativeness of Nikola Tesla and got down to the bed-rock of his theories. He saw that Nikola Tesla, behind all his firework talk, had brains. Patents of Nikola Tesla, regarded by many men as waste paper, Mr. Westinghouse bought. He handed over the gas to sound, level-headed electricians with the order, "Make them practicable." It was from the scoffed-at electrician that came the germ of the fundamental patents of the distinctive Westinghouse electrical apparatus in induction motors, and the use of alternating high-tension currents. At Niagara are several 100,000-volt transformers, turning the mighty falls into commercial value.

George Westinghouse, like all Americans, is always enthusiastic about something. He took up the Nernst electric lamp, which was nothing but a laboratory device, and made it practicable. He took to the making of steam-engines. He made the little steamer *Turbinia* that slices through the sea at forty-eight miles an hour. Natural gas was found accidentally in his works. He started making gas-engines. He has two power-houses, one of 750 horse-power. George Westinghouse is a believer in gas. He says that the economies which result from the distribution of power by means of gas generated at central points, and conveyed in pipes along the lines of railroad for the operation of engines and electric generators, would justify the expenditure of large capital necessary for such installation in connection with the electric equipment of railways, particularly on metropolitan and suburban lines. You see from this something of the energy, tirelessness of a typical American work.

The management of a great American business concern is carried to its finest point in these mammoth shops at East Pittsburgh. Take that great aisle. There was being built a generator 45 feet high, intended for the New York Rapid

Transit Company, a great wheel, sister of the pyramids in size and generating an electric current sufficient to drive 600 street cars. It was the biggest thing of the kind ever made. It was being tested and would then be sent in sections to New York. No railway truck could carry it, no tunnel could let it pass through. But the sections were as big as possible and made within 1½ inch of the largest tunnel aperture.

The whole floor was of steel with thousands of bolt holes. There were the colossal cranes. They were not swinging-work to the machines. The work was so big that in all cases the machines had to be swung to the work. Everything was driven electrically. Some of the "tools," as big as a cottage, were "self-contained"—within the frame they carried a motor, and it simply needed the fixing of a button to set the thing working.

I went among these "tools." They were all busy with an intelligence that made the layman wonder. Six or seven big "tools" were thundering and cutting, and not a man near. "Haven't you a man to look after these?" I asked. "Oh, yes," was the reply, "but I suppose he is busy just now doing something else." Throughout the works were 1,750 "machine tools," from delicate watchmaker appliances, turning out jewelled bearings for sensitive measuring instruments, to making the framework of electric cars weighing 50 tons.

To the first glance everything seems confusion. But look at the door at one end of the shop, and you see rough, ungainly parts being brought in. Look at the other and you see finished machines being packed on railway trucks and despatched to their destination. The whole thing is clockwork. The scheme is one of dates. An order comes in to the main office. It is handed on to the twelve men in the production department. Every section of the works is informed of what is required, not simultaneously, but at proportionate dates, sometimes six months from one to the other. Every day's work is arranged to a nicety, so that the men working in the middle of the shop won't get a pile of stuff ready and block the way long before the appliances are wanted.

The making of parts is specialised. Often a workman does not know what he is really making. But he delivers on a certain day, and on that certain day another department is just ready to receive and advance the work another stage. Such an immensity of work is done that it takes fully six months for a motor to pass through all its stages in that quarter-of-a-mile long shop. But each day from that one aisle there leave sixty 200 horse-power motors for street cars.

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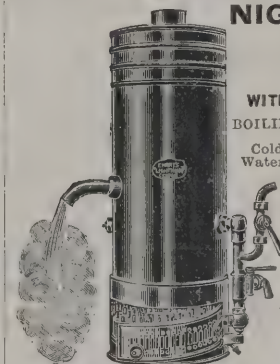
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That explains largely why of the 6,000 employées on this plant 1,200 are girls. It explains also how a man who was a clerk six months ago is now working in an electric shop; how, when a man is dismissed from watching a machine that punches holes, he is soon expert enough to look after a machine that cuts a groove. The standardisation of parts and the devoting of years to making the same small thing have the effect of converting men into machines and the machines into intelligent workers. You get men who work like lightning, but there is little of the artisan about them.

Yet there is room for brains. A man who can devise an improvement in a machine which will reduce cost and produce more—he is the man worth anything. The American working man knows this. He has largely got rid of the old-fashioned idea that he is doing an ill turn by displacing labour. He is doing a good turn for himself, and this is the thing that counts. An employer thinks little of a man who has no suggestions. The management are all eyes for the clever man or boy. There is no room for grumbling that a man does not get a chance. If a man misses chances in America he lacks the brains. All this is understood. When an American working man sees another do something ingenious he is positive he can do it also. Anyway, he tries. If he fails he knows the reason.

Specially did I inquire into the conditions of labour in the Westinghouse Electric Company. I saw that the secret of the enormous output was due to three things—standardisation, labour-saving machinery, enthusiasm of the men. There were a good many Englishmen employed. In regard to them it was the same story I had heard elsewhere. On their first coming they were slow. They were jacks-of-all-trades in electricity and master of none. But when they dropped into American ways of focussing all their energies on one thing they were able not only to hold their own, but often to beat the Americans.

One of the most interesting of men is Mr. Philip Lange, the manager of the works, who began, as most managers do in the States, at the bottom. He is a German, but with all the phlegmatic Teutonism soaked out of him—a man all nervous vitality, whose fingers are ever on the twitch, whose round grey eyes are ever on fire, but on whose features are the taut lines of years of anxiety.

We discussed the problem of labour, how most could be

got out of a man, and how was he entitled to be paid in the days of commercial warfare?

Fifteen years ago Mr. Lange began grappling with capital and labour issues. As far as the Westinghouse firm concerned, he thinks he has solved the riddle.

At first all the Westinghouse workers were paid day wages. He came to the conclusion that men, assured of a certain wage, were not putting forth all their energies. Then the piecework system was adopted. That didn't satisfy him. Men produced a little more, but not much. He decided that there was "soldiering" men were not earning all they could by piecework. "Ca'd canny," because they were suspicious that if they earned high wages the piece price would be cut, and they would be coaxed into still more hustle, which would mean still another cut. Then he adopted the premium plan. He called all the men together and said that on the basis of their piecework they would get the same pay for the same amount of work, but they could do in eight, or seven, or six hours what had previously taken them ten hours to do, then all they made in the remaining two, three or four hours—to make up the ten-hour day—they would get half and the company would get half. This was, in all truth, a premium on hustling.

Many of the workers hung back because they were suspicious of its being a scheme to see exactly what could be got out of men, and then cut their wages so that they would have to keep up a greater strain of energy to earn what they had previously earned with comparative ease. Mr. Lange, however, made a bargain. He gave a definite undertaking that he would not cut for a year, and there should be no cutting then if trade continued good. He talked business and not philosophy. He wanted to make more money for the company, he wanted to produce things cheaply, which he could do by obtaining several hours at half the previous rates; he wanted to get all the work he could out of the men, and for the benefit in their week's earnings for the same number of hours' work, without a dread that it would be said they were making too much.

For six years now the scheme has been in operation in all the machine-shops. It has worked admirably. With a single Mr. Lange told me that most of the piecework formerly done in ten hours is now done in seven, and in some cases the time has been cut down to even four hours. Yet for the four hours' work the man gets the pay he formerly got for the full ten hours' work; turning out twice and a-half as much as formerly he gets nearly twice as much in wages.

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The other day a foreman came to me and said that one of men was earning too much. He was making 63 cents (7<sup>1</sup>/<sub>2</sub>d.) an hour, while three men alongside him doing the work were making 34 cents (1s. 5d.) an hour. Now, that tremendous wage for a mechanic—24s. a day. I wouldn't n to the talk about cutting his wages. If I had done so confidence the men now have in me would be gone. It is r present confidence that makes them press every nerve the service. And what reason have I to complain? old that we had hundreds of men earning 63 cents an hour. e that under my 50 per cent. premium arrangement the e they earn for themselves the more they earn for the firm, the men see that the more they turn out for the firm the er it is for themselves."

"And what use do they make of their high wages—do they ?" I asked.

Mr. Lange smiled, and then he laughed. "When an lish or German workman comes to this country and brings wife with him he will have a banking account in six months, own his own house within the year. But if he comes here marries an American girl—why, he'll never know what a king account looks like."

## PROPOSED COLLEGE OF SCIENCE IN DUBLIN.

Monday a deputation from the Dublin Corporation waited e Chief Secretary at Dublin Castle to urge the desirability proceeding without delay with the Bill proposing to olish a college for applied science in Dublin.

Mr. Thomas Pile said the Corporation were anxious with rd to the present position of the Bill promoted by the ernment with a view to expend 280,000l. on a College for ied Science in Ireland. They believed that the Govern- ment would find amongst the architects of Dublin men quite l to the erection of any such building as the Government it require.

The Chief Secretary said that the Bill passed the second ing, and is still alive, though in a state of suspended ation. The present Bill could, therefore, be passed during utumn session. Mr. Austen Chamberlain, at that time ncial Secretary to the Treasury, proposed referring it to mmittee. Unless the Bill go to a committee its chance eing passed during the autumn would be very slight. e would not yourselves be prepared to see this Bill in-

definitely postponed upon the question of a site. You would not yourselves be prepared to see this Bill indefinitely postponed on the question of an architect, though I gather from you, and I take a note of it, that an architect can be found in this city competent to undertake a task even of its importance. You have mentioned a figure of 280,000l. The Bill provides only a sum of 225,000l. for this specific purpose, the acquirement of a site and the erection of a Royal College of Science, and such other public offices as may be determined—a site only and only a building for the college of science. The adaptation of the houses, which are not of so palatial a character as to stand in the way of this scheme, may be provided for by a vote of 9,500l. upon the Public Works vote in ordinary committee of supply. The acquisition of so large a site would have been extravagant, unless we had also been able to contemplate utilising some portion of it for other purposes. At the present moment some of the officials of the Irish Government are not properly housed according to modern standards of the amount of cubic feet of air which ought to be given to any man who is doing hard and responsible work. Many of those who are in the public service of the country are not housed as well as any big captain of industry would house his own clerks. But by combining that also with the possibility of giving proper accommodation to some of the officials in the Local Government Board and making a general shunt around the offices, we were able to acquire the assent of the Treasury to a comprehensive scheme, embracing now three proposals—a proper college for applied science in Dublin, a proper habitation for the new department of agriculture and technical education, the two in close proximity, and certain changes in other offices which would justify the acquisition of so large a site, and the embarking upon what would otherwise be described as a somewhat over ambitious architectural scheme.

The site was selected in Upper Merrion Street because you have a lawn in front of Leinster House; beyond that you have the National Gallery, forming a kind of pendant to any such block of buildings; and then behind, forming part of the same architectural scheme, you have the buildings of the library and of the museum built by an Irish architect. It seemed to me, to Mr. Chamberlain and to Mr. Holmes, First Commissioner of Works, a thousand pities to miss an opportunity of dealing with such a plot of land in a manner which would be beneficial to the cause of science, beneficial to the new Department, and also, we hope, not unworthy of the architectural building s

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which stand in that neighbourhood. When the plan comes to full maturity and acquires the assent of Parliament during a succeeding session, you will have there a fine quadrangle, built as it should be built in every part, with a view to what the whole will one day become, and also with this consideration kept closely in mind, namely, that the whole, when complete, shall not conflict with the architectural charm—of a sober quality though it be—of the houses in Merriam Square and Leinster House. Ultimately there will be a quadrangle. The stables disappear, because the college of science takes their place. The trees—rather fine trees—which are now in back gardens will be a beautiful triangle, clumped in the midst of that quadrangle, and through the houses in Upper Merriam Street it will be possible to have arches through which the college of science will be seen on the other side of the quadrangle. It is important, in my opinion, that this Bill should go through. I should think it very imprudent to leave 225,000*l.* hanging in the air on the eve of the consideration of measures which I trust will be of considerable importance to this country. Therefore, what I would be glad to see is a general consensus of opinion that we should consider the site as settled, and that in the matter of the architect we should aim, in the first place, at finding a man who in building the first part of what will be a much bigger plan, will not either build himself or impose upon his successors the necessity of erecting some buildings which would not agree with the fine buildings you have there already. Keeping that before us as the primary object, the secondary object should be the employment of an architect in this city.

#### DEFECTS IN THE 1901 FACTORY AND WORKSHOP ACT.\*

THE Factory and Workshop Act of 1901 contains so many imperfections and serious omissions as to give one the impression that it was hurriedly prepared or unwisely curtailed. It occurred to the writer that a short paper giving prominence to certain defects in this Act, and indicating some of the

\* A paper by Alfred Greenwood, M.D., D.P.H., Medical Officer of Health for Blackburn, read before the Sanitary Congress in Manchester.

requirements which will be desirable in future legislation on this question, would prove of interest to this congress.

The first defect which suggests itself is that the new Act has failed to place the sanitary control of factories under local authorities. The local authority is responsible for the supervision of the sanitary conditions of its workshops and the district generally, and it is a strange anomaly that it does not supervise the sanitary condition of its factories, as nuisances requiring immediate abatement often occur therein.

Under the Factory Act the medical officer of health has no right of entry into a factory, but must wait until the factory inspector forwards his notice, which is often sent first to the clerk to the local authority and then handed to the medical officer of health. This is contradictory to the section under the Public Health Act which gives the local authority, on receipt of a complaint that a nuisance exists on any premises, the power of entry and enforcement of abatement of the said nuisance. This is an unfortunate mingling of Acts of Parliament. In Section 125 there has been an omission of the word "factories," which should have been included with "workshops and workplaces," in reference to the duties of local authorities.

The difficulty in dealing with sanitary defects requiring immediate abatement in factories may be illustrated by the following example:—On June 23 last, owing to the receipt of a complaint from the occupier of a paper mill, one of my inspectors visited these factory premises and found that a scum-pipe in the adjoining street was badly broken about 6 feet from the ground. This soil-pipe received the discharge of fecal closets, and the drain in connection therewith was blocked, with the result that each time the closets were used to excretal flush discharged like a shower-bath over the heads of passers-by and then ran along the street surface to the nearest gully. Inquiries showed that this nuisance had existed for ten days before. All I could do in this case was to inform His Majesty's inspector without delay of the existence of the nuisance. He then sent a complaint of the same nuisance to the town clerk, who referred the matter to me, and the nuisance was crossed off my books as having been abated on July 1. On other occasions I have seen water-closets in factories which through neglect have become very foul, but having regard to the fact that a sanitary authority cannot serve a statutory notice unless the factory inspector first gives the notice in writing, I could only call the attention of the factory inspector to these matters. Numerous other instances might be given, and I believe that these difficulties will increase.

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ch that our legislators will soon be compelled to amend their own recent amendments.

In the framing of the 1901 Factory Act many golden opportunities were missed of remedying several defects. The control of the sanitary provisions respecting factories should have been vested in the sanitary authority of the district in which they situate. Such places should be subject to the frequent inspection of sanitary officials, and the sanitary authority should also have the power to secure the imposition of a penalty for nuisances found in factories and workshops. This power is already possessed by H.M. inspector in the case of factories. Secondly, it is also anomalous that the introduction of a small engine into a workshop used in aid of a manufacturing process should transform such workshop into a factory. The sanitation of this building then leaves the hands of the sanitary authority and goes to the factory inspector. Thirdly, in the new Act some duties are referred to the Public Health Act and others to the Factory Act. For example, overcrowding, bad ventilation, blocked drains, filthy premises, in factories are punishable under the Factory Act without notice, but in a workshop the same defects (with the exception of the provision as to the ventilation by fan in certain workshops) are only punishable under the Public Health Act.

Also it is a complication that the Factory and Workshop Act and section 91 of the Public Health Act relating to nuisances may require enforcement for sanitary defects in the place of work. For example, if an occupier employs one or more persons the place of work is a workshop, and defects cleansing and limewashing must be dealt with under the Factory and Workshop Act, but all other sanitary defects in a workshop must be dealt with under section 91 of the Public Health Act. Yet, if the same occupier works there (not living on the premises) the place of work now becomes a workplace, and all sanitary defects must be dealt with under section 91 of the Public Health Act.

In the enforcement of the above provisions, tenement workshops, i.e. those in which rooms are occupied by employees independently, correspond with workshops, and domestic workshops correspond with workplaces. Again, if in addition to the family one or two employees work in a laundry section 91 of the Public Health Act applies for all defects; but if more than two employees, in addition to the family, work there, the Factory and Workshop Act applies for cleansing and limewashing. This appears to involve an overlapping of the two which is very perplexing, and might well have been avoided.

Fourthly, there does not appear to be any provision in the Act compelling an occupier of a factory to admit an official of the sanitary authority for the purpose of ascertaining if the fire-escapes are efficient. Under the present state of the law the factory occupier could refuse admission to the sanitary official.

Also section 14, dealing with certificates showing the provision of satisfactory means of escape in case of fire at factories built after January 1892, and in which more than forty persons are employed, is not of that definite nature which would facilitate its administration. It is not stated whether the owner or occupier is responsible for applying to the sanitary authority for the said certificate, and for receiving it from them in case the arrangements are satisfactory. Also, it is not stated who shall provide satisfactory means of escape in case the arrangements are not satisfactory. The owner is responsible in the case of factories built before 1892. In view of the recent fire in London it is most important that this section should be made more definite and complete; otherwise the section may be valueless.

Fifthly, that portion of the Act relating to bakehouses is truly complicated, and could not be called sound legislation.

In conformity with the remainder of the Act a bakehouse may be a factory or a workshop according as power is or is not used in the process of baking. But a bakehouse may be a "retail" or a "wholesale bakehouse." The term "retail bakehouse" is defined as any bakehouse or place, not being a factory, the bread, biscuits or confectionery baked in which are sold, not wholesale, but by retail, in a shop or place occupied with the bakehouse. The term "wholesale bakehouse" is not defined, and one is left wondering whether it refers to all other bakehouses which are not retail bakehouses, or all bakehouses which are factories, or bakehouses in which the confectionery is sold wholesale. It seems to be an unnecessary complication of the Act that bakehouses should have been differentiated in this way. A definition of the term "wholesale bakehouse" is required, and all bakehouses should be placed under the control of the sanitary authority.

Also, according to the new Act, the abolition for use as bakehouses of all unsuitable underground bakehouses, whether factories or workshops, will rest with the local authority in 1904. There is a lack of consistency in this arrangement, and it seems as if the unpleasant duty of the abolition of unsuitable factory bakehouses will be transferred from H.M. inspector to the official of the sanitary authority. In spite of this,

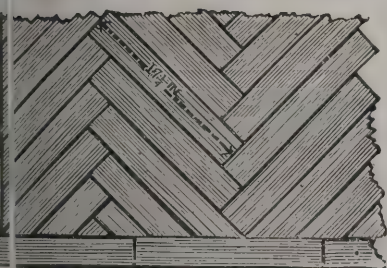
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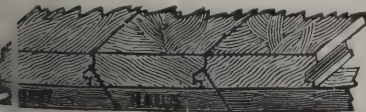
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however, it is to be hoped that all local authorities will take up a firm stand on this point and abolish as many underground bakehouses as possible.

Sixthly, section 11, which requires every steam boiler used for generating steam in a factory or workshop to be examined thoroughly by a competent person once in every fourteen months, and a report of the result of such examination to be entered in the general register of the factory or workshop, would have been improved if power had been given to the factory inspector to compel the enforcement of any recommendations made in this report, and if a penalty recoverable for neglect to comply with this had been included.

Seventhly, another example of confusion in the law is seen in the following. According to section 7 of the Act, sufficient means of ventilation in every room in any factory or workshop shall be provided and maintained, but in section 157 this requirement of means of ventilation in men's workshops has been nullified. It would appear from this that our legislators consider the ventilation of men's workshops of less importance than that of women's workshops.

Eighthly, the Home Secretary has recently drafted an order determining the conditions under which the accommodation in the way of sanitary conveniences provided in a factory or workshop shall be deemed to be sufficient and suitable within the meaning of section 9 of the new Act.

But this does not apply to London or places in which section 22 of the Public Health Acts Amendment Act, 1890, has been adopted, and in which the various councils have the duty of enforcing the provision of suitable and sufficient sanitary conveniences in factories.

Therefore the order can only apply to rural districts, and a few urban districts, and although it may be said that the requirements of this order will probably be used as a standard in districts where it does not apply, it would have been better to have made the order applicable to all factories and workshops.

#### GAS-ENGINES.

A PAPER on "Recent Progress in Gas-Engines" was read by Mr. H. A. Humphrey in the Engineering Section of the British Association at Belfast. The author traced the development of gas-engines, and pointed out the remarkable manner in which the size and power of this type of prime mover has grown,

especially within the last few years, a development which has but few parallels in the history of engineering enterprise. Gas engines of 1,200 and 1,500 h.p. were already working, and others of 2,000 to 4,000 h.p. were being constructed. In the Paris Exhibition of 1900 the 600 h.p. Cockerill gas-engine created much surprise, but now the makers had in hand an engine of 2,500 h.p., and were quite prepared to build one of 5,000 h.p. In this country the first gas-engines above 400 h.p. were started in 1900 and ran with Mond gas, but at the present time the two leading English manufacturers had delivered and had under construction fifty-one gas-engines of between 1,000 and 1,000 h.p. Two makers, Messrs. Crossley and the Premier Company, collectively supplied 17,600 h.p., of which 12,500 h.p. was for driving dynamos. Abroad, apart from all engines of less than 200 h.p., Messrs. Korting Brothers and their licensees had made or had under construction thirty-two gas-engines with a total of 44,500 h.p., averaging 1,390 h.p. per engine. The Société Anonyme John Cockerill and their licensees came next with fifty-nine engines having an aggregate of 32,950 h.p., so that the average size of the engines built by this firm was 558 h.p. The Gasmotoren Fabrik Deutz took the third place with fifty-one engines developing collectively 20,655 h.p.; and were followed by the Deutsche Kraftgas Gesellschaft and their licensees with engines numbering twenty-eight and giving 16,900 h.p. Although America had lagged somewhat behind the Continent in adopting large gas-engines, there was evidence that this state of affairs would not long remain. The Swan Steam Pump Works had only recently started the manufacture of gas-engines, yet they had already put to successful work gas-engines of 1,000 h.p. each, and were now constructing enormous gas-engine gas compressors of 4,000 h.p. each, the first to be running next November and the second by January 1903. The Westinghouse Machine and Manufacturing Company had made gas-engines of 1,500 h.p., and were prepared to build sizes up to 3,000 h.p., either horizontal or vertical. The author described the principal engines mentioned and dealt with improvements in construction, briefly considering types of engines with a view to show upon what lines development was progressing, and to indicate the kind of machine which might be expected to prove the most successful in the future. In conclusion the author pointed out that the future of gas-engines for central station work depended on the ability of gas-engines to drive alternators in parallel, and he gave numerous instances in which this had been accomplished in regular work.

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# The Architect.

## THE WEEK.

EMILE ZOLA was usually considered only as a novelist, but his Italian extraction was shown in other forms. He was a lover of art, and there is no doubt his influence was of some account in the formation of the realistic school of France. At a very early period of his career he wrote articles on art in which he upheld truth as the foremost of needs. He was, in consequence, opposed to the whole system of official art teaching in which the Académie des Beaux-Arts was the agent. His idol in those days was EDOUARD MANET, and he sympathised with the painter when his nude figure was excluded from the Salon. ZOLA's aim was to produce several novels which should be closely connected, and in which the peculiarities of many types of French people would be revealed. Hence the Roujon-Macquart series arose. Another bond of connection between them was to be found in the operations of hereditary qualities according to the theory of Dr. LUCAS. Mental weakness to some degree was exhibited in the principal characters as if it were inevitable. When in its turn French art had to be treated, CLAUDE, the hero of "L'Œuvre," was presented as an able and honest artist who struggled with many difficulties, but who was doomed to failure, partly because he had inherited the family affliction and was liable to nervous crises, partly because he was living under a Government which endeavoured to corrupt art. The circumstances attending the rejection of MANET's picture were revived and utilised in the novel. In "L'Œuvre" ZOLA showed himself to be most industrious in gathering details, and the life of young painters was displayed with photographic fidelity. There are also allusions to the manner in which French architects obtain their designs, for ZOLA knew that "ghosts" were more of a necessity to them than to painters and sculptors. Of late years French opinion was inimical to ZOLA, because he could not flatter the people or conceal the faults of the Government, but his work never flagged. More noteworthy books were to be expected from his pen, and it is pitiful that so clever and courageous a man should lose his life through a badly-constructed stove. Considering the character of the French apparatus for heating, it is a surprise that many other deaths from suffocation are not recorded every year.

THE Château de Grignan, in Provence, was lately in the market. It has been purchased by the Count and Countess DE CASTELLANE. It is an ancient building, but if it is more often spoken of than the majority of French castles the reason is that its châtelaine was at one time the daughter of Madame DE SÉVIGNÉ, and to whom the famous letters were addressed. An ordinary reader is not much impressed by the Countess DE GRIGNAN from what her enraptured mother says of her. She evidently looked on herself as one of the greatest women in France. But she was in a position which was difficult to fill, and her circumstances may have had much to do with that coldness which, after perusing the letters, we must ascribe to her. Her husband, who married her when she was almost a child, was a lieutenant-general, and he was in debt when he made his third marriage. His château, from what we see of it to-day, was evidently at one time extensive enough to serve as a royal palace. Nobles were induced to consider vast buildings as indispensable, and the French kings and their ministers kept up the delusion in order that the owners might be in financial straits. The Château de Grignan was not only costly to keep up, for it was always crowded with visitors, but it had also gained some notoriety for the excessive gambling that was carried on within it. The host and hostess believed it was a necessary part of hospitality to play for larger stakes than any of the guests. Then the Count had a mania for pictures and furniture, and in his progress through the country was accompanied by as many equestrians as would form a modern circus. It was in vain Madame DE SÉVIGNÉ with her charming good sense endeavoured to remonstrate with the spendthrifts. At times she seemed almost driven into a passion by their extravagance. The end came, and it was necessary for

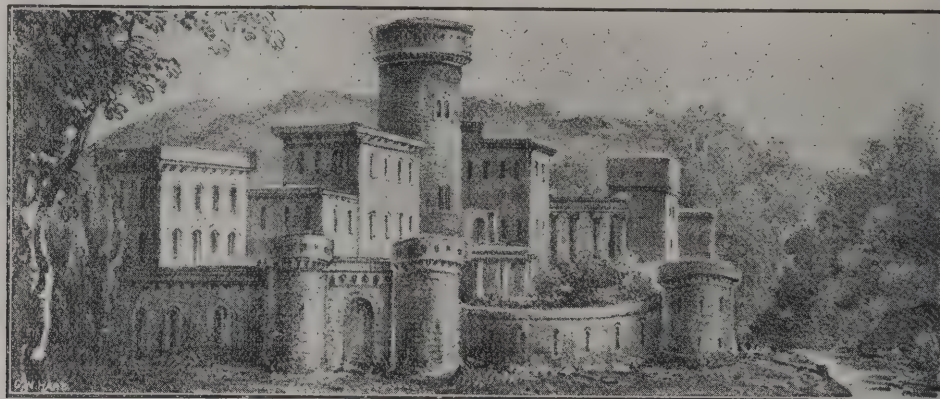
Madame to give up her residence in Paris and reside in what seemed to her eyes to be a savage country in order to help her luckless daughter and son-in-law.

THE committee of the Melbourne Hospital have generously invited architects throughout the world to compete for a new building, with accommodation for 500 patients. But it is doubtful whether many architects outside the city will be tempted to join in the contest. There are only two prizes offered—one of 250*l.* and one of 100*l.* The medical staff are in favour of a five or six-storey structure. It is, however, uncertain when the building will be erected, for it is admitted that twenty years may elapse before completion is attained. The financial condition of the hospital is not flourishing. Sanguine people believe that the committee possess 30,000*l.*, but at the end of the present year it is expected the expenditure will exceed the income by 4,000*l.*, and besides, there is a large overdraft to be settled. It is objected by some that if plans were now prepared they would be antiquated at the end of fifteen or twenty years, when an attempt might be made to commence operations. In reply, it is said that there is no likelihood of any great revolution in hospital construction, and if there should be it will only relate to internal arrangements. The truth seems to be that the committee are eager to gain credit by appearing as active, and it is supposed that if plans could be exhibited subscriptions might come in. Architects throughout the world are imagined to be willing to aid in such enterprises, regardless of the inconvenience to themselves.

FRENCH artists are generally glad to accept the invitations to compete for works in other countries. But reciprocity is not strong among them, and in consequence it is very rare to find international competitions in France. A project which has just arisen relates to one in which foreign artists can take part, but it is doubtful whether it will ever be finally arranged. An anonymous benefactor, it appears, has left 200,000 francs to the city of Rheims for the erection of a monument. Nothing was said about the work, whether it was to be an allegorical figure, a fountain, a statue of a citizen, or other memorial. The municipality decided to arrange a competition, and to leave the character of the subject to be determined by the artist. A stipulation was made, however, that in designs for fountains it was not to be assumed that an unlimited supply of water was available. It was also resolved to allow foreign artists to compete as well as Frenchmen. The latter clause has excited much indignation in France. It is considered that the authorities have been exceeding their powers, as in a country where so many sculptors lived no necessity existed to go elsewhere for a model. The municipal councillors are declared to be Socialists who are *sans patrie*, and give themselves up to providing for the welfare of humanity at large. Why should not France for once show a little liberality, and give their neighbours the pleasure of matching themselves on equal terms with native artists? No objection was raised in Liverpool when foreign designs for the cathedral were exhibited, although the work to be sought would be far more costly than the Rheims memorial, and bring greater advantage to the winner.

AN effort is now being made in France to bring influence to bear on the War Department in order that the schools and colleges should not be utilised during vacations as barracks by troops. Economy in such cases is prized, while sanitation is undervalued. It is, no doubt, hard to find accommodation for the immense number of reservists who have to be called out for instruction. A large empty building is, therefore, tempting in the eyes of the Staff. On the other hand, it has been ascertained beyond dispute that several epidemics have followed the tenancy of the schools by soldiers. The germs may not in all instances arise in the men, but their presence prevents the cleaning and aeration which should take place in the holidays. In connection with the movement for keeping out the troops, the French doctors are endeavouring to introduce the teaching of the principles of hygiene, which, as every tourist agrees, appear to be unknown not only in schools and colleges, but in hotels and other buildings throughout the country.





PAINTERS' ARCHITECTURE: CLAUDE.

## GILBERT WHITE AS ARCHÆOLOGIST.

PAROCHIALISM is commonly supposed to be inseparable from narrow-mindedness. As SHAKE-SPEARE said, "Home-keeping youth have ever homely wits." In an age like the present, when facilities are given to enable observation to obtain extended views and survey mankind from China to Peru, a mere stay-at-home traveller is considered to be an anomaly. Occupation is, however, to be found alike for all who wish to traverse the earth in order to obtain materials for study, as well as for those who from various causes have to accept the lot of being cabined, cribbed, confined within a limited area. It is impossible to lay down bounds which are sufficient to restrain men's thoughts. "Stone walls do not a prison make, nor iron bars a cage" for the mind. XAVIER DE MAISTRE was able to have an adventurous voyage around his chamber, and ALPHONSE KARR another around his garden, which was not, however, completed as quickly as a friend was able to reach a distant region and return. The accounts of the two travellers will be thought far more entertaining than many large records of journeys to remote parts of the world.

The Rev. GILBERT WHITE, M.A., was therefore not to be pitied, for he could have the whole parish of Selborne "in latitude 51 degs., and near midway between the towns of Alton and Petersfield," as a field for investigation. It was very large and extensive and abutted on twelve parishes. The account of his observations, it is needless to remark, has been recognised not only as one of the most interesting books relating to the natural history of England, but as evidence that a man may become very parochial and yet be a most useful revealer of neglected truths. "What make ye of Parson WHITE in Selborne?" asks CARLYLE. "He had not only no great men to look on, but not even men; merely sparrows and cockchafers: yet has he left us a Biography of these, which under its title, 'Natural History of Selborne,' still remains valuable to us, which has copied a little sentence or two faithfully from the Inspired Volume of Nature, and so is itself not without inspiration." WHITE has had successors who in accepting a circumscribed area for operations, have on that basis formed expansive views of creation. The American THOREAU is perhaps the most noteworthy among them. For most Englishmen "The Natural History of Selborne" has taken rank as a classic, and it is among the books which are likely to be reprinted while their language endures.

It is, however, characteristic of the limitation of popular interest and the strength of popular prejudice that in the majority of editions the natural history is alone presented. The author likewise treated of the "Antiquities of Selborne." His aim was, as he declares, to suggest what a parochial history should be in which natural occurrences as well as antiquities were described. To secure particulars about the history of Selborne he had the archives of Magdalen College, Oxford, explored, and he was undoubtedly at great pains to obtain accurate information about ancient life, although, as we have mentioned, that part of his book seems to possess no value in the eyes of publishers, and is not sought after by the public.

It is well, however, to understand that GILBERT WHITE pursued a different kind of archæology to what is now in fashion. In dealing with natural history his descriptions make no pretension to scientific exactitude. He may refer, for instance, to the colour of a bird, but he rarely attempts to present the details which would satisfy a physiologist. What he always desires to express is the life of the animal, its habits and customs. Thus when he was able to own a tortoise he spoke of the opportunities he would be afforded for observing its mode of living and propensities. In the same spirit, when treating of antiquity, he was regardless of what BURNS called "auld nick-nackets," but wished rather to ascertain facts about the men and women who possessed them. Moving beings are the subjects he prefers, and he is in a great measure indifferent to anything in which he cannot see more or less relation to something that was organised. For example, Wolmer Forest may or may not have existed as a royal domain before the Conquest. If it did not, he says we may suppose it was laid out by some of our earliest Norman kings. A primitive forest planted by different operations was of no account in his eyes. The grandeur of the trees required at least a monarch as director.

A church at Selborne is entered in Domesday Book, of which RADFRADUS was the priest. GILBERT WHITE says:—"How many fabrics have succeeded each other since the days of RADFRADUS, the presbyter, we cannot pretend to say." A modern archæologist would endeavour, if only by the aid of fragments in the existing building, to make out the churches that stood on the site. But the vicar knew little about details or of the characteristics of the various periods of Gothic. Although he believed the pillars, being of the low, squat, thick order, were Saxon, and may have been used in older buildings, yet from "the blunt Gothic arches" he considered the church was of no earlier date than the beginning of the reign of HENRY VII. The windows he described as being of the simple and unadorned sort called lancet. Part of the roof was covered, in WHITE's time, with oak shingles, which he preferred to tiles, for, as he said, "shingles well seasoned and cleft from quartered timber never warp nor let in drifting snow; nor do they shiver with frost; nor are they liable to be blown off, like tiles; but, when well nailed down, last for a long period, as experience has shown us in this place, where those that face to the north are known to have endured, untouched, by undoubted tradition, for more than a century." Selborne Church does not in disposition exactly correspond with the cardinal points. He accounted for the deviation by saying that the workmen were employed during the longest days, and tried to set the chancel to the rising sun. The vicarage, which is near the church, must in pre-Reformation days, he thought, have had the hall open to the roof. When the vicars became family men and wanted more accommodation, then, he believed, they flung a floor across the hall and by partitions divided the space into chambers.

GILBERT WHITE would gladly have recorded any acts of the vicars which were worth notice, for his family was long connected with Selborne. He found there was a WILLIAM WHITE, who held the living until 1594, but all he



can say of him is that he twice entered in the register the funeral of Bishop COWPER, of Winchester, as if that prelate had been buried at Selborne. It is known, however, he was interred at Winchester, near the episcopal throne. Of his namesake, GILBERT WHITE, who was instituted in 1681, more is related. We learn that "At his first coming he ceiled the chancel, and also floored and wainscoted the parlour and hall, which before were paved with stone, and had naked walls; he enlarged the kitchen and brewhouse, and dug a cellar and well; he also built a large new barn in the lower yard, removed the hovels in the front court, which he laid out in walks and borders, and entirely planned the back garden, before a rude field with a stone pit in the midst of it." By his will he gave and bequeathed "the sum of forty pounds to be laid out in the most necessary repairs of the church—that is, in strengthening and securing such parts as seem decaying and dangerous." With this sum two large buttresses were erected to support the east end of the south wall of the church, and the gable-end wall of the west end of the south aisle was new built from the ground. The terms of the will enable us to realise the state of decay into which the church and vicarage had fallen. The vicar also bequeathed 100*l.* to buy land, and the rent was to be utilised in teaching poor children to read and write, say their prayers and catechism, sew and knit. He also left 200*l.* for the repairs of highways in the parish.

Of more archæological importance than the parish church was the Priory of Selborne. It was founded by PETER DE LA ROCHE or DE RUPIBUS, a foreigner, who was a favourite of King JOHN, by whom he was appointed Bishop of Winchester, Lord Chief Justiciary, and he held other important offices. During the minority of HENRY III. he was Protector of the kingdom. He was a munificent prelate, and built a church and constructed fortifications at Jaffa in Palestine, besides creating many religious establishments in this country. A year after his return to England from the Holy Land he undertook the building and endowment of Selborne Priory. It was intended to provide for Canons Regular of the Order of St. AUGUSTINE. The prior appears to have been vested with some of the authority of a bishop in the district, for Sir ADAM GURDON, who was a soldier of fortune living in the locality, obtained permission from him to build an oratory in his manor-house, then a rare privilege, while some years after there was a second case. GURDON was a benefactor to the priory, and he presented a piece of ground, known in the village as "La Playstow," as a playground.

In the next century the priory was officially visited by WILLIAM OF WYKEHAM, and the records show that the bishop, who was so devoted to architecture, was a particularly severe inquisitor, and stern in punishing any departure from monastic rule. He found several of the canons ignorant and illiterate, owning manors and farms, which they visited without permission; that they were hunters and sportsmen, kept hounds and attended various matches. Meanwhile the priory walls and enclosures and the houses and tenements belonging to the institution were allowed to fall into a dilapidated condition. All defects of masonry were ordered to be repaired within six months under pain of suspension. Foppish ornaments were condemned, including garments edged with costly furs, fringed gloves and silken girdles. The altar-plate, clothes and vestments were carelessly kept. Some of the relics, plate, vestments and books had been pawned. All such property had by his command to be immediately redeemed. WILLIAM OF WYKEHAM on another occasion was more merciful, for he discharged the whole of the debts of the canons, and a few years before he died he bequeathed 100 marks to the priory. Bishop BEAUFORT, of Winchester, was a less sincere friend, for the Pope had to interfere to prevent an important part of the property being alienated for the support of the cathedral. In 1462 it was necessary to issue a power of sequestration against the priory on account of the dilapidations, which threatened ruin to the buildings. The document was respected, and repairs to a considerable amount were carried out. There were evidently dissensions amongst the canons which the bishops were unable to overcome. In 1486 a Bull was received from the Pope suppressing the priory, after it had been in existence for 254 years.

WAYNEFLETE, Bishop of Winchester, founded Magdalen

College, Oxford, about 1449. As the property of the college was insufficient to meet the expenses, the estates belonging to the deserted priory were assigned to it. But the authorities of the college were not disposed to act the part of good tenants. What followed has been described by GILBERT WHITE, and it suggests that in the years immediately preceding the Reformation and the seizure of ecclesiastical property by HENRY VIII., ecclesiastical buildings were allowed to become ruinous from other causes. WHITE says:—

No sooner did the priory (perhaps much out of repair at the time) become an appendage to the college, but it must at once have tended to swift decay. Magdalen College wanted now only two chambers for the chantry priest and his assistant, and therefore had no occasion for the hall, dormitory and other spacious apartments belonging to so large a foundation. The roofs neglected, would soon become the possession of daws and owls, and being rotted and decayed by the weather would fall in upon the floors, so that all parts must have hastened to speedy dilapidation and a scene of broken ruins. Three full centuries have now passed since the Dissolution—a series of years that would craze the stoutest edifices. But besides the slow hand of time many circumstances have contributed to level this venerable structure with the ground, of which nothing now remains but one piece of wall of about 10 feet long and as many feet high, which probably was part of an outhouse. As early as the latter end of the reign of Henry VII. we find that a farmhouse and two barns were built to the south of the priory, and undoubtedly out of its materials. Avarice again has much contributed to the overthrow of this stately pile, as long as the tenants could make money of its stones or timbers. Wantonness no doubt has had a share in the demolition, for boys love to destroy what men venerate and admire.

It is remarkable that WHITE should mention that "a large Doric capital worked in good taste" had been brought to light whilst digging among the foundations for materials to mend the highways. But as he conjectures that a base, also discovered, belonged to the column, we suppose capital and base formed parts of a plain moulded Gothic capital.

The Knights Templars owned much land at Selborne, and had a preceptory at Sudington within a mile of the village, but there are no remains of the building. The Templars and the priors lived on good terms.

GILBERT WHITE's devotion to Selborne was characteristic of his nature. When he was twenty-four he was elected a Fellow of Oriel, and if he were ambitious he could have obtained promotion in the Church. He rejected all the college livings which were offered. The vicarage of Selborne was the goal he kept before him, and once he was back again in his native village, with which his family were long connected, he had no wish to go beyond it. After his death there was a desire to have a portrait of him placed among the worthies of Oriel, but not one sketch of him could be met with. Every reader of his book must trust to imagination for the author's appearance. No naturalist has been more genial in his descriptions. He never poses as a philosopher, and yet he gives continual proof of his ability to see good in everything. As an archæologist there was not much to be met with in Selborne for his study, and he could not be persuaded to seek elsewhere for the knowledge which could have supplemented his investigations in the village. He may have thought that to do so would suggest incompleteness in Selborne. Everything in it was to him enjoyable and worthy of praise, as when he says that the freestone of the place makes elegant fronts for buildings, equal in colour and grain to Bath stone, and superior in never scaling; that it was closer and finer than Portland. Then there comes the forest stone which had also many excellent qualities, and which by way of ornamentation the masons used to chip into small fragments about the size of the head of a large nail, and stick the pieces into the mortar joints of the freestone walls. "This embellishment," writes the gratified vicar, "carries an odd appearance, and has occasioned strangers sometimes to ask us pleasantly "whether we fastened our walls together with tenpenny nails."

A British exhibition of arts and crafts was opened at Budapest on Sunday. It is under the direction of Mr. Lyon Thomson and is likely to be successful.



## INTERNATIONAL ENGINEERING CONGRESS.\*

THERE is an essential difference between the congresses of engineers and those of architects. The reason is that in the latter the personal element is dominant. No matter whether the congresses are held in America, France, or England, if the essays which relate to architects, their education, fees, competitions, &c., were prohibited, there would be little left to engage attention. Civil and mechanical engineers when they meet have so much to talk about in the way of modern inventions or arrangements, no time seems to be left for the consideration of questions which affect themselves except in a strictly professional sense. The report of the engineering congress which took place in Glasgow last year exhibits the peculiarity to an extraordinary extent. Even the speeches at the banquet possessed a business character. The conference has been only lately established, but there is no jealousy about its existence. The principal engineering societies have aided in its promotion. Sir WILLIAM PREECE announced the congress in his introductory address at the Institution of Civil Engineers; his successor, Sir DOUGLAS FOX, acted as chairman of the London committee. Mr. MANSERGH, a third president, undertook to preside at the meetings. In various other ways assistance has been given, and, in consequence, the Glasgow gathering was an undoubted success.

The sections which have been formed represent railways, waterways and maritime works, mechanical engineering, naval architecture and marine engineering, iron and steel, mining, municipal engineering, gas and electrical engineering. The diversity of subjects which belong to the engineer's profession is so remarkable that Mr. MANSERGH, the president, was justified in wishing that the vocation should be called "ingeniering" rather than "engineering." At present "engine" has gained a significance which was not attached to it, and it would be better to suggest by the title "ingenious," "ingenuity," &c. The American definition which describes the engineer as a man who can do well for one dollar things that anybody could do somehow for double the money, comes near the truth. For, according to Mr. MANSERGH, "all other things being equal—adaptability, soundness, efficiency—the engineering work which costs the least money is the best." In saying this, the President had an opportunity to gird at professors, and he recounted the legend of one who was shocked at the thought of steam-engines being made for money, to sell like cakes. On the subject of Great Britain's industrial position, Mr. MANSERGH expressed himself in a way which should be remembered:—"Brains are no peculiar possession of our nationality. The cosmic forces are the same everywhere. Economic conditions tend to wear down to a uniform level. Science knows no frontiers. The engineer is the truest free-trader. He goes whithersoever he is wanted and finds most to do. Will he in future flourish best in Britain or abroad?" The answer which many people would now give would be that future success depends entirely on the introduction of new systems of technical education. Mr. MANSERGH says there cannot be too much of it; but he adds:—"Nevertheless, I hold liberty to be more precious than learning. The fullest freedom for the exercise of the inborn spirit of initiative, enterprise and adventure is the next essential to the occurrence of this spirit in the individual members of a race, for enabling the whole to make headway in the universal struggle for life and for a leading position." He also points out that with the best of intentions Parliament can pass laws which are not advantageous to engineering. The effect of the Electric Lighting Acts has been to create a great many petty divisions of work. Years elapsed before an English engineer could arrange an electrical power contract amounting to 100,000*l.* The result is we have lost our chance, and shall probably have to adopt other people's plant, instead of striking out our own line like the less governed engineers who were connected with railways and shipbuilding.

Sir GUILFORD MOLESWORTH gave an account of the Uganda Railway. The first European who had penetrated the region was Mr. JOSEPH THOMSON, who made a hurried visit in 1888. It was therefore very difficult to decide about the laying out of the line. When the work was commenced almost all the labour had to be derived from India. We are told that the construction involved an organisation equivalent to the maintenance of an army of 15,000 men in a practically waterless country, devoid of resources and of all means of animal or of wheeled transport, with a base of operations to which everything had to be imported from a distant country. A condensing plant and a corn mill were indispensable adjuncts. The route was difficult. The ruling gradients sometimes were 1 in 30, and in one place the gradient was 1 in 2. Wild beasts and insects whose sting was fatal abound throughout the first 250 miles; 28 Indian labourers fell a prey to lions, and a police force of 200, as well as a complete hospital staff, had to be maintained.

The military railways in the Soudan were treated by Major MACAULEY. Steel sleepers are necessary on some sections owing to the prevalence of the destructive white ant. Sand also causes an abnormal wear and tear of materials. One length of 99 miles is liable to be washed away, but the risk is accepted rather than incur the expense of a safer line. There are two fast trains weekly to Khartoum. Mr. JAMES BARTON again brought up his project for a tunnel between Scotland and Ireland. The cost is estimated at 10 millions sterling, but finance is the chief difficulty. Until a heading has been run from the Irish side past the junction between the sandstone and silurian, no contractor is willing to undertake the tunnel at a fixed sum; to do this, however, would probably not cost more than half a million, and a heading through the whole 34 miles is put down at 2½ millions. The political effects of such a work are not easy to judge, but there is no question that it would aid in overcoming that feeling of isolation which fosters agitation in Ireland.

A description of the Dortmund and Ems Canal was furnished by Herr HERMANN. It is 168 miles in length, and the arrangement of locks and lifts is very ingenious; one lift entailed an expense of 130,000*l.* The total cost of the canal was about four millions sterling. The lifts are worked by electricity, and electric towage will shortly be introduced. A paper on the plant used on the Chicago Drainage Canal works gives an account of some of the "conveyors" which are employed for delivering the excavated material to the spoil area. One removes 968 cubic yards in ten hours; another takes 400 cubic yards a day. It is said that "this gigantic work is bound to exercise a wonderful influence as an educator, and embolden men to undertake enterprises more vast than were considered practicable before its success had been demonstrated. The great array of mechanism brought into being for its construction, which earned vastly more than it cost to produce, was, most of it, without a sphere of usefulness after the work was completed, and was dismantled and sold for the value of the raw material." Papers were read on irrigation in the Nile Valley; on a waterway between the White Sea and the Baltic Sea; on the improvement of the Lower Mississippi; on the Danube improvements; the Clyde and its estuary; the improvement of the Bilbao River, and other subjects, which show how much importance is now being attached to canals and rivers. The Clyde seems to have had a remarkable influence on the growth of Glasgow. When the improvement of the river was commenced there were 40,000 inhabitants; the city has now 760,406. The revenue has expanded from 147*l.* to 441,419*l.*; the accommodation from 2½ acres to 206 acres of water and from 262 yards of quay to 15,115 yards.

Several interesting papers were offered in the section of iron and steel. In three of them the history of the production of the materials in Scotland is narrated. A report was presented advocating the unification of terms as far as possible in metallography and geology. The Iron and Steel Institute is collaborating with the German engineers in the compilation of a great international technical lexicon. It was recommended that wherever possible terms familiar to the mineralogist and geologist should be used in describing the structures of metals and alloys, and that the coining of new words should be deprecated.

\* *International Engineering Congress (Glasgow), 1901.* Report of the Proceedings and abstracts of the papers read. With a preface by Robert Caird, LL.D., chairman of the Executive Committee. Edited by the general secretary, J. D. Cormack. (Glasgow: William Asher.)



In the section of mining Mr. G. L. ALLEN dealt with the modern methods of brickmaking. He divided them into plastic, dry-press and semi-plastic, and informed the meeting that the manufacturer who wished to found a successful business must satisfy himself at the beginning as to which method was most suitable for his material. The old-fashioned open-air drying is becoming a thing of the past, and is superseded by drying-floors and tunnel-driers. The older type of kilns is also being supplanted by the continuous kiln. The following information is given concerning dry-press bricks:—

Up to the present time little has been done in this country in the making of dry-press bricks, though in other countries, particularly in the United States, the best quality of facing bricks is made by this system. Where it has been tried in Britain it has not been altogether successful, but this result is due to a want of knowledge of the material best suited to this method and ignorance of the machinery best fitted for it. Briefly stated, the method is as follows:—The clay is first thoroughly dried, preferably by being left for some time under a shed with a hot floor. It is then thoroughly ground in perforated mills, and being next elevated to the top of the building, it is then sifted, the finer particles of clay being delivered by rhones down through a hopper to the press, while the coarser material is returned to the mill. The fine clay is next delivered through a charger into moulds, where by plungers with increasing degrees of force it is formed into completed bricks. It is to be noted that different qualities of clay require different degrees of pressure. These bricks require more careful steaming and harder burning than the bricks made by the plastic method.

The paper read by the President of the Congress on the Birmingham Waterworks, of which he is engineer, suggested, among other things, the advantages of comfortably housing navvies. A temporary village for about 1,200 people has been raised, with the result that good steady men are constantly kept, which is a gain in so extensive an undertaking. Besides the huts there are schools, a recreation-hall, water and sewage works, baths and washhouses, a general hospital and one for infectious diseases, and a dosshouse which serves for tramps while in quarantine. The whole is under a village superintendent, who is also the bandmaster. The Corporation alone sell beer, and the profit is spent for the benefit of the men in various sports and entertainments.

Many other papers will repay attention. In one delivered in the electrical section it was stated that Lord KELVIN holds thirty-eight patents for electric instruments, of which particulars were given. The published proceedings of the congress may be said to typify the latest and most important inventions and discoveries in the wide field of engineering. It is true that in the majority of cases no more than abstracts of the papers are printed. But they will be found sufficient for the majority of students of practical science. In time the volumes must have unusual interest, and they will enable inquirers to ascertain where information on special subjects can be obtained, and in that way will facilitate researches.

### THE PARADOX OF THE PANTHEON.

THE Romans were the first people to realise the artistic value and develop the architectural possibilities of the groined vault and dome. By their means they obtained effects of unencumbered spaciousness impossible with columns and piers. Greek buildings remain to our day only as roofless ruins. The stupendous monuments of Egypt, rivalling those of Rome in magnitude, are chiefly open courts and colonnades with hypostyle halls, which, though roofed with stone, are encumbered by columns. In the Great Hall at Karnak the broadest aisle is less than 20 feet wide in the clear and not over 80 feet high. In contrast with these dimensions are those of the Baths of Diocletian at Rome, which have an unencumbered floor space of 340 by 87 feet, with a groined vault 90 feet high. The constructive methods by which the Romans accomplished the erection of these great buildings have been investigated by many architects, and are the subject of several valuable books. A systematic study and examination of Roman vaulting has never been undertaken, however, and in the most perfectly preserved and frequently visited of all Poman monuments, the Pantheon, the extraordinary contradiction between the construction and decoration of the magnificent dome,

though known for 150 years, has hardly been discussed. In 1894 Professor A. D. F. Hamlin, of Columbia University, observed certain facts which suggested a surprising explanation of this paradox, and after waiting in vain for some years for a solution from some other source, has discussed the subject in a series of papers in the *School of Mines Quarterly*, from which the following notes, says the *Engineering Record*, have been abridged with his permission. As a study in ancient Roman vault construction, apart from the Pantheon problem, the papers also merit the attention of all interested in the engineering and architectural methods of bygone days.

The true Roman system of construction is particularly interesting at the present time because it was based on the use of concrete. The architecture of the Egyptians and the Greeks was one of stone, and the construction of their great edifices was a tedious labour. When Rome, enriched by the spoils of worldwide conquests, began to build on a grand scale, the slow processes of stone construction were out of the question. She had enormous resources as respects rude labour, and the practical Roman builders accordingly devised a system of construction utilising this unskilled labour to the utmost, employing the relatively limited artistic resources of the empire so as to make a minimum of original design serve for a maximum of buildings. Hence the greater part of the walls, piers and vaults were concrete, and brick and stone were used only for facings.

The builders were economical in many respects. To support the enormous weight of the heavy concrete vaulting while it was setting would have involved a massiveness of timber construction for centerings which was deemed extravagant, and two other methods were adopted to accomplish the same end. Sometimes, over a very light wooden frame covered with slats a couple of feet apart, there was built a thin vault of large flat tiles laid in strong cement. These were covered in turn with smaller tiles breaking joints with the layer below. This made a strong elastic shell, which when loaded up to the haunches with concrete, was quite sufficient to carry the load of the concrete afterwards placed on the upper portion to complete the vault. The second method of construction, used in the larger vaults, was more complex. Cellular ribs of brick and tile were first built on light centres. Other centres were then fixed between the ribs, and the intervening space was filled with concrete. As these fillings, starting from the spring and growing a foot or two daily, hardened, they formed monolithic lintels between the ribs, bracing them against lateral overturning, and taking upon themselves a part of the weight of the next portion of the filling.

It is noteworthy that these admirable building methods eventually degenerated into matters of unthinking routine, and there are ribbed vaults where the ribs could have served no useful purpose. Even the Pantheon dating from the early part of the second century is full of solecisms. Lanciani declares that the beautifully executed discharging arches which are so noticeable in the upper part of the exterior brick facing are only one brick deep, and serve no constructive purpose. In the dome of this building the constructive ingenuity of the Romans appears highly developed and yet associated with the most extraordinary disregard alike of that economy of means and labour which characterises many phases of Roman building, and of the logical connection which in most great architectural works exists between the structural framework and the decorative dress. In the dome of the Pantheon these are not merely independent but are absolutely contradictory.

The Pantheon was built by Hadrian between 117 and 138 on the site of an earlier temple constructed by Agrippa. The portico is a reconstruction by Septimius Severus and Caracalla with materials from an older structure. The building is a circular edifice 142 feet in diameter, internally covered by a hemispherical dome 140 feet high, springing from the circular wall. This wall is 20 feet thick, but its seeming massiveness is reduced one-half by seven niches, n, figure 1, opening inwards, and alternately rectangular and semicircular in plan, an eighth opening forming the great doorway, and eight smaller semicircular chambers opening outward only through small windows. The eight large niches are capped by arches and half-domes. The wall appears to have been constructed in the usual way with facing of broad flat bricks and a filling of pozzolana concrete. The dome is sprung low enough to be inscribed within the square of 142 feet. The 28-foot oculus or eye at the summit not only lights the interior in the most beautiful manner imaginable, but relieves the dome of a great weight at its weakest point, while the carrying up of the exterior drum to one-third the height of the dome, and the series of external steps encircling the dome above it, provide for the loading of the haunches of the vault in the most satisfactory way.

Very effective, also, and admirably simple is the interior panelling of the dome with 140 plain rectangular coffers, each showing four sinkages except in the panels of the upper or fifth



tier, which have but three. The lower rails in each panel are wider than the upper ones in order to render them visible to a spectator on the floor of the temple. The paradox of the Pantheon is to be found in this interior panelled face of the vault.

The use of panels as a ceiling decoration lent itself readily to Roman methods of vaulting with brick ribs, which could be arranged to form the vertical members of the framework of the panels, while the horizontal members or rails could likewise be built of brick, forming a rectangular network of bricks sufficiently rigid when set to carry of itself the concrete filling and backing of the vault. But as a matter of fact few large vaults remain which show this system of construction. The great vault of Diocletian's Baths, now the church of S. Maria degli Angeli, is quite smooth and plain internally. Others, like the vaults of the side chambers of the basilica of Maxentius and Constantine, are adorned with polygonal panels, large octagons and small squares or other like combinations, which contradict any practical system of structural ribs. The one complete and monumental example of this kind of vault decoration is the Pantheon, and here, if anywhere, it would seem to be the natural thing to allow the ribbing of the vault panels to dictate the design of the structural framework of the dome. The interior aspect of the dome would naturally suggest a system of vertical ribs converging to the oculus, and a series of horizontal arches between them, framing the panels and stiffening the whole skeleton. But this is not at all the way the dome was constructed, and unfortunately it is impossible at present to say clearly how it was built.

The discordance between the lines of the panelling and the structural skeleton of the dome was first observed during repairs executed between 1743 and 1756, when an architect named Piranesi was enabled to study the construction. His drawings, figure 2, stated to be from measurements, show a framework of eight discharging arches over the eight niches or chapels, supporting eight massive ribs springing from their crowns and braced against disruption under this heavy load by a second tier of arches sprung from the haunches. This system of arches and ribs, harmonising with the general plan of the wall below, was generally accepted by students of Roman art until recently. The fact that its lines cut across those of the panels and that an eight-fold system is fundamentally inharmonious with one of twenty-eight parts, was of course patent to the most careless observer. But this did not discredit Piranesi's presentation of the structural framework of the dome, because this, if inharmonious with the panelling, was perfectly consistent with the eight-part design of the whole interior, and the panelling was generally considered as a decorative appliqué of ribs in relief, presumably in concrete or stucco, on the inner surface of the completed vault, as shown in Piranesi's cross-sections.

This explanation of the construction of the dome was questioned by Viollet-le-Duc in his famous "Dictionnaire." He suggested, figure 3, a preliminary skeleton of twenty-eight ribs and four series of horizontal arches, all of brick, light enough to be carried by trussed centerings; these formed the panelled design of the inner surface of the dome and served as a permanent centering for the construction of a more massive outer shell of arches and ribs after a modification of Piranesi's system. But this was merely a clever speculation of the French architect and has no basis in observed facts.

Professor Josef Durm, in his "Baukunst der Römer," discredits Piranesi's scheme by claiming that the latter could have discovered the ribs and arches only by cutting through the exterior cornice and steps around the base and haunches of the dome, and that, as there is no evidence of this, "one may be led to the conclusion that Piranesi was entertaining his readers with a figment of his own imagination." Durm accepts, however, the theory of two shells and two superposed frameworks, but he suggests that there are fourteen and not eight ribs, and that they are sprung directly from the wall and not from discharging arches. He seems to have overlooked the fact that in harmonising the framing and panelling he has thrown the framing and the walls supporting it out of accord. Moreover, it hardly seems likely that Piranesi would entirely invent his system at a time when the evidences of his fraud would be so entirely patent to other observers.

From a study of these data and theories, which he gives more completely in his papers, Professor Hamlin reached the conclusion that Viollet-le-Duc's assumption of two shells was reasonable, although without insisting on the order in which they were built. It was possible that the outer or Piranesi shell was built first and the panelled framework laid up afterwards, on the removal of the great centerings for the outer shell, by means of movable centerings hung from the outer framework. Each zone of the panelling would be self-sustaining as soon as completed. If thus constructed as an afterthought, perhaps when Septimius Severus rebuilt the portion, its discordance with the divisions of the dome framework is easier to understand. It was with this theory in mind that Professor Hamlin examined the dome in 1894. Two years earlier,

M. Chédanne had removed the stucco from three panels of the lower row in the dome and from several small areas near these. These bare spots were examined with an opera glass, as there was no scaffolding from which a close examination could be made at the time, and it was clearly seen that the whole structure was brick, ribs and filling alike. But the singular fact became apparent that it was not composed of structural ribs laid up as such according to the theories of Viollet-le-Duc and Durm, but the panelling was formed in the substance of the massive dome of brick, with discharging arches cutting at haphazard across the panels, as shown in figure 4. The theory of a double shell, as well as that of panelling in concrete added as an afterthought, was thus disposed of. The dome was a single massive vault of solid brick, an unusual construction in Rome; the panelling was formed in the brickwork itself and this brickwork was laid up in a series of discharging arches, for a part of its height at least. These were plainly seen to have been planned with reference to the chapels or niches below, and so far, at least, Piranesi was proved to have been correct.

But these facts merely shifted the puzzle, they did not solve it. The inherent contradiction between the twenty-eight panel ribs and the eight-fold design of the rotunda was not explained, it was accentuated. The 140 panels were a part of the dome itself. The only explanation of the contradiction to the satisfaction of Professor Hamlin is that the panelling was a decorative embellishment of the dome, which was originally intended to present a smooth internal surface, and that the panels were hewn in the solid brickwork after the completion of the vault. Professor Hamlin acknowledges that such a procedure is contrary to the assumed method of Roman construction; but the alternative solution, that the panels were formed during the laying up of the various discharging arches, assumes the use of moulds and of complicated special shapes of brick far exceeding the capabilities of Roman masons at the time this work was done. In Professor Hamlin's papers he explains in detail the intricacy of the masonwork necessary in laying up the relieving arches and their filling over the huge forms for the panels.

If the dome is supposed to have been built first, with or without a skeleton of arches and structural ribs extending through its whole thickness, and without regard to interior decoration, it becomes clear that this could be done with relatively light and simple trussed centerings. Chédanne has shown from his examination of the brickwork that the eight discharging arches are built like vertical arches, although with the inner faces shaped to the curve of the dome. If this is also true of a second row of arches, as in the Piranesi theory, all the lower part of the dome could have been built up nearly to half its height without centering. As a matter of fact, Piranesi's sections show all the masonry of the dome up to the level of the fourth row of panels laid up in horizontal courses, and with this Chédanne's observations agree. From that level it was possible to erect the eight massive ribs and the oculus at the top on skeleton centerings, spanning the opening with trusses either resting on the completed zone or supported from the floor of the rotunda. In figure 5 Professor Hamlin sketches a part of the dome carried up in this manner; he does not claim that this was done, but merely suggests that such a procedure was possible and comparatively simple if the builders did not concern themselves about the interior panelling. The dome being completed and the centerings removed, wholly or in part, the hewing of the panels subsequently would be a simple matter without endangering the stability of the vault. The work would be simple, within the ability of labourers of little or no skill, and remarkable only for its quantity and not its difficulty. That the panels were formed in this manner is the more credible because it allows the supposition that the interior decoration was designed quite independently of the construction.

But two objections have been advanced against the validity of this theory. Chédanne has reported that the surface of the bricks does not indicate cutting. But Professor Hamlin finds it easier to believe Chédanne mistaken in his observations on this point than to suppose the arches could have been built into the moulds without cutting or breaking the bricks; in most cases, he states, it would have been an absolute impossibility. On the other hand, the rough hewing of the panels, to be finished afterwards in stucco, might in many places have exposed such a serrated surface as Chédanne appears to have noticed, where the ends of brick came close to the hewing line.

The other argument is the fact that in the centre of each panel there is a bronze anchor set in the brickwork to hold a bronze rosette or other ornament. It is not impossible that these were set in the brickwork after its completion, as such an operation is common enough in modern work. But even were this not so, it would simply prove that the panelling had been conceived and provided for when the dome was first built, without at all proving that the panels were actually shaped in the extremely difficult manner suggested by M. Chédanne.

Evidence of the most valuable nature as to the merits of



these various explanations of the paradox of the Pantheon could be drawn from the appearance of other buildings of like character, but the present state of knowledge of the details of the vaults from the time of Hadrian to that of Constantine is inconclusive. Only by a critical examination of these structures can the true history and chronology of panelled vault decoration be worked out. Professor Hamlin gives illustrations of a few examples of such panelled vaulting in which the work is considered to support his theories. The summary of his investigations and studies he states in the following words:—

"To sum up the conclusions which appear most rational, taking into account the present unsatisfactory character of the evidence at hand, or at least its lack of final conclusiveness, it would seem probable that the dome of the Pantheon as constructed in the time of Hadrian was internally a smooth vault, as its upper part always remained, and as many great vaults often were, *e.g.* the great vault of the Trepidarium of Diocletian's Baths, now the nave of S. Maria degli Angeli. At some date subsequent to its completion, and very probably in the time of Septimius Severus, who rebuilt the great portico of the temple, or of Caracalla, it would appear that the emperor, desiring to

was thus completed the whole was once more stuccoed, mouldings were run in the stucco of the edges of the 140 panels, the central rosettes and adornments of gilded bronze were added and the work was completed.

"The final proof or disproof of this theory must rest upon further and more minute investigation than has yet been possible, both of the Pantheon itself—to the unravelling of whose complicated history M. Chédanne has made so important a contribution—and of other vaulted structures of the Roman Imperial epoch. The Piranesi system must be finally vindicated or disproved by a more complete examination of the dome than has so far been undertaken. The brickwork of this and other monuments must be examined for technical evidence as to its having been hewn or laid up to a mould. It is to be hoped that the labours of the Italian Government, whose Direzione Generale delle Antichità watches with such zealous and intelligent guardianship over its priceless archaeological possessions, and the investigations of archaeologists and students, both Italian and foreign, to whom the Government shows such considerate hospitality, may at no distant date finally and authoritatively elucidate the paradox of the Pantheon."

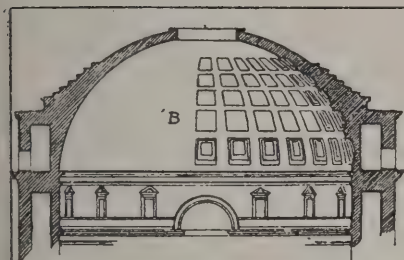


Fig. 1

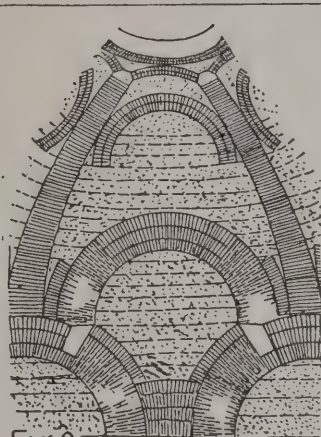


Fig. 2 After Piranesi

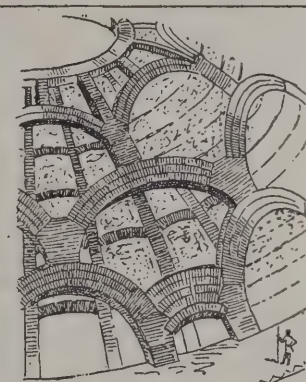


Fig. 3 After V-le-Duc

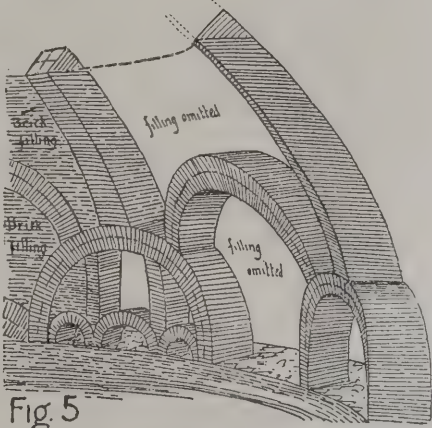
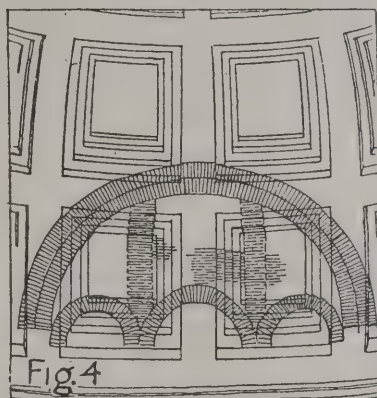


Fig. 5

embellish the dome and to replace its faded or ineffective stucco decoration with something more permanent and dignified, caused the existing panels to be hewn as a part of his work of general restoration and improvement. Owing to the difficulty and danger of working from overhead in the nearly flat central field of the dome, this work was confined to the lower three-quarters of its surface. It was a work easily executed when once the scaffolding was erected. No indications of the internal structure, discharging arches or ribs appeared upon the stuccoed surface of the dome. The designer concerned himself, therefore, with only two problems—to secure an adequate scale in his work and to arrange so that the panels should centre over the four axial niches of the building. The resultant of these two considerations was the adoption of a scale or spacing giving six panels intermediate between those centred on the axes of the building. The panels were marked out on the plastered surface and the cutting begun, the hewing away of portions of the discharging arches of the dome being a relatively unimportant incident of the work. The bevelling of the lower reveal of each sinkage of the panels was a very simple detail of the cutting, although it would have caused infinite labour and trouble to execute upon a mould as suggested by M. Chédanne. When the hewing

## ST. THOMAS, SALISBURY.

THE fifteenth-century church of St. Thomas of Canterbury, Salisbury, is in need of external repair, and a committee has been formed to raise 3,000£ for the purpose. The church, which is seated for about 1,000 people, is remarkable for its lofty choir and nave, with clerestory throughout. It has an exquisitely-panelled ceiling and fine mural paintings, while the tower is held by some to be of earlier date than the rest of the fabric. The committee have placed the work in the hands of Mr. T. G. Jackson, R.A., who has reported that the nave arcades have settled westward, and that all the columns have a slight inclination in the same direction. He proposes to remedy this by adding substantial buttresses to the west end. The tower, he finds, inclines so much to the south that the point of the spire, which is 95 feet from the ground, has moved about 2 feet 3 inches from the perpendicular axis. The roof of the south chancel aisle is in a bad state and will require reconstruction. It will also be necessary to take off and recast much of the lead on the roof. The total cost of the work he mentions would be 5,000£, and the committee have decided to proceed with the absolutely essential parts of it at a cost of 3,000£. They have already received gifts or promises amounting to over 1,000£.



## NOTES AND COMMENTS.

A RELIC of the old system of providing Paris with water is about to be removed: this is the "Pompe à feu de Chaillot," which stood near the Pont de l'Alma. In the reign of LOUIS XV. the principal sources of supply were pumps at the Pont-Neuf and the Pont Notre-Dame. In 1781 the Brothers PERIER projected an additional supply, and it was claimed that the water of the Seine could be obtained in unlimited quantities, that the luxury of baths might be enjoyed without hindrance, that fires could be extinguished and the streets watered in summer. A company was formed to carry out the arrangements, and works were constructed at Chaillot. The water was introduced into a reservoir from the Seine, and the part of the river selected was supposed to be the only one where there was an affluence of water. It was also contemplated to have other reservoirs in positions which would dominate the city. At first the enterprise was a success, at least, for the shareholders, as the price of the shares rose from 1,200 livres to 4,000. But the discontent which prevailed about the period of the Revolution was not favourable to the project. MIRABEAU found it served his purpose to oppose the PERIERS. The value of the shares fell as quickly as they had been elevated, and the unfortunate brothers were ruined and died in great poverty. Afterwards the municipal authorities of Paris undertook the scheme. Since a new supply was utilised the reservoirs have been useless, for they are not even required to fill the lakes in the Bois de Boulogne. It has therefore been resolved to remove all that remains of the works and to sell the ground, which will be, no doubt, valuable for building.

THE Camberwell School of Arts and Crafts has been reopened for a new session of usefulness. An extension of the buildings has been arranged for in order to accommodate classes in brickwork, carpentry, plumbing, stained glass, &c. The building is a memorial of Lord LEIGHTON, and the instruction is especially adapted for those engaged in building and the subsidiary arts. The school is to supplement apprenticeship rather than supplant it. The classes of architectural design and building construction are directed by Mr. A. W. JARVIS, architect. There are also classes for wood-carving, stone-carving, masonry, plasterwork, house-painting and decorating.

THE excavations at Corinth have produced interesting evidence of the former attractiveness of the city. The principal fountain was protected by a structure which was surmounted by a figure of POSEIDON with dolphins. The Romans recognised the value of the water, and surrounded it with a balustrade of coloured marbles. The large triumphal arch was likely to have been erected during the Roman dominion. Parts of two colossal figures of Phrygians have been unearthed. Two heads of women of more than life size were also found. HELIOS, or the sun god, was revered by the Corinthians, and a bust in relief shows the extended rays surrounding the head, which are not uncommon in later Greek examples. The credit for the discoveries must be ascribed to the American Archaeological Institute.

A FEW years ago there was an outcry against the rebuilding of the tower of Liskeard Church, which was considered to be dangerous by the parishioners. The work will be completed in a few weeks, and the total cost, including the hanging of the bells and the placing of stained glass in the window, amounts to 6,200*l.*, towards which 4,100*l.* was subscribed. It was alleged that the tower being Norman, a new tower in a later style would be an anomaly. It was incorrect to describe the tower as Norman. In the course of the operations, embedded in the rubble-built walls of the old tower were found the "dog-tooth" stones which formed the principal arch or entrance to the original Norman tower. These stones were thrown into the old walls at the time of rebuilding or "restoration" for filling purposes, and not treated as of any value. They have all been carefully re-formed into an interior arch on the north side of the tower, and represent a most interesting feature of early work. All the other original worked stones discovered in the old walls—evidently cast there in the same careless manner—have

been preserved and reset in position, as well as the grotesque figures or gargoyles supporting the small Norman arches near the parapet. There is now a safe tower which retains all the valuable parts contained in the old tower, and in complete accord with the grand old parish church. The vicar and churchwardens are therefore justified in appealing to lovers of ecclesiastical architecture for aid towards providing the sum of 2,100*l.* which is still required to pay the expenses.

## ILLUSTRATIONS.

## PREMIATED DESIGNS FOR PROPOSED NEW MUNICIPAL OFFICES, CREWE.

By Mr. H. T. HARE, F.R.I.B.A., Mr. A. E. DIXON, A.R.I.B.A., Messrs. BANISTER FLETCHER & SONS, Messrs. E. G. RODWAY and C. F. W. DENING.

THE following is the report of the assessors, Messrs. WOODHOUSE & WILLOUGHBY, on the forty-four sets of competitive designs submitted in the competition for the Crewe Municipal Offices, the premiated designs being published in this number:—

Mr. Mayor and Gentlemen,—In accordance with your instructions we have made a most careful and exhaustive examination of the many excellent schemes submitted for the above, and herewith beg leave to lay before you our adjudication on same. In the first place, we feel called upon to emphasise the pleasing fact that both for number and general merit the majority of schemes submitted are very exceptional, and as many able and carefully thought-out designs have been sent in, the difficulty of arriving at an equitable decision was considerably increased.

Each member of our firm has given every scheme a most careful perusal and investigation, and as a joint result of our anxious deliberations we have no hesitation in awarding the set of drawings numbered "13" the honourable position of first place. The author of this design has shown conspicuous ability in successfully dealing with the problem, both from the points of arrangement, construction and design. In every way the scheme is most meritorious and admirably adapted to the various purposes of your proposed structure, as set forth in the "Instructions to Architects," of which one of the most important (amongst many) has been faithfully fulfilled, viz. the cost.

Respecting our decision as to the awarding of second place, for which a premium of 25*l.* is provided, we experience considerable difficulty in advising you. Although many commendable schemes carefully conceived and most conscientiously developed and worked out by their authors respectively have been submitted, yet in each project are to be found many points of defect as compared with No. "13," the scheme placed first, and which can readily be seen on reference to the points of assessment previously given for your guidance.

Three schemes, however, viz. Nos. 17, 22 and 2, contain certain merit of their own either in plan or elevation, coupled with a sincere and earnest effort to faithfully solve your problem. These we have chosen as worthy of further investigation out of the thirteen selected by us in the intermediate round of elimination, and which were Nos. 2, 4, 6, 9, 13, 17, 19, 22, 26, 32, 34, 35 and 40.

After further consideration we are of opinion that the most equitable and satisfactory solution would be to bracket Nos. 17, 22 and 2 designs as equal second and make an allowance of ten guineas to each. It would be money well earned and also some little recompense for the time, labour and expense fruitlessly expended.

In conclusion, we can with the utmost confidence affirm, should your committee adopt scheme No. 13, chosen by us on their behalf, they will without doubt secure the best design submitted and one that most fully and adequately embodies their requirements taken as a whole.

Also, if the minor points of detail we have suggested be placed before the successful author, he will give them careful consideration when preparing the working drawings, and provide you with a structure in every way suitable for the several purposes intended and creditable alike to yourselves and Crewe. With the earnest hope that your Corporation may see their way to accept our assessment, which we feel certain will meet with the profession's endorsement, and sincerely thanking your borough surveyor for his courtesy and the valuable assistance he has rendered.



## DENE HOLES AT BEXLEY.\*

*(Concluded from last week.)*

A DANE by the Anglo-Saxons was called a Daene, and the plural was Dene; a den or cave was a denu, and a grave was a denn. Originally termed a denu, or denn, it seems probable that the English equivalent became a suffix to the Saxon word. In place names, as Mr. Pitt has pointed out, there are various similar instances. In the newspapers we may daily read of new novels; and by Bramshill we recently saw the sign of the Hatch Gate. It is not necessary, therefore, to regard a dene hole as the work of a Dane, though by the Danes some of them may have been used. The Adullamites of whom we read in the Book of Genesis lived in caves, and we may believe that the holy manger was a cavern in the rock. Many a gipsy child has been born in the caves near Nottingham, and Mr. Charles Wheeler, when writing of Tangleby Manor, told of the cave dwellings he had seen at Balaclava, which are still inhabited. In Sussex there are many excavations which are regarded as pit dwellings. As a rule they are close to a camp. There are some in the western slope of the Cissbury Camp, near Worthing; some are near the Trundle Camp on St. Roche's Hill, above Goodwood; by the camp on Wolstanbury Hill, near Hurstpierpoint, there is another group; at Hollingbury Castle, near Preston, there are others, and a few years back more were discovered at Lavant, near Goodwood. On Worms Heath, Chelsham, Surrey, there are various shallow pits in the gravel which are termed the Camp; no clue has been found as to their origin or use. Three caves discovered at Croydon last year are ascribed to the Neolithic age, and are regarded as having been places of refuge. The excavations in the rock by the river Leen, at Nottingham, are supposed to be the work of the ancient Britons, though now known as Papists' Holes. The Smugglers' Caves and Pipers' Holes in Cornwall, Mr. Potter regards as having originally served as habitations. The caves at Daddy Hole Plain, Torquay; the Tilly Whim Caves, near Swanage, and the many smugglers' caves along the coast, were formed by the action of the waves. Many are left high and dry; others can only be entered at low tide; while some, like the Hissing Well at Pagham, have yet to be explored when the waters recede. Norfolk and Suffolk take first rank in almost every feature that is of interest to the antiquary, and the excavations there, as stated by William White, are numbered by thousands. In most of the districts they bear a local name. On the Suffolk side of Brandon they are known as Grime's Graves; these are connected by galleries, and are regarded as the flint mines of Neolithic man. At Thorpe, near Norwich, they are termed Mouse Holes, and the open space containing them bears the name of Mousehold Heath. Aylmerston Heath is riddled with them, and there they are termed Shrieking Pits, probably from adventurous youngsters making their voices resound within them. At Beeston Regis, where they honeycomb the Heath, they are called Hills and Hollows. At Marsham Heath, Eaton, Weybourne and Edgefield they also abound. Many of them are lined with stones, and narrow trenches also lined with stones connect two or three together. These, there is little doubt, were the homes of the early Britons. In St. Clement's Caves, Hastings, it has been suggested that baptisms and other religious services may have taken place, and a like use was probably made of the cave at Royston, now being destroyed by the cold air admitted through the ventilator. In the champagne districts the wine is stored in caves; and in modern times excavations have been made in the White Rock, Hastings, for a similar purpose. The Dane Holes at East Tilbury are stated to be connected by a passage with those at Chadwell, near Little Thurrock. These are in Hangman's Wood, or rather Hanging Wood, its old name. In writing of them Morant carries down an old tradition that they are King Canobelin's gold mines. On the banks of the Somme similar excavations exist, many with passages leading to the parish churches. These are known as "Les outerrains des Guerres." The Barons' Caves at Reigate, with their long subways, the caves under Nottingham Castle, and the dungeons and other excavations under Hastings Castle formed part of the fortifications, and in the same class it seems reasonable to place the Magpie Caves at Hollingbourne. At Allericay, in Norsey Wood, near Brentwood, and elsewhere in Essex, dene holes are found. In Berkshire these hidden chalk pits exist; at Salisbury Plain they are seen, and a writer in the *Daily Graphic* mentioned some in Hertfordshire, where Mr. Harston has seen evidences of them in Tolmer's Wood. Kent chalk caves are numerous; one in Swanscombe Wood is known as Clappernabber's Hole. They are seen on Artford Heath, at Crayford, and at Aylesford, where they are regarded as sepulchral caves. They have stone slabs cover-

ing them, and are filled in with loose flints. Wright likens them to those at Etruria. Near Bexley, in addition to Stankey Wood, the holes are found in Joyden Wood and at Cavery Spring. At The Point, on Blackheath Hill, a chalk cave was discovered in 1780. It extends for nearly 130 feet, and contains four chambers connected by passages, with a well 27 feet deep in the furthest part. James Thorne described the cave as having a circular shaft like the dene holes. At Chislehurst there are numberless caves, which are termed draw-pits. In Camden Park there is a connected series of them, known as The Swallow. They were explored in 1857, and



CAVE DWELLINGS, BALACLAVA.

described by Mr. Latter, who stated they contained bones, and in some cases the entire skeleton, of the horse, pig, deer, dog and wolf, with what was believed to be the skull of the *bos longifrons*, an extinct species of the ox. Fragments of Romano-British pottery and a small piece of Samian ware were also discovered. Man in his time plays many parts, and so have caves. They have been formed by the washing of the waves and by the hand of man. They have served as habitations for families, as shelters for women in travail, and as refuges for women and children in the time of war. Warriors have made them their lurking-places, hunted felons have welcomed them as sanctuaries, prisoners have died within their walls. They have been used as places for secret meetings and for religious

\* A paper read by Mr. T. P. Wiggins before the members of the Upper Norwood Athenæum, with additional notes by Mr. W. F. Curdence and Mr. W. F. Potter.



services, and shepherds have rested in them on the hillsides while watching their flocks. Fasting anchorites have made them their cells, while for chieftains and holy men they have served as sepulchres. As silos for sweet ensilage, and as store-rooms for grain, wine and contraband goods they have been used, while some may have been merely mines for obtaining flint, marl, chalk, sand and gravel. Occasionally their uses are apparent, but more frequently opinions as to their origin can only be hypothetical.

Dene holes are first alluded to in Camden's "Britannia," where there is an account of some remarkable excavations near Tilbury, on the north side of the Thames, and which Camden supposes to be of British origin, and to have been made as granaries for corn, according to a custom of the Celtic tribes, for which he quotes Tacitus as his authority. On the other hand, Mr. Charles Roach Smith, the well-known antiquary, in a letter to the *Building News*, February 8, 1867, says:—"Camden must be in error in supposing these pits were used as granaries for corn. They are neither more nor less than chalk pits." Pliny, the naturalist, in speaking of the various kinds of earths, refers to the chalks and marls of Gaul and Britain, "marga," he says, being a Gaulish and British word. These pits were usually sunk as deep as 100 feet. There are a number of them at Billericay and Noresey Wood, near Brentwood, in Essex, and they are found on both banks of the river Thames. Other writers also took part in this subject in 1867, showing that these "pit dwellings," or "dene holes" existed in gravel and other districts. I think the word "dene" suggests its origin: it signifies a hollow or cave, and from which we derive the word "den." The word "Denmark," for instance, signifies the land of caves or hollows, and we have the "Deepdene," near Dorking. The *Daily Graphic* has published of late years, April 20, 1895, and September 23, 1898, some very interesting accounts of dene holes in Sussex, Kent and Essex, with illustrations, but it concludes its observations with the opinion that they are chalk pits, thus favouring the above suggestion of Mr. C. Roach Smith. In the illustrations or diagrams of the dene holes the *Daily Graphic* shows the plans of them in the three different counties, those in Sussex being quatrefoil in shape, those in Kent cinquefoil and those in Essex sixfoil.

In all cases they are most symmetrical in their plans, and very unlike what a chalk pit would be, which one would fancy would more resemble the plan of a coal mine. And, as has been pointed out, they have been found in other localities than in chalk districts. The "Dane John" at Canterbury is of similar derivation, though I am not sure that this has been proved to be hollow, but from this word we get the word "dungeon," which simply means an underground prison. These dens or caves abound all over the country, as the "Barons' Caves" under Reigate Castle, the St. Clement's Caves at Hastings, &c. In Cornwall they are called Smugglers' Caves, or "Pipers' Holes," and their history is so remote that I think we may be justified in calling them the prehistoric pit dwellings of our primitive ancestors. Some of the entrances to the Cornish caves are difficult. I went down one some years ago with a former member of the Upper Norwood Athenæum, Mr. John Hayward; it was called "Isa cwm pocha," whatever that may mean, and I do not know if I have spelt it correctly. The entrance to it was not only difficult, but it was difficult of description. Suppose you take a large sugar basin filled with half-inch cubes of sugar thrown loosely together, with two small flies on the top working their way down between the crevices to the bottom of the basin, then to imagine these lumps of sugar enlarged into blocks of rock about a ton weight each, or a cubic yard or two, and the two flies on top to be Mr. Hayward and myself, you will have a very faint idea of us, preceded by a pilot or guide, working our way down between the crevices of the blocks of rock for many yards deep, till we came into the famous "Smugglers' Cave" called "Isa cwm pocha."

Some do not think dene holes or caves could have been used as "pit dwellings," as we should die of rheumatism if we lived in them; but we must remember that man was more of an amphibious animal than we are now. Our monkish forefathers thought nothing of erecting their abbeys and monasteries in the most dismal swamps, and our towns were always constructed near to rivers, but now we seek the bracing air of tops of hills.

The history of caves is as old as Scripture itself, where they are frequently described. In fact, they are the beginning of architecture, as in the rock-cut caves and temples of ancient Egypt. Probably man found it necessary to seek shelter underground, not only from storms and foes, but from leviathans and species of animals which do not now exist.

Julius Cæsar\* describes the Britons, while on his march to London after the battle of Deal, being frequently attacked by them in his rear, they coming out of their woods and caves, probably the dene holes of Kent.

\* Cæsar also describes the ancient Britons as being "rovers and pirates," so they must have had some hiding-places when on shore.

## THE BODLEIAN TRICENTENARY.

ON next Wednesday and Thursday over two hundred guests from all parts of the world will meet at Oxford to celebrate the foundation of the Bodleian Library. It was said long ago by Robert Burton in his "Anatomy of Melancholy":—"How much are all we bound that are scholars to those munificent Ptolemies, bountiful Mæcenases, heroical patrons, divine spirits, that have provided for us so many well-furnished libraries as well in our public academies in most cities as in our private colleges? How shall I remember Sir Thomas Bodley among the rest?" That was a natural exclamation in a time when, without books, there was supposed to be no knowledge. Bodley himself was an opponent of the new science in the beginning of the seventeenth century, for he considered the hopes of Bacon about the future destinies of the human race to be chimerical. Afterwards he admitted that Bacon showed himself a master workman who was qualified to speak on the state of learning in those days.

It is hardly necessary to say that Oxford possessed a library two centuries before the foundation of the Bodleian. In the north-east corner of St. Mary's Church, over a dark and cavernous vault, is the site of the original University library of Oxford. This is a chamber 45 feet long and 20 feet broad. Here was begun about 1367, and finally established in 1409, the first actual library of the University, called after Thomas Cobham, Bishop of Worcester, who about 1320 (seven years before his death) set about building the room and providing for the books he had collected. Before this time, however, Wood tells us there were some books kept in chests in St. Mary's Church, which were to be lent out under pledges, as well as some chained to desks. Another precursor of the general library was the collection bequeathed to Durham College (on the site of which stands the present Trinity) in 1345 by one of its founders, the learned author of the "Philobiblion," Philip of Bury. On the dissolution of the college by Henry VIII. some of the books are said to have been transferred to the building in which Bishop Cobham's collection had by that time found a permanent and more spacious home, or rather had undergone what amounted to a new foundation. Before a score of years had passed since the completion and the opening of Cobham's library the needs of the University brought forward Duke Humphrey of Gloucester, the munificent patron of the new learning. Besides liberal gifts of money to the new divinity school then in process of erection, the duke came down with still richer contributions of books for the library. Between the years 1439 and 1446 he appears to have forwarded about 600 MSS., which were for the time deposited in chests in Cobham's Library. A catalogue of 364 of these MSS., printed from the lists preserved in the University Register, in "Documents Illustrative of Social and Academic Life at Oxford," edited by the Rev. H. Anstey, is in the series of Chronicles issued under the sanction of the Master of the Rolls. They were very varied in character. With works in divinity, philosophy and law were mingled treatises on medicine and science, together with many in lighter literature. There were no less than seven MSS. of Petrarch and three of Boccaccio. A bequest of additional MSS. contemplated by the Duke, being "all the Latyn bokes that he had," together with 100*l.* towards the completion of the "Divyne Scholes," was with difficulty procured, owing to his having died in 1447 without formally signing his will. We hear with surprise that only three out of all these MSS. are known to exist in the present library. Sundry of them appear in some mysterious way to have crept into the Harleian, Cottonian and Egerton collections now in the British Museum.

The original room at St. Mary's proving wholly insufficient to hold these additional treasures, the building of a new one was first intimated in a letter from the University to the Duke July 14, 1444. It was finally completed in 1480, and forms now the central portion of the great reading-room. The name of another liberal donor follows that of Duke Humphrey in the list of benefactors. Bishop Thomas Kempe, of London, besides largely contributing to the divinity school, sent some books in the year 1487, which, however, Wood complains, in a very few years began to disappear, being borrowed by scholars upon petty and insufficient pledges, which they chose to forfeit rather than restore the books. An imputation of this kind rests upon Polydore Virgil, who, being refused any further opportunities of abstraction, had to obtain a special license from Henry VII. for taking out any MS. Sir H. Ellis, in his preface to his edition of Virgil, attempts indeed to exculpate his author. The storm of Puritan bigotry did most, however, to disperse the gathering treasures of learning. In 1550 the Commissioners appointed under Edward VI. for reformation of the University visited the libraries in the spirit of John Knox. All MSS. ornamented with illustrations or rubricated initials were destroyed as Popish, and the rest exposed to indiscriminate injury and theft. The traditional reports of eye-witnesses handed down by Wood are abundantly confirmed by the well known descriptions of Leland and Bale as to what went on elsewhere. We hear of MSS. burned or sold to tailors for measures, and



bookbinders for covers and the like, until not one remained *in situ*. An entry in the University register completes the record of the catastrophe. On January 25, 1555-56, the vice-chancellor and proctors, with two masters of arts, one of them Mr Morwent, president of Corpus, were elected a delectio *ad vendenda subsellia librorum in publica Academia bibliotheca, ipsius Universitatis nomine*. The very shelves and stalls of Duke Humphrey's treasure were, in the name of that seat of learning, condemned for firewood.

Four years after this act of vandalism an undergraduate entered at Magdalen College who was destined thereafter to be moved by the sight of the ruin and desolation around so to reconstruct the old Plantagenet's library that the glory of the second house should eclipse by far the glory of the first. A successful student both of the classic and modern languages, and eager in the cause of learning, Thomas Bodley, on being elected a Fellow of Merton in 1563, undertook, without fee or reward, a public Greek lecture in the college hall. After some years spent in academic pursuits, Bodley betook himself to diplomatic service abroad, carrying with him still his affection for the ancient scientiarum sedes, the haunts of his earlier studies. Weary at length of statecraft and the ways of Courts, "I concluded at the last," he says in "Reliquiæ Bodleianæ," "to set up my staff at the library door in Oxon; being thoroughly persuaded that in my solitude and surcease from the commonwealth affairs I could not bring myself to better purpose than by reducing that place (which then in every part lay ruined and waste) to the public use of students." In a letter to the Vice-Chancellor, February 23, 1597-98, he offers to take upon himself the charge and cost of fitting it up with shelves and seats, of obtaining benefactions of books and of endowing it with an annual rent. Merton College found the timber. In two years the beautiful roof was put up, which is deservedly admired still. Bodley's arms are painted on the bosses dividing the panels which bear the arms of the University. The eastern wing was added in 1610, and the picture gallery in 1613-19. The original register of benefactions provided by the founder—two large volumes in vellum—is one of the curiosities of the library.

Among the first and largest donors of books in the year 1600 occur Lord Buckhurst (afterwards Earl of Dorset), the Earl of Essex, Lords Hunsdon, Montacute (patristic works), Lisle (afterwards Leicester), Lumley and William Gent, who gave a large collection of books, chiefly medical. Of the many books given about this time by Bodley himself, one was no doubt the famous copy of the French "Romance of Alexander," specially interesting for its numerous quaint illustrations of the customs, trades, amusements and dress of the time. Great use has been made of these by Strutt. The colophon shows that this work was four years in painting, and ends with the words, "Che liure fu perfaict de la enluminure au xviii<sup>e</sup> our dauryl. Per Jehan de grise, Lan de grace M.ccc.xliiij." The scribe's name is given as Thomas Plenus Amorix (Fulllove). Sir H. Savile and William Camden are registered as donors of books in the following year; but the greatest benefactor of the year was the first librarian, Dr. Thomas James, or love of whom Bodley consented to relax for once his stringent rule which till the year 1856 forbade the librarian to be married. Almost every year contains the mention of gifts from men of mark or rank. In 1603 Raleigh gives 50*l*. There seems to be some doubt as to the story of his having procured for Oxford the library of Osorius, Bishop of Faro, in Portugal, which was carried off at the capture of that place by Essex in 1598. In this year Sir R. Cotton presented, together with ten other MSS., the MS. of the Gospels, additionally believed to be one of the two copies of the old Galic version sent by Pope Gregory to Augustine in Britain, long preserved in St. Augustine's Abbey, Canterbury. The other copy is now among Archbishop Parker's MSS. in Corpus Christi Library, Cambridge. June 20, 1604, letters patent were granted by James I, styling the library by the founder's name, and licensing the University to hold lands, &c., in mortmain for its maintenance to an amount not exceeding 200 marks a year. Visiting the library in the year following, His Majesty recorded to have prosed as was his wont touching the fruits of learning, and to have uttered the mild witticism that the under's name should rather be Godly than Bodly, adding that ere he not King James he would be a University man. It seems, however, that the king's liberal offer of choice and rare books from the royal collection bore but meagre fruit. Dr. Ames's first catalogue both of printed books and MSS. was printed in this year. In 1610, by agreement with the Stationers' Company, Bodley, after "many rubs and delays," secured for his library copies of all books published by members of that body. This agreement was the precursor of the obligations secured by the Copyright Acts. An order of the Star Chamber was made July 11, 1637, confirming this grant. An ordinance of the Company was passed in 1612 for enforcing the obligation upon its members.

The permanent endowment of his library was commenced by the founder in 1611 by the purchase from Lord Norreys of

the manor of Hendons, near Maidenhead, worth annually 91*l*. 10*s*., to which he added certain tenements in Distaff Lane, London, yielding a rent of 40*l*.

Dying on January 28, 1613, Bodley was buried, by his desire, in the chapel of his college, with much state, and bewailed in two volumes of elegiac verse, among others by Laud in Latin, and Isaac Casaubon in Greek. One volume was entitled "Bodleiomnema," and the other "Justa Funebria Ptolemæi Oxoniensis." The bulk of his fortune, 7,000*l*. it was said, was bequeathed by him for the building of the east wing of the library and the completion of the schools. But it fell miserably short, "by reason of the fraud of his executor, the loan of a great sum of money to Charles I. in his distress, and by the fire of London," the tenements in Distaff Lane having no doubt been burnt. A curious present had been promised by Bodley of a cloak of "Tartar lambs' wool," sent to Sir Richard Lee by the Emperor of Muscovy. This singular garment was, after some time, recovered from Bodley's executors. Tradescant's first catalogue of the Ashmolean Museum mentions "a coat lyned with Agnus Scythicus," but it is not now to be traced. Agnus Scythicus is simply the woolly fungus-like growth of a large fern common in Tartary, which bears some resemblance to a full-grown lamb poised on the top of a vegetable stalk. In 1629 the valuable Barocci collection of Greek MSS. in 242 volumes, purchased by William Herbert, Earl of Pembroke, Chancellor of the University, was presented by that nobleman to the library. Some supplementary volumes kept back by the Earl were bought and presented by Cromwell. The gift of Sir Kenelm Digby in 1634 of 238 MSS., including the works of Roger Bacon, Grostete, Reade, Eschynen and others, was of immense value, chiefly as bearing upon the early history of science in England. Laud's great collection, consisting of nearly 1,300 MSS. in divers languages, forms a series of priceless treasures, pre-eminent among which are the famous "Codex Laudianus" of the Acts, in parallel columns of Greek and Latin, set down by Mr. Coxe and Dr. Tischendorf as written towards the end of the seventh century. Another famous MS. is a copy of the Saxon Chronicle, ending A.D. 1154, probably from the abbey of Peterborough. There is also a curious Irish MS. containing the Psalter of Cashel, Cormac's Glossary and the poems of SS. Columbkil and Patrick.

The known value of the library, even in a money point of view, by this time began to put it in jeopardy. A London newsletter of April 2, 1649, informs us that "the Jews proffer 600,000*l*. for Paul's and Oxford Library, and may have them for 200,000*l*. more." Happily, the rapacity of the Council of War running the figure up too high, this neat stroke of commercial business fell short of the mark. Selden's splendid bequest added no less than 8,000 volumes, nearly all bearing his well-known motto. The mere bringing the books from London cost 84*l*., and the providing chains for them, as stipulated by the executors, 25*l*. 10*s*. Of the wealth of this collection in classics and science, theology and history, and above all, in Biblical and Talmudical literature, it is impossible to give any idea. Other additions were of vast, though lesser, importance. Colonel Vernon's wonderful collection of early English poetry, the "Ormulum" and "Cædmon" of Francis Junius, the Oriental books and MSS. of Thomas Graves, and the still more precious accumulations of Pococke and Ussher, swelled year by year the riches of their several departments. The name of John Locke appears in the Register, A.D. 1704, as the donor of his own works, honourably coupled with those of Stillingfleet in reply. The Tanner MSS. in 1736 formed a bequest of inexhaustible service to antiquarians. The Clarendon series, so productive to the University exchequer as well as invaluable to the study of the Civil War, came into the possession of the library in 1753, through the bequest of Henry Hyde, Lord Cornbury, great-grandson of the Chancellor. In point of variety and bulk, no benefaction since the time of Bodley, Laud and Selden came up to that of Rawlinson, the nonjuring bishop. His only rivals since his day have been Gough and Douce. The largest sum ever voted for the purchase of works was 5,444*l*. paid in 1817 for the great collection of the Jesuit Canonici of Venice. The MSS. alone amounted to 2,045. Among them were fifteen MSS. of Dante, the first of that author which the library possessed. Malone's rich collection of English dramatic literature and poetry came in in 1821. But to enumerate fairly even the choice and exceptional treasures with which this wondrous storehouse of learning and intellect has been gradually filled during three centuries and a half would be to transcribe bodily from almost every page of its annals.

Messrs. Peter Bisset & Son, of North Street, Aberdeen, have obtained the contract for the erecting of the new post-office at Aberdeen. The amount of the contract, which includes everything but the tilework, woodwork, flooring and electric lighting of the building, is between 40,000*l*. and 50,000*l*.



## CLAY-WORKING INDUSTRIES OF GREECE.

THE American consul at Athens says that the modern pottery of Greece is principally of two kinds, viz. ordinary cheap crockery ware for common or general use, and fine ceramic pottery, artistically made and finished by men who have studied the art at the Polytechnicum, and who model their work after the celebrated ancient pottery of Greece, imitating the shape, colours, finish, &c. Some of these clay-workers become very proficient, and make fine imitations of many of the ancient styles. In the preparation of the clay for pottery, brick or tile the Greeks sometimes mix it by hand, but often in a simply constructed clay mixer, turned by horse-power. The ordinary or common pottery is very cheap, and is used for all kinds of culinary and household purposes. Jars, jugs, vases, bowls, basins, pots, &c., of a reddish colour, and usually unglazed on the outside, but glazed within, are in general use, and can be bought at very low prices. In many places, but especially on the island of Ægina, a cream-coloured water-jug or jar is made, which is so porous that when filled with water the moisture keeps continually exuding to the outside and there evaporating, which wonderfully cools the contents, especially when the vessel stands in the air. These cheap "water coolers" are used by everyone, rich and poor, and great numbers of them are manufactured and sold every year. These jars are very cheap, but friable. Many thousand jugs of the red ware are continually in use for carrying and holding water. Pottery manufactories are very numerous in Greece. In Athens there are a dozen or more, the most noted of which are in the "Keramikos" (clay workers') quarter in the western portion of the city, and on the "Sacred Way" of the ancients. They turn out many kinds of crockery, and some very good imitations of ancient vases, &c. In the Cyclades, and in all the islands of the Ægean Sea, there are pottery manufactories, and the pottery of each island has certain characteristics peculiar to itself, owing to the difference in the clay, or the method used in its manufacture. Roofing tiles are manufactured in immense numbers in Greece. In and near the cities and large villages there is scarcely any other kind of roof in existence, but in the mountain villages some of the roofs are covered with flat stones or slabs of stone. Tiles are manufactured in or near every city or town of any size in the kingdom, suitable clay for the purpose being plentiful and widely distributed. The tiles are made by hand, the only machinery used being a simple and primitive "mixer," turned by a horse or mule, which mixes the clay in a pit in the ground. With the exception of those situated in and near Athens, the outfit of the Grecian tile manufactories is neither elaborate nor costly. A tile manufacturer of the smaller towns can often carry his entire plant on the backs of two or three donkeys, and thus move from village to village where there is a demand for tiles. Drain tiles and chimney tiles are made in considerable quantities. Nearly all the chimneys on dwellings in Greece are simply tiles built into the walls of the building, and extending to 3 feet above the roof. Ventilators are made in the same way. With the exception of those producing marble, of which there are many good varieties, magnesite or other minerals, the mountains of Greece are principally limestone. Very few cities or villages of the kingdom are far from a limestone quarry, and the houses are frequently built of this material, many of the best buildings being faced or ornamented with marble. Most of the houses, however, are built of stone and stuccoed on the outside—and often on the inside—and painted in good imitation of marble. This stucco lasts many years on the exterior of buildings in Greece, where frost is seldom seen, and is cheaper than marble. In some country villages, where the quarries are very far away or the roads are bad, houses are often built of sun-dried brick, but in parts of northern Greece, especially in the small villages of Thessaly, houses are built by first erecting a frame of willow poles and rods, and then covering this wickerwork with a coating of mud or clay mortar. Sun-dried bricks are used in considerable quantities. The humbler houses in the suburbs of the cities of Athens, Piræus and Patras, and in many villages where stone is not plentiful or easy of access, are built of sun-dried bricks. In fact in some villages the houses are nearly all built of this material. Many fences or walls throughout the country are composed of blocks of clay one yard square and half a yard thick, made in a manner somewhat similar to the manufacture of sun-dried bricks. The bricks, as the name implies, are dried by the heat of the sun only. They vary in colour according to the colour of the clay used, and measure about 12 by 6 by 2½ inches. These bricks are made in every village, town and farm in Greece that has clay, and there are few places in the kingdom that have no clay deposits. Kiln-dried or burned bricks are manufactured in or near Athens, Volo, Chalkis, Pyrgos and elsewhere in Greece; they are of a hard quality and usually of a very light cream colour. It is said that no soft kiln-burned bricks are made. Kiln-burned bricks are used for the erection of chimneys in factories, foundries, &c., partitions in buildings, bakers' ovens and furnaces, and sometimes for building drains and sewers. Iron chimneys or "smoke stacks" are seldom

erected. On account of the limited use of kiln-burned bricks in Greece the manufactories of this material are few. There are but four or five of importance, and even these do not make bricks exclusively—they also manufacture tiles. Like the sun-dried, the kiln-burned bricks are made by hand, the only machinery used being the simple "mixer" propelled by horse-power. One man can mould 3,000 bricks each day. After the bricks are moulded they are allowed to be in the sun until partially dried, and stiff enough to handle easily. They are then built up in an "open work" manner, so that the heat from the fire can heat each brick. The fuel used is nearly always wood, and the fire, never very hot, is kept up for about fifteen days.

## ZIMBABWE RUINS.

THE secret of the ancient ruins of Zimbabwe, with its acropolis, temple and forts, has not yet been laid bare. It is still uncertain to whom we owe these mysterious structures and at what date they were erected. A very good case has been made out for identifying Zimbabwe as the Havilah of the Old Testament, and for supposing that Phœnicians or descendants of Phœnicians had a hand in its erection. One thing is certain, that the buildings are not the work of any of the present natives of South Africa, although they may have been used over and over again by local tribes. Native implements found in the ruins prove this. Perhaps the greatest puzzle is the *raison d'être* of the situation of the ruins. The acropolis is situated on a kopje 250 feet high in a plain surrounded by hills, and affording an extensive view along several valleys. The temple is situated in this plain, and down one of the valleys there is a long chain of forts striking eastward as if making towards the coast. The curious part is that there are in the immediate vicinity none of the ancient gold workings which abound all over South Rhodesia, and there still exists the unsolved problem of the situation of Zimbabwe.

Perhaps in the near future the truth may be disclosed. The Government of South Rhodesia, says the *Scotsman*, have taken a very important step for the preservation of the ancient ruins. They have appointed Mr. R. N. Hall, who is joint-author with Mr. Neal of "The Ancient Ruins of Rhodesia," as temporary curator at Zimbabwe. It is to be his work to clear away all rubbish and vegetation that tends to conceal or to destroy the buildings. Mr. Hall arrived at his station on May 23 and already a great amount of work has been done. The walls enclosing passages which wind round and up the kopje to the enclosures on the top have been laid bare, and passages have been disclosed which were not previously thought of. Two of these passages, 20 and 30 feet long respectively, and between walls 8 feet high, were so concealed with rubbish that the visitor's path crossed right over them. Two large ancient entrances have also been discovered. They had been used by the native Makalangas for graves. Other architectural discoveries are a wall with dentelle pattern, a cement-lined enclosure and three wedge-shaped buttresses. The buttresses are of peculiar interest, being the first discovered in Rhodesia. Naturally, in the rubbish cleared away many "finds" have been made. These include the characteristic soapstone birds, beams and bowls. The birds are decorated in the usual fashion, and the beams and bowls show chevron and cord patterns and sometimes figures of animals. Pottery and iron tools have been discovered, but whether they are of very ancient date it is impossible to say. At any rate they are not such as are used by natives of the present day. Perhaps the most valuable discovery is a gold bangle of wirework, weighing 3½ ozs., and a beaten gold cap or ferrule.

Although the acropolis, with its winding walls of granite blocks, its monoliths and chambers, is the most imposing ruin the more interesting ruin and the one in which more "finds" are likely to be made is the temple in the plain below. A few months ago the interior of the elliptical temple was an impenetrable jungle of trees, bushes, tall grass and creepers. The monkey-ropes and the wild vine have committed great depredations, and the last remnant of the herring-bone pattern on the wall was fast disappearing. Mr. Hall's arrival was very timely. With the help of fifteen natives he has cleared away all the undergrowth and stumps, and now for the first time an uninterrupted view of the whole structure can be obtained. The most striking object is the large conical tower about 15 feet high, which is suggestive of the old Phallic worship. This cone has suffered somewhat from the growth of trees and is now slightly tilted. The architectural discoveries made in the temple are four ancient drains, a double-curved rounded entrance, three sets of stone steps, and several yards of ancient cement flooring. The cement flooring is not original with the building. There has also been made clear a large portion of architecture which is of later date than the original building but built on the top of an original wall. The finds in the temple are similar to those on the acropolis. Altogether 2 monoliths have been found. Among the soapstone ornament



is a section of an ancient soapstone bowl believed to be the missing portion of a large bowl lent by Mr. Rhodes to the Cape Town Museum. A collection of curious stones, foreign to the district and of odd natural shapes, was also found.

The work undertaken by Mr. Hall is purely that of clearing away the rubbish and making known the nature of the structures. No excavations are being made, so there is still plenty of scope for discovery. It is impossible to imagine that the Government mean to retain Mr. Hall only temporarily. The excellent work he has done insures his being entrusted with further research. There are so many old ruins in South Rhodesia that it will take years to investigate the whole of them. Mr. Hall has not been unmindful of visitors, and direction posts have been erected everywhere either to direct people to particular ruins or to indicate the particular nature of the chambers or enclosures. Zimbabwe is three hours' journey in a Cape cart from Victoria in the south of South Rhodesia. Victoria is reached by coach now from Gwelo, which in a very short time will be connected with Bulawayo by rail. Doubtless tourists in making the grand tour of South Africa through Kimberley and Bulawayo to the Victoria Falls will take the opportunity on their return journey to make a deviation to the unique ruins of Zimbabwe. It is to be noted that Victoria and Victoria Falls are not to be confused. They are several hundred miles apart.

### PEVENSEY AND JAMES I.

THE little village of Pevensey stands, a long row of cottages flanked by a stately church, which far outstrips parochial requirements, on the flats of Sussex, a few miles from Eastbourne, where the Downs terminate, and about a mile distant from the sea. The village like many another in rural England, says a correspondent of the *Scotsman*, seems to have changed little since Tudor times, which are recalled by the Tudor rose still lurking on several lintels, and by a few old houses of woodwork, which show that their construction came before the command had issued:—

England, build houses of lime and stone,  
For after wars ye shall have none.

So unimportant is the existing village that it has no mention in "Chambers's Encyclopædia," no exclusive pages. Yet the place was one of the chief towns in Britain at a time when there were no towns in Scotland at all; it minted money for Norman kings, and for centuries was a fortress, chiefly under royal keeping. In this capacity it was for a time the prison house of James I., whose romantic life and tragic end would be interesting, even if he had not been a charming poet in the dawn of Scottish literature, and a statesman who fostered commerce and maintained law in days when trade and legality were alike unfamiliar in Scotland. "The best of all the tuarts, a strong man who in short time did the country much 'sting 'good. I wish we knew more of him." So he was characterised by an old Scottish lawyer to the writer many years ago. Scottish readers perhaps may yet find interest in this short episode of his life.

Pevensey in Roman times was one of the great towns on the south coast of England; even now it is the most perfect relic of a Roman city on our island, probably the most perfect north of Treves.

The site was chosen because it lay on flat land and was open to the sea. In those days, and apparently until the time of Elizabeth, the sea washed the southern side of the town, creating the port of Pevensey; it has now receded more than a mile, as currents, meeting from east and west, have thrown up a bank of pebbles and sand, which now forms a portion of the land surface. To the north of the flat land lay the great forest of Anderida, the Weald of Kent, Sussex and Surrey. Twenty miles in length, twenty-five in breadth, its primeval sides might well have concealed an army of Britons, such as, rising from similar covering, well-nigh cut off the seventh legion of Cæsar in his famous expedition of discovery. The walls, towers and gates with which the Romans surrounded their city—perhaps named Anderida, although Cichester also claims the name—had nothing to fear from the attack of any British host. They were built so well that the gates and one tower and the whole circuit of the northern wall are standing to-day. Their meaning is plain—they formed a fenced city in a land of danger, the open plain guarded against surprise, the walls were defensible and impregnable, in case of siege the sea was open and the friendly shores of France at hand. The shape of the city is an oval, with good towers at either end and on each flank; in other words, it is a Roman camp, which grew in time into a fortress city, peopled by more or less peaceful inhabitants. A curious parallel to Roman Pevensey may be seen in the old city of Aosta, which stands high up in the valley of the Dora Baltea, at the point where the road leaves the river and strikes northward for the Pass of Great St. Bernard. The name Aosta is derived from

Augustus, who in B.C. 24 established a colony of veterans to keep the mountain marauders in check and the pass open to commerce. The camp chosen by the troops is still unaltered; the gates, the streets, parallel or at right angles to each other, and the market-place of Aosta still retain the outlines laid down by the pennons of the Roman camp-makers. The streets of Roman Pevensey are now beneath the turf, and cattle browse over the dwellings where the stout centurion swaggered of old to the enslaved Briton, or played with the children, to whom, as epitaphs reveal, he expressed himself with unexpected tenderness. Probably, on the recall of the legionaries in 409 A.D., some at least took ship at the port of Pevensey; the place therefore has its share in closing a period of our history; it is among the last spots on our island where the Roman eagles floated on the air.

Six centuries had passed ere another structure arose within the Roman precincts. William the Conqueror landed on the low shore of Pevensey. The spot is now a green meadow where he stumbled on the slippery pebbles, but encouraged his followers by exclaiming as he rose:—

Seigneurs, par la resplendeur de Dieu,  
La terre j'ai à deux mains saisie;  
Toute est notre, quant il y a.

A low line of hills marks the route of his advance to Battle, about 8 miles distant, the scene of his victory. To commemorate his landing a Norman castle was built upon the shore, inside the Roman walls, which were to some extent refortified. It was a royal castle, which only ceased to be a fortress in the reign of Henry VII, when the general use of cannon made such defences of little value, and only passed out of royal hands after the Revolution of 1688. There is still standing outside the walls a piece of ordnance, a conscientious antiquary would style it a demi-culverin, marked with the Tudor rose and crown, and the initials E.R. It was placed there in 1587 when there was a just fear of Spanish invasion.

The wandering Scot must often be struck by a contrast between the Mediæval castles of his own country and those of "our auld enemies," but present friends, of England. The contrast is in favour of his own country, else perhaps it would not be so easily observed. It is this:—The Norman castles of England were raised in a conquered country to keep down the inhabitants. The old castles of Scotland were raised in self-defence, to protect and not to devastate. Bodiam, in Sussex, is a terrible fortress, keeping open the road to France. Orford, in Suffolk, has a windowless dungeon, as perfect now as in the days of Stephen, when it was filled over and over with the hapless peasants of the district round. Rochester predominates over the Thames mouth, as Windsor does over the Thames valley, Northampton Castle over the Midlands. Ludlow Castle was manifestly made for the headquarters of an army; indeed, its possession by the Yorkist house turned the tide of war in their favour. So Pevensey was a garrison castle, and probably maintained several hundred mounted men. How they were employed, at least in the twelfth century, it is perhaps "better only guessing." Our Scottish castles, Lauder, Craigmillar, Borthwick, Seton, have nothing of this character. They were defensible against an enemy, but there is no visible mark of their having been garrisons of oppression so much as fortresses from which, when the owner issued "in effier of war," the neighbours, sworn to be his men, flocked to his standard.

In the year 1402 David, Duke of Rothesay, died suddenly in Falkland Castle. It was believed then, as it is believed now except by those who draw their historical knowledge from romance, that the Duke of Albany and the Earl of Douglas, the two most powerful men in Scotland, were both cognisant of his death. Scotland was unsafe for the heir to the throne, and in 1405 James, the only surviving son of the king, a young boy of thirteen years, set sail for France, to be educated there in safety. Off Flamborough Head his vessel was captured by an English cruiser; the prince was made prisoner, and delivered to King Henry IV. It was a time of truce, but Henry was a politic monarch; to the request that his prisoner should be allowed to pursue his voyage he replied that he could speak French as well as his brother of France, and was equally qualified to give a good education to the King of Scotland. The act has the appearance of being an open and flagrant outrage, committed with the plain object of holding Scotland in check by the detention of a hostage of prominent rank.

The prince, a prisoner and exile for nineteen years, had many wanderings. He was in the Tower, no good omen, at Nottingham for some years, at Windsor and at Pevensey. His stay at Pevensey was not long, but is still remembered. The old cicerone of the ruins—now in the possession of the Duke of Devonshire—still with the tenacity of local tradition points out the position of what he names the "royal apartments." They are in the first storey of a round tower, which stands apart from the main buildings of the castle, forming a portion of the outer wall. Floor and roof are gone, but the holes in the walls where beams were fixed mark the low height of the chambers, and



the windows remain, looking towards plain and forest on one side, and the castle garden on the other. It is a quiet place for study, with abundant opportunities for manly sports. The neighbouring forest 500 years ago still nursed the red deer and the boar, and the wolf perhaps had not wholly disappeared. Many jawbones of the wolf were found in the castle well when it was cleansed in recent years, and the writer rummaging an old kitchen midden in the rear of the royal apartments found the tusk of a boar along with oyster shells, if the reader loves particularity. "Sanglier à huitres" sounds appetising and fit to form a royal dinner.

The young king is best known, except perhaps to the Scottish lawyer, as the author of "The King's Quhair," quire that is, or book, in which he tells the story of his love for Margaret Beaufort, the lady of the Lancastrian house whom he afterwards married. He writes as an admirer and imitator of Chaucer the great poet, who had just passed away. James was about nineteen years of age when he was a prisoner at Pevensey.

No one who has read "The King's Quhair" forgets the scene where the writer, looking out from his tower, beheld his love walking in the garden, and was at once enthralled by her beauty.

And therewith kest I down myn eye agayne,  
Quhare as I saw walking under the towre  
Full secretly, now cumyn her to pleyne  
The fairest of the freschest younge floure  
That ever I sawe, methought, before that houre,  
For quich sodayne abate (surprise), anon astert  
The blude of all may body to my hert.

The words may possibly refer to no actual locality, but simply be a poetical reflection of the scene in Chaucer, where Palamon and Arcite both descry the fair Emily from the window of their prison. Windsor also was a probable place to meet Lady Margaret, and Sir James Ramsay may be right in asserting that the words just quoted refer to the first sight of his future bride "at Windsor." Still, no words could more accurately describe the scene of the "royal apartments" at Pevensey, and the view now—and undoubtedly for long time—visible from their windows; so that a visitor may well be pardoned if he imagines that the walls of Pevensey were at least not quite absent from his mind when he penned his description of this beautiful hour of his life; and, moreover, that the peaceful scene of the long village street, the farms and hedgeless meadows with cattle grazing for miles, almost untended, was not without its share in giving definite shape to the royal resolution that, if he came to his own, he would "gar the rushbush keep the cow."

## TESSERÆ.

### Giotto's Transitional Period.

IN the art of Giotto and the Giottoesques the transformation of sculpture and painting is fulfilled. It is an art lit up with the spirit of St. Francis, warm with Christian love, pure with Christian purity, simple with Christian humility; it is the fit language of a pious race endowed with an exquisite instinct of the expressiveness of form as form, but untrained as yet in the knowledge of the concrete facts of the outer world; an art fresh with the dew and tenderness of youth, and yet showing, together with this virginal quality of young life, a simple forcefulness prophetic of the power of its riper day. Within the outline of these general characteristics individuality found sufficient scope. Awe of the doom of the wicked, and a sense of inexorable retribution, inspired in minds of a certain stamp works full of a Dantesque severity and force; to others militant Christianity and theological allegory furnished a grateful field. Local peculiarities of temperament were reflected in local artistic production. In the work of the Florentines we trace that grave sobriety which so strongly marked them in the early days of their Republican freedom, and of which, later on, Angiolo Pandolfini was to draw an interesting picture. Among the Siennese, on the other hand, the love of luxury and splendour peculiar to them translated itself in the gay profusion of gold adornments, which in their pictures bespangled and enriched the gorgeous raiment of their virgins, saints and angels.

### Flaxman's "Shield of Achilles."

In 1818 John Flaxman, R.A., received a commission from Messrs. Rundell & Bridge, the silversmiths, for a model of the "Shield of Achilles" as described by Homer. "The poet's intention," says Pope, "was no less than to draw the picture of the whole world in the compass of this shield. We first see the universe in general; the heavens are spread, the stars are hung, the earth is stretched forth, the seas are poured round. We next see the world in a nearer and more particular view; the cities delightful in peace or formidable in war; the labours of the country and the fruit of those labours in the harvest and

in the vintage; the pastoral life in its pleasures and in its dangers; in a word, all the occupations, all the ambitions and all the diversions of mankind." In the distribution of the various scenes and probable measurement of the shield Pope followed Boivin, who laid the whole down to scale with mathematical precision; his love, however, of defined lines and want of sympathy with true art have made his memorable buckler look like a chariot wheel, with the twelve scenes painted and hung between the spokes. There are circles to the amount of nine, or more, with numerous intersections, which injure the general harmony of the workmanship. The size was settled and also the shape—there is sufficient evidence that the shield was circular, and if the buckler of Hector, which in the Sixth Iliad reaches from shoulder to ankle, be taken as a scale, that of Achilles could not be less than 4 feet in diameter. Flaxman has selected from Pope all that is in accordance with his art, and interpreted the rest for himself. He has lessened the diameter to 3 feet, dismissed one-half of the circles of Boivin, and the lines of intersection, intended by the Frenchman as divisions to the twelve scenes, are changed for faint and waving lines, which divide the groups sufficiently without offending the eye. Round the border of the shield he first wrought the sea, in breadth about three fingers; wave follows wave in quiet undulation; he knew that a boisterous ocean would disturb the repose and harmony of the rest of the work. Or the central boss he has represented Apollo, or the sun, in his chariot—the horses seem starting forward and the god bursting out in beauty to give light to the universe around him. The circle, of which Apollo is the centre, is in diameter little more than a foot, yet in this space he has pictured "The earth, the heaven, the sea, the sun that rests not, and the moon full-orbed. There also all the stars, which round about as with a radiant frontlet bind the skies; the Pleiads and the Hyads, and the might of huge Orion, with him Ursa called, known also by his popular name, the Wain." On the twelve celebrated scenes which fill that space in the shield between the ocean border and the general representation of the universe, he exhausted all his learning and expended all his strength. The figures are generally about 6 inches high, and vary in relief from the smallest visible swell to half an inch. There is a convexity of 6 inches from the plane, and the whole contains upwards of a hundred human figures. Of this magnificent work the artist was justly proud; he was paid 620*l.* for the drawings and model. The first cast, in silver gilt, price 2,000 guineas, was placed by the king on his sideboard; the second, of the same material and value, was presented by the king to the Duke of York; a third, of the same metal, was made for Lord Lonsdale, and a fourth for the Duke of Northumberland. Two casts in bronze were made by the proprietors for themselves, and three in plaster were prepared for the Royal Academy, for Sir Thomas Lawrence and for Flaxman himself. The shield of Achilles is one of the worthiest of all Flaxman's works; the very way in which he made it was peculiar—he modelled it roughly in clay, had it cast into plaster of Paris, and then finished it for the silver moulder. It was in this way that he made his chief works—one could work so felicitously in plaster as himself; it carried a softness and a beauty from his touch which it could derive from no other hand. Of the twelve wondrous scenes which adorn the shield there is not one which is not replete with beauty of its own. All is moving and breathing—there is the gentleness of peace, the tumult of war and the charm wedded love.

### Connoisseurship.

The real connoisseur is a character almost as rare as estimable as the affected connoisseur is common and ridiculous; but as there is no counterfeit of less value than the latter, so there is none more easily detected; the eye of taste discovers him at the first glance; and it would be no disadvantage to society if in all cases the impostor were to be exposed on the spot, as bad coin is sometimes nailed to the counter at which it has been fraudulently uttered. The true connoisseur is a man of sense and sensibility, led by the love of nature to the contemplation of art; superior to common cat and vulgar prejudice; his feelings are alive to merit, ancient or modern, living or dead. Having formed to himself a standard of reference, the result of attentive observation, accurate comparison and mature reflection, he can measure merit without consulting the critical scale of reputation; he can give his opinion of a picture without first inquiring the painter's name, and has even the courage and the kindness to distinguish contemporary talent, though unsanctioned by time or authority. The affected connoisseur, on the other hand, is the dupe of delusion, the creature of caprice; his code of criticism is a catalogue raisonné; he talks in technicals like a parrot, and takes a picture-dealer as his oracle of art; he judges of nature by pictures, and sees the model only in the imitation, having no criterion of judgment but that which is derived from the "whistling of a name" or the whisperings of an auction-room; he is unable to discriminate, and blames and



praises by the lump; borne down by the bulk of reputation, he has no test by which to assay its real purity, and separate the metal from the dross; conscious of his incapacity, he never hazards approbation but on the back of authority, and therefore sacrifices without mercy or remorse the claims of his contemporaries to the security of his own judgment, and covers his ignorance and insensibility of the merits around him with a cloak of affected and indiscriminate contempt. But the name of a great master is a passport through all the outposts of criticism; Raphael, Titian, Rubens, Correggio are sounds with which all the beauties of art are associated. The question is not so much the excellence as the authenticity of the work; the latter established, the former follows of course, and the contented enthusiast forgets in the fervour of his zeal that the greatest genius proceeds at first in ignorance and rises late from mediocrity; forgets that the accomplished master he admires was once an unskilful scholar, and often bestows on the abortive efforts of his inexperience that applause which should be reserved for the best productions of his maturity.

#### The Plan of the Abbey of St. Gall.

The famous monastic plan preserved in the Benedictine Abbey of St. Gall is not only the oldest architectural working drawing left to us, but a precise and authentic record of the manner of building in the ninth century, and in some ways more valuable than if it depicted a particular set of existing buildings, for it shows the ideal at which the enlightened builders of that day were aiming. It is a drawing on parchment, 2½ feet by 3½, dated 820, and sent to Gozpert, abbot of St. Gall at that time, by some friend who is not identified, for guidance or suggestion in the rebuilding of his monastery, which was then to be undertaken. Carefully and minutely drawn, it shows with much detail the arrangement of the buildings of a great monastery—the central church surrounded by cloisters, chapels, dormitories, refectories, assembly-rooms, kitchens, breweries, store-houses, wine-cellar, workshops, infirmary, dwellings for the abbot and for visitors, kitchen-garden, orchard—all that was needed by a numerous, active and well-to-do community, isolated and sufficient to itself. The church is a large basilica essentially of the Latin type, as we might expect, but with some modifications which show what congregations of monks were beginning to do even so early in the Carolingian period. It is some 200 feet long, with a nave 30 feet wide divided from the aisles by arches borne on columns and intended for a wooden roof; the only vaulting indicated is in the crypt under the choir. The transept is as wide as the nave, which is prolonged through and beyond the transept in an eastern arm, and the transept arms are parted off into side chapels for special services, making a defined crossing. There are both an eastern and western apse—a German characteristic that we see in the great churches of Fulda, Trier, Mainz, Worms, Laach and many others, which has been a puzzle to archaeologists—one great altar being here dedicated to St. Peter and the other to St. Paul. There are no less than fifteen altars in the church, the aisles even being divided into something like separate chapels by screens against which altars are set. Near the western apse, but standing apart from it in Italian fashion, are two round towers, which according to the inscription were accessible by winding stairs for overlooking the universe, towers not unnecessary for watching or defence, and connected with the church by galleries or bridges. We are entitled to believe that this plan, revised for an important occasion by some one who was evidently skilled in building, records the latest ideas of that progressive time.

#### Pisa and Durham.

One of the Pisan chronicles assigns the beginning of the metropolitan church to the year 1063. Another chronicle, also the great collection of Muratori, places the date twenty-six years later. To a Northern inquirer the difference is of no great consequence. In either case the building is contemporary with Durham; if we accept the earlier date it is also contemporary with Edward's work at Westminster and with Eldwine's work at Jarrow. In the history of art the difference made by a few years between Jarrow and Durham bridges over one of the greatest gaps on record. But, after all, Jarrow is a rude specimen of the style of which Pisa is the noblest monument, while Durham is the equal rival of Pisa in a distinct style. As a group, the buildings of Pisa are probably unrivalled in the world. Nothing can be more unlike the usual way in which the great churches of continental cities are crowded and jostled than the inferior buildings than the broad space which holds the four great ecclesiastical structures of Pisa. The duomo, the baptistery, the campanile and the campo santo all stand close together, apart from all other buildings, except the wall of the city itself, in a corner of whose circuit the wonderful group is placed. But it is hardly more unlike the position of these Italian churches—Venice, of course, being the crowning example of all—in which an attempt has been made to give effect to the building by making the front look out on a wide

open piazza. At Venice, indeed, St. Mark's is a mere appendage to the secular buildings of the commonwealth; it is the prytaneion which hallowed the home of its rulers. But even where the duomo or other great church stands more independently than it does at Venice there is not often the same air of an ecclesiastical quarter which there is at Pisa. But though there is at Pisa a distinct ecclesiastical quarter, its feeling is as unlike as possible to that of an English cathedral close. In England the close is commonly something cut off from the city; in some cases the city itself is simply something which has grown up outside the close. At Pisa, though we are in an ecclesiastical quarter of the city, we still feel that we are within the city, that the great church and its satellites were the work and the possession of its citizens, and not the separate domain of an ecclesiastical prince. So unusual a site was, beyond doubt, chosen advisedly. The metropolitan church was built on ground which had been occupied by a humbler church of St. Reparata; the original cathedral must therefore have stood on some other spot, most likely, as in most other cases, in the heart of the city.

#### Thorvaldsen and his Countrymen.

No artist of the nineteenth century has been more famous than Albert Thorvaldsen. In comparison with his celebrity, that of Turner, for instance, was perfect obscurity. This Thorvaldsen went from Copenhagen to Rome, and was received in every city with public hospitality and rejoicing. If he passed near a court the king invited him to his palace; if he passed near a seat of learning or the fine arts, deputations of savants or artists saluted him with flattery so unmeasured that the wonder is how he could endure to listen to it. But he seems to have taken all this very easily, and on the whole to have rather enjoyed it, though without much flutter of vanity. It would have turned the brain of any man of Southern race, but Thorvaldsen, thanks to his tough Northern organisation, bore it without any dangerous excitement. The most curious fact about it is, when we think of it, that this man was a sculptor, and that even of the cultivated classes not one person in fifty knows anything whatever about sculpture, or can tell first-rate from fifth-rate work when he sees it; and if we reflect further that a whole nation went mad about Thorvaldsen, we may be sure that the proportion of his adorers who adored on critical grounds must have been quite infinitesimally small, perhaps one in 500. Human nature is a curious study in many ways, and few of its peculiarities are more astonishing than its capacity for feeling intense enthusiasm about things of which it is absolutely ignorant, and will not take the trouble to inform itself. The enthusiasm of all these Danes about Thorvaldsen was strong enough to make them shout and sing and drag his carriage through the streets of Copenhagen, but it was not enough to make them study art and ascertain for themselves the merits of the artist. All this they found it easier to take for granted, and the faith which takes things for granted was never more vigorously manifested. We understand more easily a national madness about a soldier, or a ruler, or a religious teacher; but to see a little Northern people, usually remarkable for soberness and practical sense, going almost out of its wits about a sculptor who imitated the antique, is not this really extraordinary? If the Norwegians had a national enthusiasm for Tidemand the painter, this would be more intelligible, because he is Northern and national in feeling, and painting is a far more popular art than sculpture; but that the Danes should have been so delighted with a maker of pseudo-antique statues, however skilful the imitation, passes all understanding. If they had known Thorvaldsen personally very well, we might have attributed their adoration to a liking for the man; but they knew next to nothing about him, for he had always been an absentee, and though when he came back his long white hair and nice venerable look were of the greatest use to him, still the enthusiasm was already at fever point before the white locks came in sight on the Rota. The explanation of the Thorvaldsen mania in Denmark is that Denmark is a small country, and felt itself elevated by the European fame of one of its children.

#### Colouring of Picture Galleries.

There is generally a disposition to be prodigal of ornaments and gilding in such buildings. Without pretending that all decoration should be proscribed, there is less disadvantage in erring by deficiency than by excess; in fact, the pictures, &c., are the precious objects, and it is upon them that we must attract and fix attention. One of the most injurious things to the effect of pictures is their accumulation—their being crammed together; the position they then occupy, so different from that for which the painter destined them, diminishes the illusion which each would produce if it were in its proper place. Few, except the intelligent connoisseur and amateur, on seeing a picture exhibited in a gallery, experience all the effect which the artist wished to produce. Even the contiguity of the frame to the picture is destructive of the illusion of perspective; hence the difference between the effect of a framed



picture and the effect of the same picture when seen through an opening, which permits us to see neither frame nor limits; it then recalls all the illusion of the diorama. Statues of white marble or stone, as well as plaster casts, stand out well in a gallery, the walls of which are of a pearly-grey colour; and if we would augment the whiteness of the statues by neutralising the red hue which the marble, stone or plaster might have, we could colour the walls with a chamois or orange-grey tint. If, on the contrary, we preferred giving to the statues a warm colour, which many sculptors esteem so highly, the walls must be of blue-grey. Green walls will give to the statues a rosy tint, which is not disagreeable. The tone of their colour must be lower, the brighter we wish the sculptures to be. When there are bronzes, the colour of the walls of the gallery must be determined by that which we wish to predominate in the statues; because, as is very well known, the metallic alloy of which they are formed yields two very different tints; one green, acquired by exposure to atmosphere; the other the peculiar golden tint which it possesses where it is not oxidised. If we wish to exalt this green tint, the colour of the walls of the gallery must be red, while they must be blue to bring out the brilliancy of the metallic bronze, which has not experienced the action of the atmosphere. The walls of the gallery are considered as giving rise to effects of contrast and not of reflection.

### GENERAL.

**Professor Church** will commence his course of lectures to the students of the Royal Academy at 4 P.M. on Monday next. They will be continued on successive Thursdays and Mondays. The subjects will be:—Grounds for Painting; Classification of Pigments; Trials of Pigments; Selected Palettes; Vehicles and Varnishes, and Methods of Painting. The Anatomy Course will begin on October 27.

**Mr. Waller**, of Gloucester, has the supervision of the works of restoration and preservation which are being carried out by the Department of Woods and Forests at Tintern Abbey. Portions of the ruins, which long have remained hidden beneath several feet of soil, have been disclosed, notably the lay-brothers' quarters and the ancient watercourse made by the builders of the abbey.

**Westminster Abbey** was reopened for public service on Wednesday morning. Since Easter Monday it has been closed in consequence of the arrangements for the Coronation.

**M. Hasselrus**, a Danish sculptor now living in Rome, has received the commission for the bust of Shakespeare which it is proposed to erect in Elsinore in a position which will face the Hamlet Terrace in the fortress of Kronberg.

**Architectural Classes** are about to be conducted at the Durham College of Science. Mr. R. S. Twizell will lecture on design and architectural styles.

**St. Columba's Presbyterian Church**, Leeds, which cost to erect about 10,000*l.*, has been offered for sale, but, as the bidding only reached 2,700*l.*, the property was withdrawn.

**The Emperor of Germany** has subscribed 1,000 lire towards the cost of the memorial of Vergil, the poet, which it is proposed to erect in Mantua.

**The Cape Town Railway Station** is to be enlarged and improved at a cost of 140,000*l.* The Government have decided to lay out 1,000,000*l.* in the purchase of additional railway rolling-stock.

**The Annual Autumnal Lecture** will be delivered in St. Bartholomew-the-Great, West Smithfield, on October 11, at 2 30 P.M., and will be repeated on the 25th at the same time. All parts of the church may be visited after the lecture without charge, but a collection will be made towards the purchase of the remains of the cloisters, which are at present used as stables.

**As a Memorial** to the officers from the Royal Military College, Sandhurst, who have fallen in the war in South Africa, it is proposed to erect a reredos in the college chapel, which already contains tablets recording the deaths of 270 officers. The work, which is estimated to cost about a thousand pounds, will be entrusted to Mr. G. F. Bodley, R.A.

**The Works Committee** of the London School Board have accepted the offer of Mr. H. H. Robinson to take out the quantities for sanitary work at a uniform fee of 1½ per cent. for a period of six months. The former arrangement was that 2 per cent. was to be paid on all work under 2,000*l.*

**The Liverpool Architectural Society** will hold their first ordinary meeting of the new session on Monday, October 6. The President will deliver his opening address and the revised schedule of charges will be discussed.

**An Appeal** is made by the rector and churchwardens of St. Andrew-by-the-Wardrobe, Queen Victoria Street, for the sum of about 120*l.* which is required to complete the payment for improving the churchyard.

**A Prize** of 5*l.* has been offered by the Northern Architectural Association towards the expenses of a student who will spend at least a fortnight in England or lands abroad, and who sends by not later than July 31, 1903, a set of drawings consisting of three single and separate perspective architectural sketches in pencil, ink or colour, each on sheets size 15 inches by 11 inches; and three sheets of measured drawings, each sheet not larger than 40 inches by 26½ inches.

**Mr. Elliot Stock** has issued a new edition of the *Memoirs of Coutts & Co.*, the bankers, with photographs and illustrations. A facsimile of the first peerage published in England, viz. in 1734, has also been brought out. It is reproduced from the only copy extant, which is in the British Museum, and will be useful to students of genealogy.

**The Rossetti Memorial Window** in Birchington Church has been seriously injured by robbers who broke into the building.

**The Subscriptions** for the Queen Victoria Memorial now amount to 210,000*l.*

**Mr. Norman Hurst** has been instructed to engrave the portrait by Professor von Herkomer of the late Mr. Cecil Rhodes, painted in 1896. This picture was given by Mr. Rhodes to the Kimberley Club, who have given permission for one replica to be painted by Professor von Herkomer for the late Mr. Rhodes's family.

**Sir John Soane's** museum was the scene of a fire on Saturday night which originated in a bedroom on the top floor. The flames were overcome in less than a quarter of an hour.

**A Sanatorium** for consumptive patients has been completed at Aubrac. It is the first structure of the kind erected on a high altitude in France.

**A New College** is proposed to be erected in connection with the Western Congregational Union at Bristol, which is estimated to cost between 15,000*l.* and 20,000*l.*, to replace the temporary building now occupied.

**Lichfield Grammar School**, in which Addison, Johnson and Garrick were among the pupils, has been sold, with the headmaster's house and adjoining land, for 1,035*l.* A new school is to be built in Barrowcop.

**The Government of Jamaica** are considering two schemes for the construction of a sea wall at Kingston; one involves an expenditure of 40,000*l.* and the other 500,000*l.*

**Excavations** are about to be conducted on the site of the ancient temple of Hera, in Samos, by the Greek Archaeological Society. It was expected that the exploration would be conducted by German archaeologists.

**A Memorial** consisting of three stained-glass windows, together with a mural tablet of alabaster, has been placed in Cranbrook Church, Kent, to the memory of the Rev. William Eddy, vicar of the parish from 1591 to 1616. The donor of the memorial was the late Robert Henry Eddy, of Boston, Massachusetts, who was a descendant of William Eddy, and who bequeathed a sum of 5,000 dols. for that purpose.

**M. Georges Lemaire**, who is preparing the war medal for French troops who were engaged in China, has departed from precedent in modelling the figure of the Republic by substituting the white head-covering of European officers in the East for the classic helmet.

**An Exhibition** illustrative of the history of costume will be opened at St. Petersburg in November. Among the attractions will be the robes of the sovereigns of Russia in ancient and modern times. The German Emperor has promised a collection of military uniforms belonging to various epochs.

**South Shields** proposes to borrow 60,000*l.* for the purpose of erecting new municipal buildings.

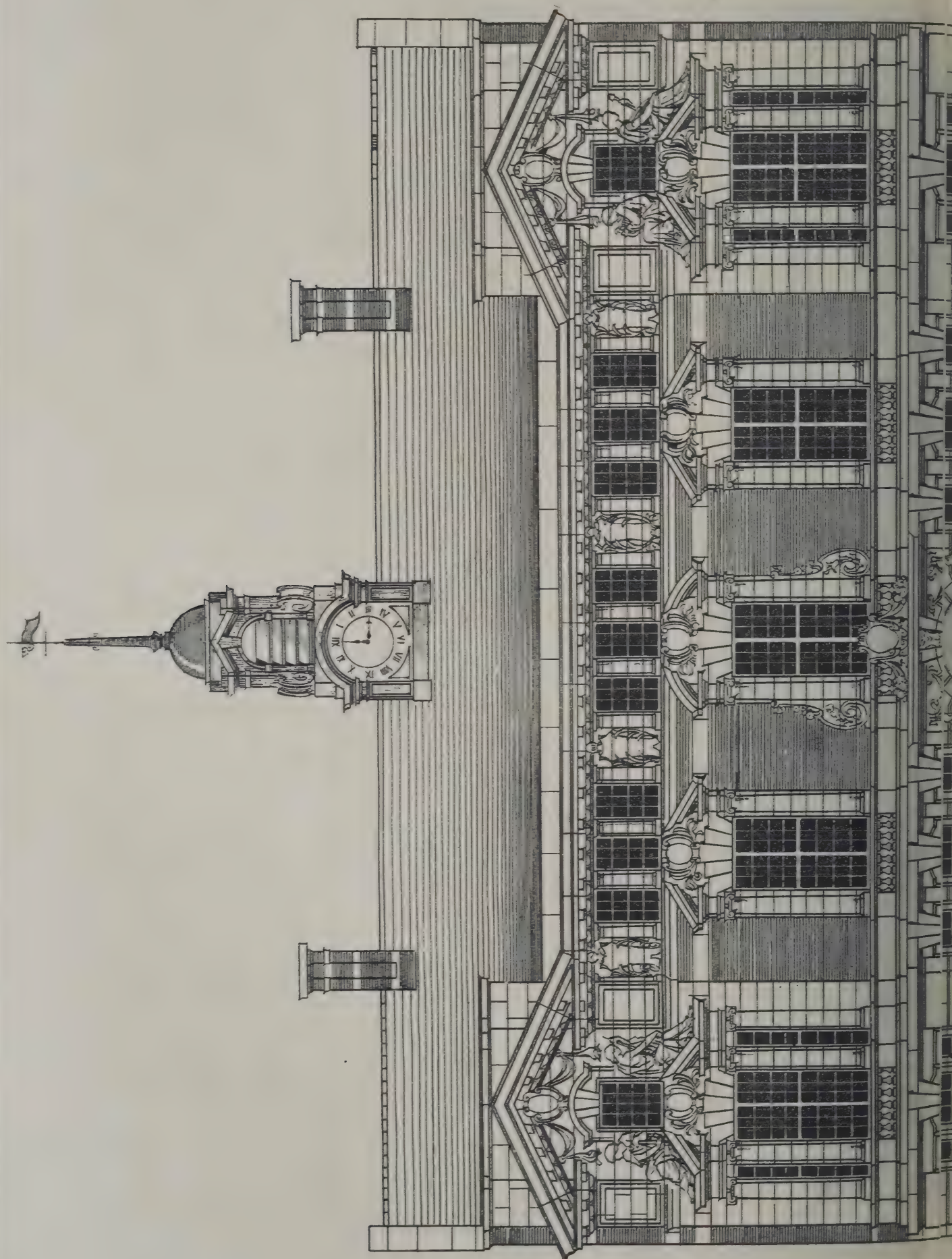
**A Bill** has been introduced in the Legislative Council of India to vest in Government powers similar to those exercised in the United Kingdom under the Works of Defence Act, 1860, to enable the military authorities to maintain clear of buildings and obstructions such zones of fire in the vicinity of works of defence as are essential to their defensive value under the conditions of modern warfare, and in view more especially of the increasing range of firearms.

**The Parish Church**, Little Marlow, Bucks, is now being restored. In the chancel wall was found an old "priest's door," which had been so completely blocked up that only a careful inspection could trace any indication of it in the rough rubble surface that the wall presented. Careful cleaning and clearing out has given back the complete stone arch with some of its mouldings. The second "find" is the original opening to the rood-loft, though no indication remains of the position or character of the steps by which it was approached. The third discovery was made within a cavity in the wall which constituted once the opening to the loft, and consisted of a Norman piscina, which retains its dog-tooth mouldings. This was deposited in the hollow space left when the surface of the entrance was plastered up. It is to be replaced in the corner from which it was torn.





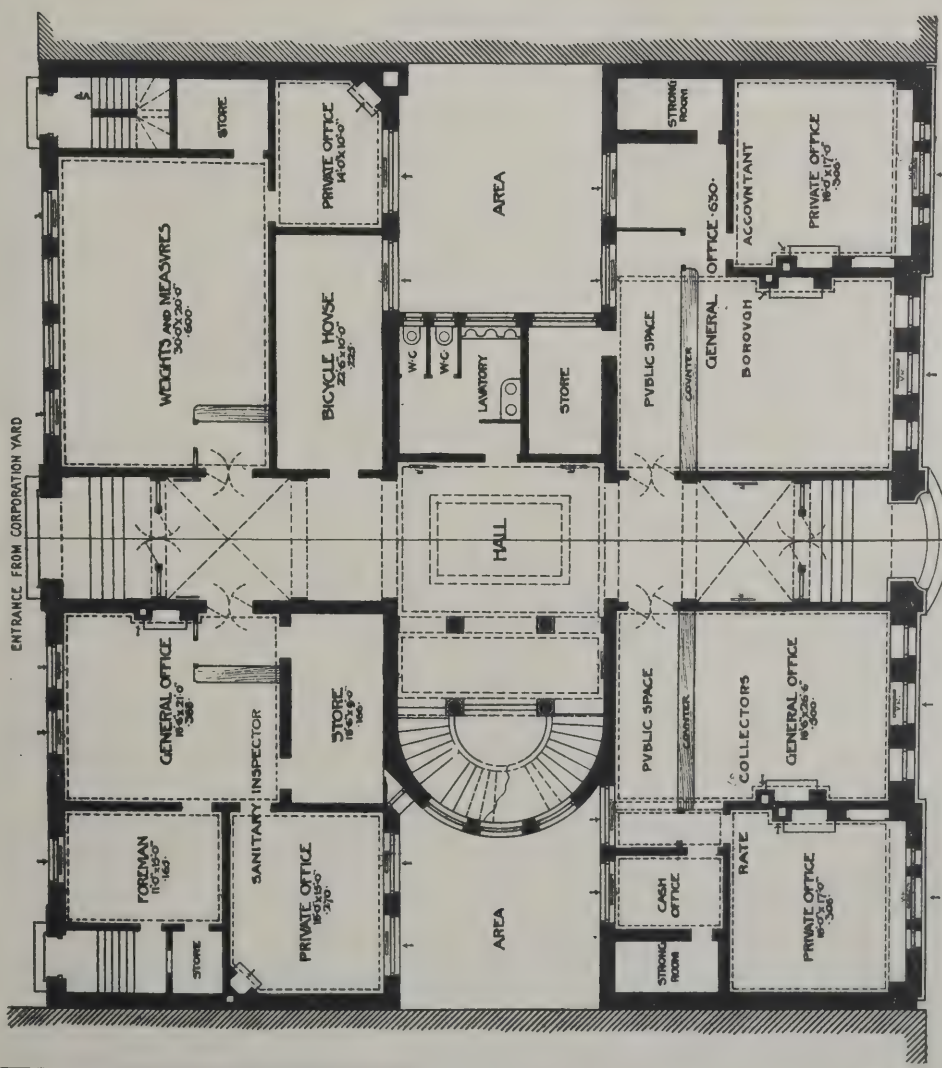




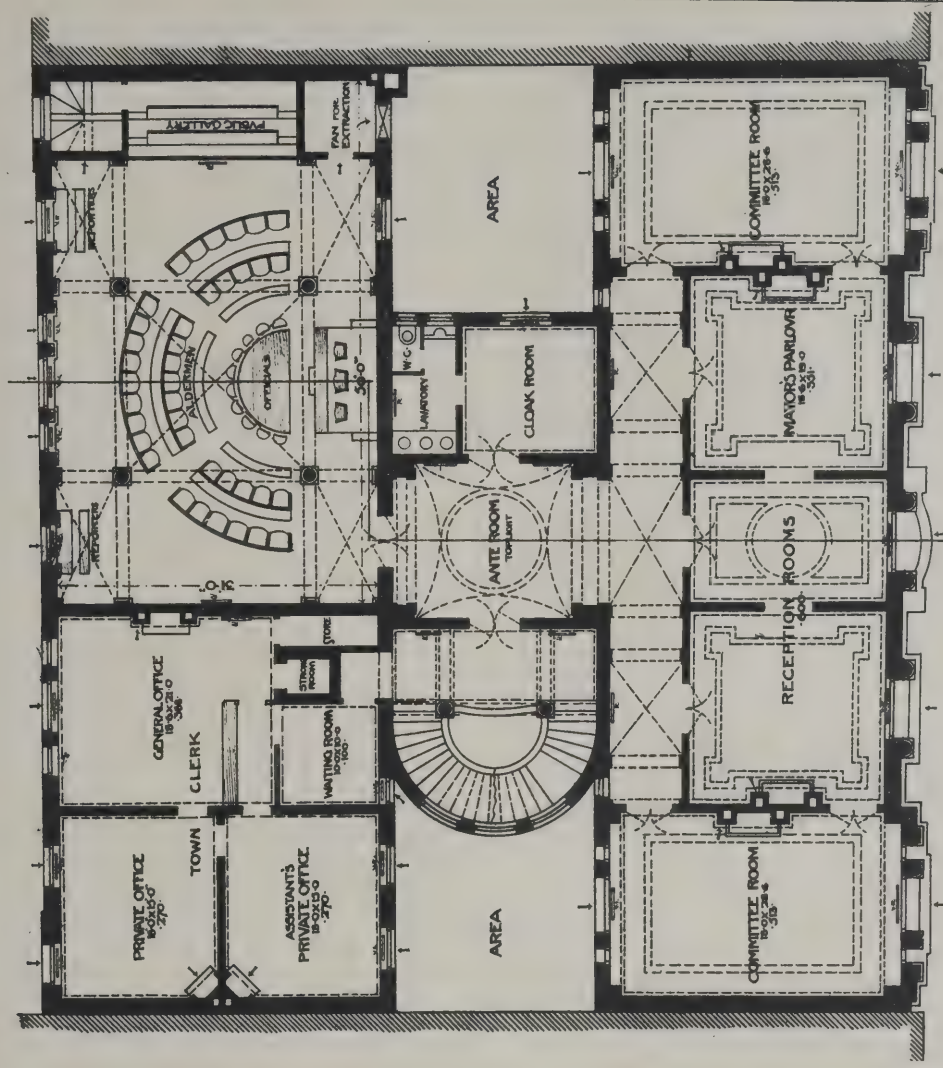




ELEVATION TO EARLE STREET.



GROUND PLAN.



FIRST FLOOR PLAN.

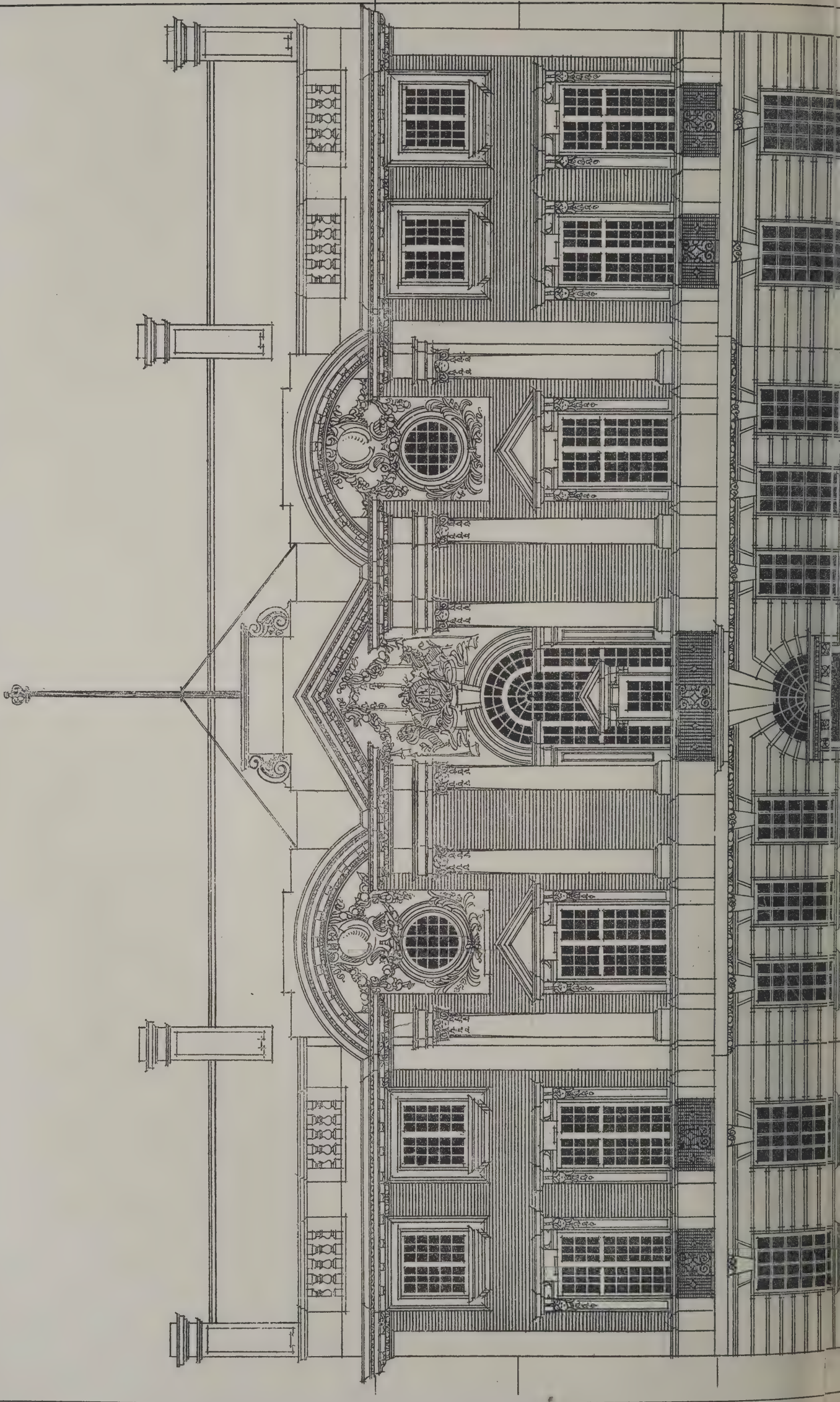








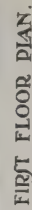








**GROUND PLAN.**



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NEW TOWN HALL, CREWE: ONE OF THE SECOND PREMIATED DESIGNS.

By Messrs. E. G. RODWAY and C. F. W. DENING.





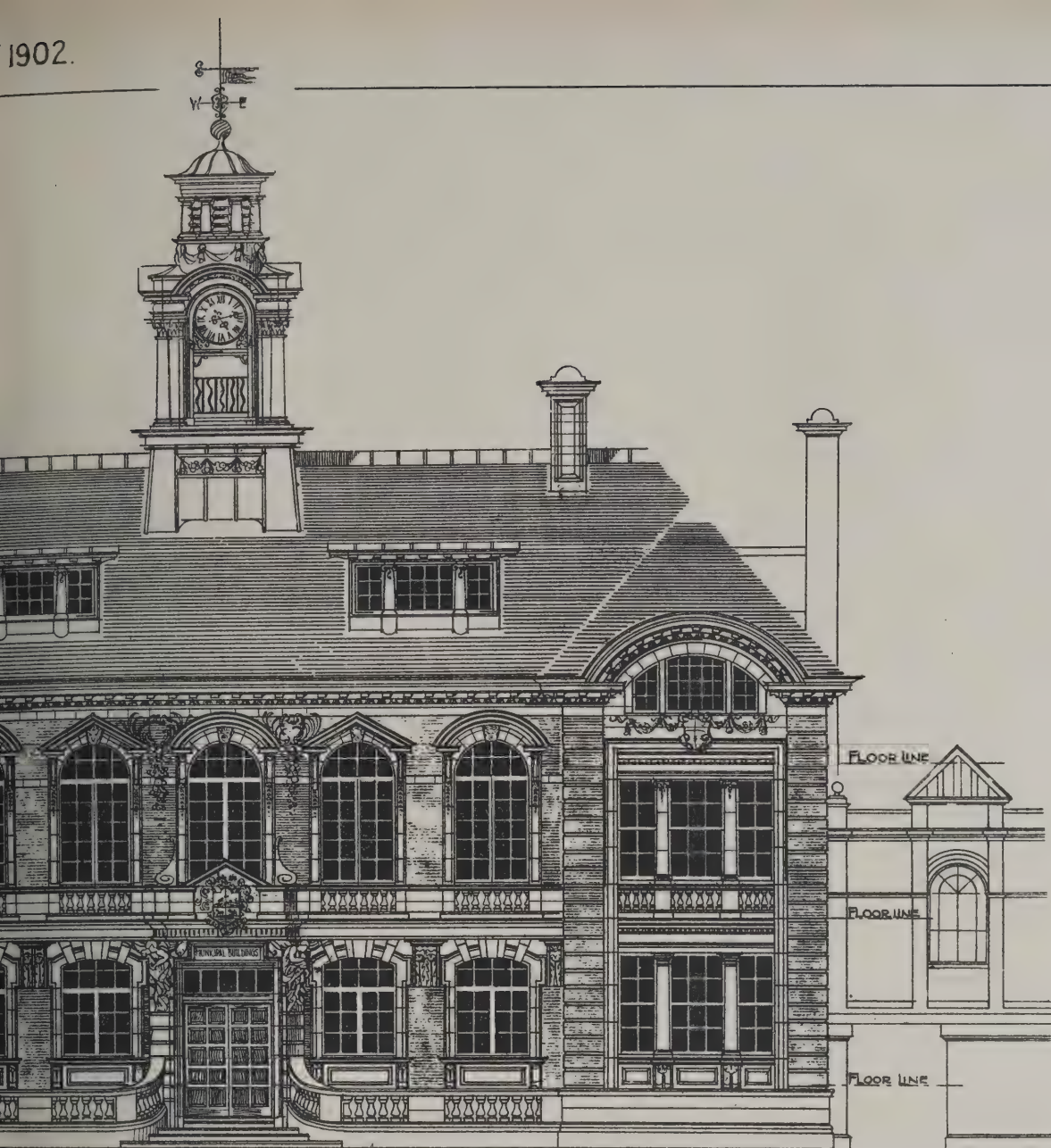






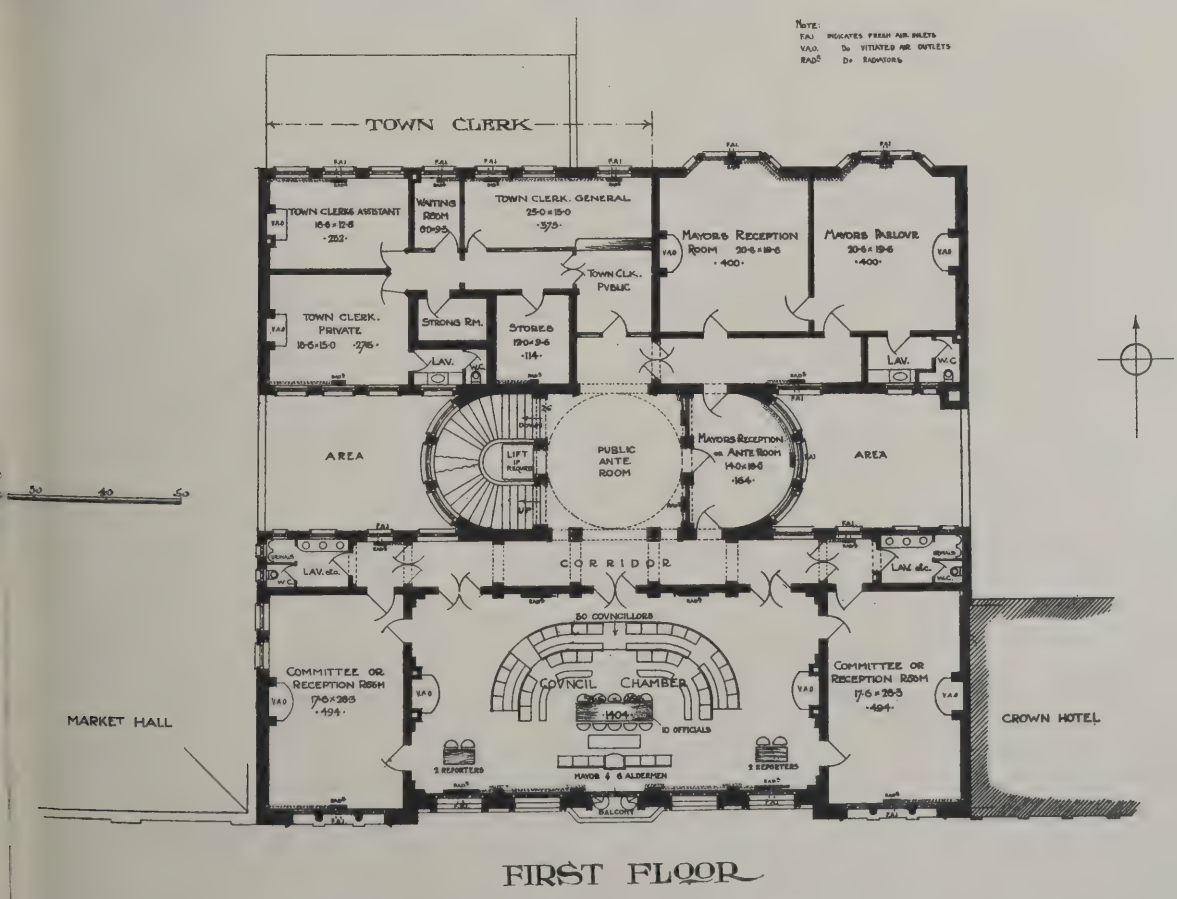






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V.A.O. DO. VENTILATED AIR OUTLETS  
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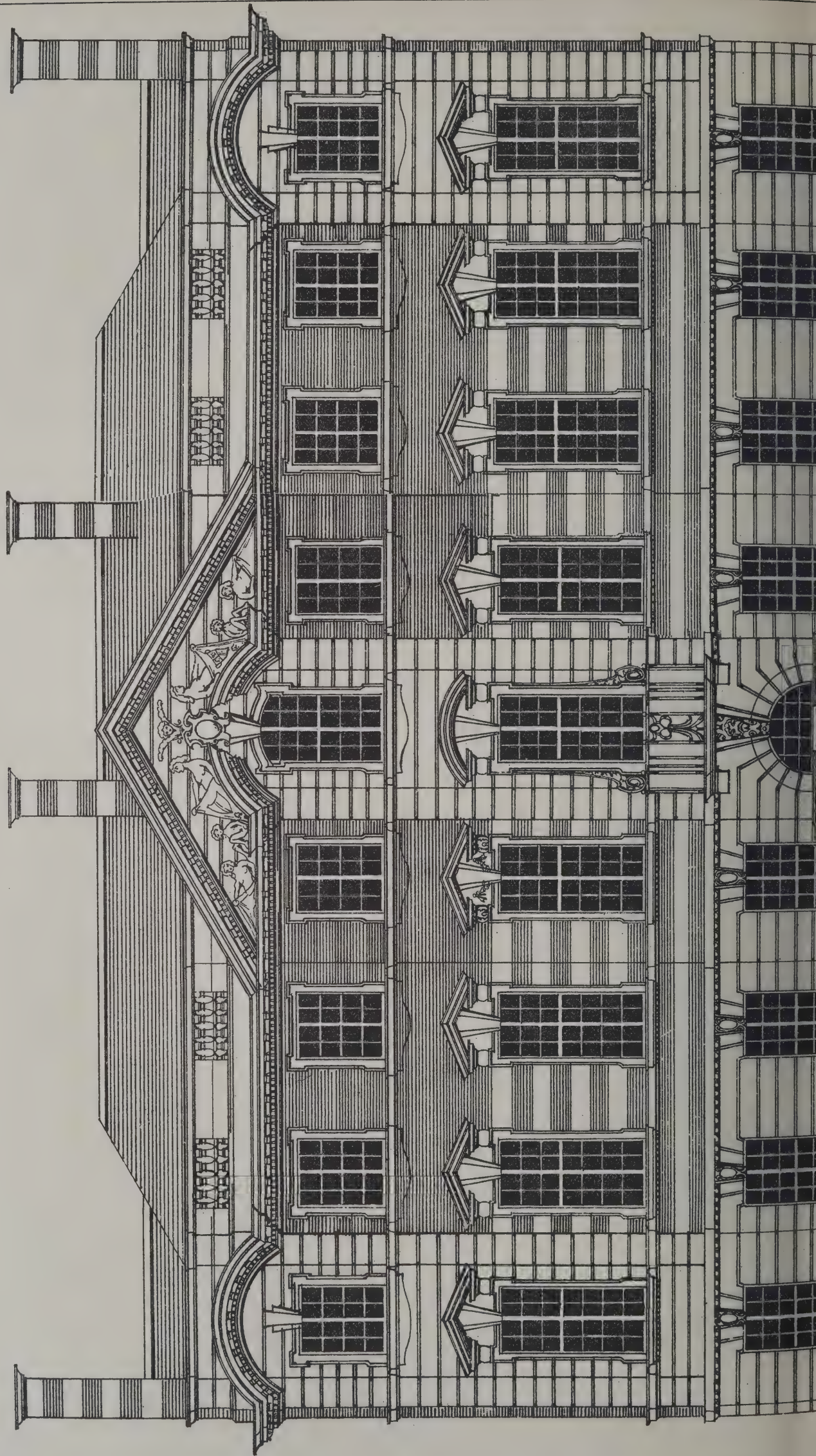






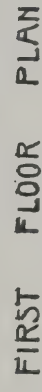








## A vertical scale bar labeled "Feet" at the bottom. It has major tick marks at 0, 5, and 10. There are also minor tick marks between the major ones, indicating increments of 1 unit.



By A. E. DIXON, A.R.I.B.A.







THE

## Architect and Contract Reporter.

## EDITORIAL NOTICES.

*In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

## TENDERS, ETC.

*\*\* As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

## COMPETITIONS OPEN.

**CAPE TOWN.**—Jan. 31.—The Council of the University of the Cape of Good Hope invite designs for the erection of university buildings: Premiums of 400*l.*, 200*l.* and 100*l.* will be awarded to the authors of the designs placed first, second and third respectively. Particulars of the competition may be obtained on application to the Registrar at Cape Town, or to the Agent-General in London.

**GREENWICH.**—Oct. 9.—Designs are invited for a public library (with chambers for chief librarian's residence) to be erected at a cost of about 6,500*l.*, with fittings, on a site about 7,000 feet super, in the borough of Greenwich. Premiums of 50*l.* and 30*l.* are offered. Particulars can be obtained on application to the Greenwich Borough Council.

**HULL.**—The Corporation invite designs for extension of town hall. Premiums of 300*l.*, 200*l.*, and 100*l.* respectively. Particulars from Mr. E. Laverack, town clerk, Town Hall, Hull.

**INDIA.**—Nov. 1.—Competitive designs are invited for the erection of a memorial to Her Majesty the late Queen Victoria at Allahabad. A premium of 2,000 rupees will be awarded to the design selected by the committee. Mr. H. Nelson Wright, Indian Civil Service, honorary secretary, Queen Victoria Memorial Fund Committee, Allahabad, India.

**NEWARK.**—Oct. 14.—Designs and suggestions are invited for alterations and additions at the infirmary, Bowbridge Road, Newark, comprising a board and committee-room, a new mortuary and provision for twenty extra beds. A prize of twenty guineas is offered for the best plans sent to the office of Mr. M. H. Colton, clerk, 27 Lombard Street, Newark.

**STROOD.**—Oct. 15.—Plans are invited for further hospital accommodation on a site recently acquired by the Strood Rural District Council in Whitehill Road, Cobham. A premium of 15*l.* 15*s.* is offered for the best set of plans submitted.

## CONTRACTS OPEN.

**ACCRINGTON.**—Oct. 21.—For new works, Spring Hill, for Lang Bridge, Ltd.: (contract No. 2) erection and completion of the superstructures; (3) supply and fixing of constructional iron and steelwork. Mr. Henry Ross, architect, 15 Cannon Street, Accrington.

**ANDOVER.**—Oct. 9.—For erection of a brick culvert at Amport, Andover. Mr. W. R. Graham, clerk, Rural District Council, Andover, Hants.

**AYLESBURY.**—Oct. 8.—For installation and maintenance of electricity for a term of years. Mr. Percy A. Wright, clerk, Town Hall, Aylesbury.

**BRADFORD.**—Oct. 11.—For extension of shop at Low Moor. Messrs. France, Milnes & France, architects, 99 Swan Arcade, Bradford.

**BRANDON.**—Oct. 6.—For erection of a post-office at Brandon, Suffolk. Mr. James Farley, architect, Old Cross, Hertford.

**BRIDLINGTON.**—Oct. 20.—For construction of underground lavatories in South Cliff Road. Mr. A. E. Matthewman, town clerk, Town Hall, Bridlington.

**BRIMINGTON.**—Oct. 11.—For new schools to be erected at New Brimington, near Chesterfield. Mr. W. Cecil Jackson, 29 Knivesmith Gate, Chesterfield.

**BURTON-UPON-TRENT.**—Oct. 22.—For erection of a car depot in Horninglow Street. Particulars may be obtained at the Borough Engineer's Offices, Town Hall, Burton-upon-Trent.

**CARLISLE.**—Oct. 10.—For erection of four houses in Hawick Street and the conversion of eighteen tenements into eleven houses; also twenty-six tenements into thirteen houses in Duke Street. Mr. H. H. Hodgkinson, architect, 9 Lowther Street, Carlisle.

**CHESTERFIELD.**—Oct. 11.—For erection of schools at New Brimington, near Chesterfield. Mr. W. Cecil Jackson, architect, 29 Knivesmith Gate, Chesterfield.

**CORNWALL.**—Oct. 6.—For alterations and additions to the Tinner's Arms, Zennor. Mr. N. C. Whear, jun., architect, Penzance.

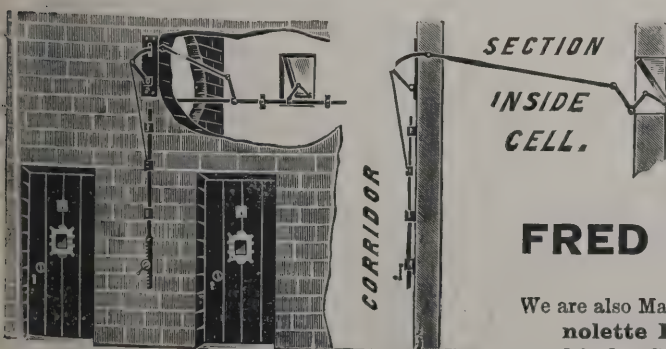
**DOVER.**—Oct. 24.—For erection of new coastguard buildings, consisting of quarters for an officer and seven men, with watchroom, &c., at East Cliff, near Dover. Particulars may be obtained at the Coastguard Station, East Cliff.

**DUDLEY.**—Oct. 11.—For erection of a new upper standard school, with caretaker's house, playgrounds, boundaries, &c., for the Dudley School Board. Messrs. Barrowcliff & Allcock, architects, Mill Street, Loughborough.

**EASTBOURNE.**—Oct. 9.—For alterations to the police station at the town hall. Mr. Wm. Chapman Field, borough architect, Eastbourne.

**ECCLES.**—Oct. 8.—For erection of a public mortuary proposed at the town's yard, Patricroft. Mr. Wm. Henry Hickson, town clerk, Town Hall, Eccles.

**EXETER.**—Oct. 6.—For structural repairs to the public baths and washhouses, King Street. Mr. Geo. R. Shorto, town clerk, Exeter.



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FELIXSTOWE.—Oct. 14.—For erection of stables and cartsheds in Garrison Lane and street works in Brook Lane. Particulars obtained from the Surveyor, Town Hall, Felixstowe.

GLASGOW.—Oct. 8.—For alterations and additions at Dalhousie dépôt. Mr. John Young, general manager, 88 Renfield Street, Glasgow.

GREENWICH.—Oct. 14.—For erection of a weights and measures testing office, with stable building and a coroner's court in Lamb Lane. Particulars may be obtained at the General Section of the Architect's Department, 18 Pall Mall East, S.W.

HARROW.—Oct. 14.—For erection of a court-house at Harrow, Middlesex. Mr. H. T. Wakelam, county architect, Middlesex Guildhall, Westminster.

HATFIELD.—Oct. 8.—For erection of offices and buildings for the county surveyor's department at Hatfield. Particulars may be obtained at the Herts County Surveyor's Office, 41 Parliament Street, S.W.

ILFORD.—Oct. 6.—For supply and erection of contract No. 1: Dry-back semi-marine type boiler (15,000 lbs. evaporation per hour), superheater and accessories, and motor feed-pump; contract No. 2: steam, feed and blow-off pipes, and feed filter; contract No. 3: surface condenser, cooling tower, motor pumps, hot well, grease extractor, exhaust steam and water pipes. Mr. J. W. Benton, clerk, Council Offices.

IRELAND.—For rebuilding premises in Academy Street, Cork. Mr. Arthur Hill, architect, 22 George's Street, Cork.

IRELAND.—Oct. 7.—For putting in new baths, wash-hand basins and wash-tubs, and fitting-up hot-water boiler, at the male and female auxiliary infirmaries at the workhouse, Belfast. Messrs Young & Mackenzie, engineers, &c., Scottish Provident Buildings, Belfast.

IRELAND.—Oct. 11.—For erection of a residence for the chief medical officer at the Castlebar District Lunatic Asylum. Mr. Joseph T. Kelly, clerk of asylum.

IRELAND.—Oct. 19.—For erection of a fire-brigade station at Ardoyne, Belfast. Messrs. Young & Mackenzie, architects, Scottish Provident Buildings, Belfast.

IRELAND.—Oct. 22.—For erection of eighty-four labourers' cottages in the South Dublin Rural District, viz. fifteen cottages, under four contracts, in Clondalkin electoral division; fifteen cottages, under seven contracts, in Palmerston electoral division; thirty-seven cottages, under fourteen contracts, in

Tallaght electoral division; and seventeen cottages, under nine contracts, in Whitechurch electoral division. Mr. T. J. Byrne, surveyor, 1 James's Street, Dublin.

LIGHTCLIFFE.—Oct. 11.—For erection of four houses near the Old Church, Lightcliffe, Yorks. Messrs. Joseph F. Walsh & Graham Nicholas, architects, Museum Chambers, Halifax.

LISCARD.—Oct. 11.—For erection of sand-drying kiln, stables, stores, &c., on land in Seaview Road, Liscard, Cheshire. Mr. H. W. Cook, clerk, Public Offices, Egremont.

LONDON.—Oct. 7.—For erection of a new cartshed, bothy &c., at Sydenham Wells Park, S.E. Particulars at the General Section (Architect's Department), L.C.C., 18 Pall Mall East, S.W.

LONDON.—Oct. 7.—For erection of a refuse destructor. Mr. D. J. Ebbetts, surveyor, 242 High Street, Acton, W.

LONDON.—Oct. 10.—For erection of baths at the artisans dwellings, Stoney Lane. Town Clerk, Public Health Department, Guildhall, E.C.

LOWESTOFT.—Oct. 7.—For construction of a timber pier at Lowestoft. Mr. John F. Stovell, secretary to the Coast Development Company, Ltd., 33 Walbrook, E.C.

NEWCASTLE-ON-TYNE.—For erection of a schoolroom at West Jesmond. Mr. W. H. Knowles, architect, 37 Grainger Street, Newcastle-on-Tyne.

NORTH FEATHERSTONE.—Oct. 14.—For erection of a Primitive Methodist church at North Featherstone, Yorks. Mr. W. G. Smithson, architect, 13 Bond Street, Leeds.

NOTTINGHAM.—For erection of works and offices on Queen's Road. Mr. F. Ball, architect, 23 King Street, Nottingham.

ST. ALBANS.—Oct. 11.—For erection of an infants' school at the Camp, St. Albans. Mr. F. W. Kinneir Tarte, architect, St. Albans.

SALE.—For erection of buildings for the Sale Urban District Council electricity supply. Mr. Charles Hopkinson, 29 Princess Street, Manchester.

SCOTLAND.—Oct. 7.—For brickwork of a new boiler-house, chimney, and setting of two Lancashire boilers, 30 feet by 8 feet, at the gasworks, Greenock. Mr. Colin MacCulloch, town clerk, Greenock.

SCOTLAND.—Oct. 8.—For additions to the public school, Portnockie. Messrs. Sutherland & Jamieson, architects, Elgin.

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SCOTLAND.—Oct. 9.—For erection of new gasworks, Ardrossan. Mr. James Cook, town clerk, Burgh Chambers, Ardrossan, N.B.

SHEFFIELD.—Oct. 13.—For erection of an additional carshed at Queen's Road, Sheffield. Mr. Charles F. Wike, C.E., city surveyor, Town Hall, Sheffield.

SHERBURN HILL.—Oct. 11.—For alterations and additions to the Primitive Methodist chapel, Sherburn Hill, Durham, and erection of a new vestry. Mr. J. Walton Taylor, architect, Newcastle.

SPAIN.—Oct. 12.—Huescar Municipality invites tenders for grant of a concession to light the town by electricity for a term of twenty-five years. Conditions of tender from the authorities.

SPAIN.—Oct. 12.—For works necessary to the installation of a town's water supply. Particulars may be obtained at the Casa Consistorial, Fonzeleche, Spain.

STAMFORD.—Oct. 27.—For erection of an infants' room at Greatford school, and removing and rebuilding the existing outer offices. Specifications and plans to be seen at the school or sent on application.

STARBECK.—Oct. 7.—For construction of a passenger subway under the railway at Starbeck station, York, for the North-Eastern Railway Co. Mr. C. N. Wilkinson, secretary, York.

STRATFORD-ON-AVON.—Oct. 15.—For erection of schools to accommodate 150 children in the village of Pebworth. Messrs. Harvey Bros., architects, 30 King's Road, Evesham. Mr. H. B. Phillips, clerk to School Board, Honeybourne, Evesham.

STROUD.—Oct. 17.—For erection of an isolation hospital, with works incidental thereto, at Cashes Green, Cainscross, near Stroud, Gloucestershire. Mr. G. P. Milnes, architect, &c, Stroud.

TEWKESBURY.—Oct. 13.—For erection of a mortuary at the back of Avon. Mr. H. L. Badham, town clerk, Town Hall, Tewkesbury.

TUNBRIDGE WELLS.—Oct. 18.—For construction of main flues at the central electric-light station. Any information may be obtained on application to the Borough Surveyor, Town Hall, Tunbridge Wells.

WALES.—Oct. 6.—For erection of a schoolroom at Dynevor, Messrs. Martyn & Lloyd, architects, Dynevor Post Office, Neath.

WALES.—Oct. 6.—For erection of a Congregational church and school at Pontypool. Messrs. Swash & Bain, architects, Midland Bank Chambers, Newport, Mon.

WALES.—Oct. 6.—For erection of latrines, &c, at the Troedrhigwair school. Messrs. James & Morgan, architects, Cardiff.

WALES.—Oct. 7.—For erection of thirty-five houses at Ystrad Mynach. Mr. T. W. Miller, architect, Mountain Ash.

WALES.—Oct. 9.—For alterations and additions to the Park Board schools, Aberdare. Mr. T. Roderick, architect, Clifton Street, Aberdare.

WALES.—Oct. 11.—For erection of fifty houses in Aber Bargoed. Mr. G. Kenshole, architect, Station Road, Bargoed.

WALES.—Oct. 11.—For erection of a vestry at Sherwood, Llwynypia. Messrs. Lewis & Morgan, architects, Tonypandy.

WALES.—Oct. 13.—For erection of a new Constitutional club building at Dowlais. Messrs. James & Morgan, architects, Charles Street Chambers, Cardiff.

WALES.—Oct. 16.—For erection of a police station and cells at Llanfairfechan. Mr. J. H. Bodvel Roberts, 10 Castle Street, Carnarvon.

WALES.—Oct. 21.—For repairs to the joint county bridge at Loughor, Carmarthenshire. Mr. J. W. Nicholas, clerk, County Offices, Carmarthen.

WALES.—Oct. 21.—For erection of twenty-eight houses at Newbridge, Abercarn. Mr. George Stevens, surveyor, Council's Office, Abercarn.

WALES.—Oct. 23.—For erection of a boiler and engine-house in connection with existing laundry at the Joint Counties Asylum, Carmarthen. Mr. E. W. Reed, clerk to the asylum, Carmarthen.

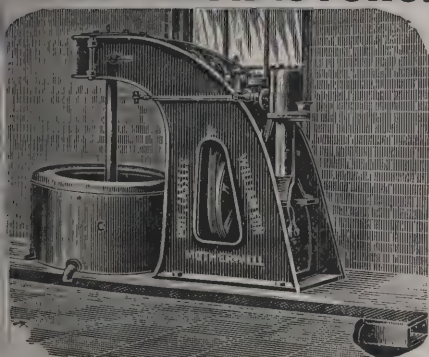
WANDSWORTH.—Oct. 6.—For erection of six maisonettes, Wandsworth Bridge Road. Messrs. F. & W. Stocker, architects, 90 and 91 Queen Street, E.C.

WETHERBY.—For erection of a vicarage, Raby Park, Wetherby. Mr. Arthur A. Gibson, architect, 5 Prospect Crescent, Harrogate.

WIGAN.—Oct. 7.—For erection of a hospital in Park Lane, Abram. Messrs. Heaton, Ralph & Heaton, architects, Wigan.

WILLINGTON.—Oct. 7.—For erection of a Board school and teacher's house at Sunnybrow, near Willington, co. Durham. Mr. Ralph Dixon, clerk to School Board, West Road House, Crook.

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J. Foster	254	18	0
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C. G. Fowler	166	14	3
D. Coker	162	13	6
C. BLUETT, Normandy, near Guildford (accepted)	149	17	5

## Town hall.

C. Bluett	200	0	0
P. McCarthy	140	0	0
J. Foster	98	3	0
C. G. Fowler	95	13	4
D. Coker	91	16	0
A. FRANKS (accepted)	89	10	0

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A. Franks	83	12	0
G. J. Macey	82	15	0
J. Foster	75	14	0
C. G. Fowler	58	13	10
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J. WALSH, LTD, Sheffield (accepted)	£749	0	0
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## HURDSFIELD.

For erection of a stone staircase and cloakrooms at Church Street school, Hurdsfield, Macclesfield. Mr. JABEZ WRIGHT, architect, Macclesfield.

J. DAKIN, Steeple Street, Macclesfield (accepted)	£233	6	9
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## HUDDERSFIELD.

For painting outside of the workhouse premises at Crosland Moor, and the interior of maternity wards, the reception wards and three bedrooms in the main building.

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B. W. Ingham & Son	192	3	0
A. Beevers & Sons	172	0	0
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J. H. Preston	45	0	0
T. Coldwell	42	10	0
Spence & Co.	38	18	6
D. Hinchliffe & Sons	35	0	0
B & J. Thornton	33	10	0
G. QUARMBY & SON, Upperbridge, Holmfirth (accepted)	30	0	0

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For erection of an underground transformer sub-station building in Sackville Street, Dublin. Mr. SPENCER HARTY, city engineer, City Hall, Dublin.

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For installation of a system of hot-water supply at the workhouse infirmary, Kinsale.

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For street works in Rojack Road, Forest Hill.

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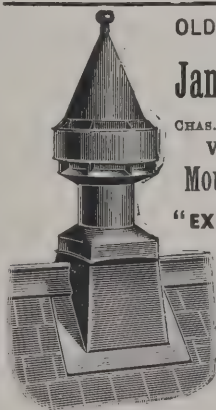
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J. Ramsbottom	9,900	0 0
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Burgess & Galt	8,970	0 0
B. Morton	8,937	0 0
Normanton & Sons	8,839	0 0
T. & W. Meadows	8,776	0 0
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W. THORPE, 380 Chester Road, Old Trafford, Manchester (accepted)	8,587	0 0

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For erection of a school for 280 children, caretaker's house, &c., at Lonesome. Mr. H. CARTER PEGG, architect, 137 Brigstock Road, Thornton Heath.

E. J. Burnand	£5,040	10 0
General Builders' Co.	4,997	0 0
R. A. Lowe	4,995	0 0
Jenkins & Co.	4,803	0 0
W. Smith & Sons	4,768	0 0
Burges & Sons	4,700	0 0
H. LENEY & SON, 36 Hawthorne Grove, Penge (accepted)	4,580	0 0

## NOTTINGHAM.

For painting the tramway poles on the Lenton and Radford boulevards. Mr. ARTHUR BROWN, city engineer.

M. Prince	£141	17 6
Smeeton & Son	106	4 0
G. H. Maddock	103	0 6
W. M. TIMMS, Nottingham (accepted)	101	18 6

## NOTTINGHAM—continued.

For erection of a refuse destructor and stables at the Wollaton Road depot:—Contract No. 1—Erection and completion of destructor building, fan-room, stores, chimney 160 feet high and stabling. Contract No. 2—About 50 tons of steelwork in roof principals, purlins, trough flooring, girders and stanchions, &c, and about 6½ tons of cast ironwork in chimney cap, roof standards, &c. Mr. ARTHUR BROWN, engineer.

## Contract No. 1.

G. A. Pillatt	£5,918	13 0
W. Woodsend	5,642	0 0
W. Maule	5,510	0 0
T. Barlow	5,415	0 0
H. Vickers & Son	5,149	0 0
J. H. Williamson	5,090	0 0
J. HUTCHINSON & SON, Nottingham (accepted)	4,820	0 0

## Contract No. 2.

Constructional Engineering Co.	1,986	0 0
A. Handyside & Co.	1,042	17 3
G. Sands & Son	1,041	0 0
T. W. Ward	1,030	0 0
Westwood and Wright's Hope Gasholder & Engineering Co.	993	8 0
Newton, Chambers & Co.	960	0 0
J. Tildesley, Ltd.	924	17 6
Baxendale Bros.	924	0 0
HORSELEY CO., Tipton (accepted)	872	15 2

## PORTSMOUTH.

For erection of a mortuary at workhouse, Portsmouth. Mr. PRICKETT, engineer.

S. Salter	£1,694	0 0
J. Hardy	1,690	0 0
M. Coltherup	1,649	0 0
H. Clark & Son	1,620	0 0
J. Crockerell	1,620	0 0
E. & A. Springings	1,592	0 0
J. Tanner	1,530	0 0
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W. LEARMOUTH (accepted)	1,369	0 0

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H. Clark & Son . . . . .	374 0 0
J. Tanner . . . . .	312 0 0
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J. Crockerell . . . . .	297 0 0
M. Coltherup . . . . .	294 0 0
E. & A. Springs . . . . .	282 0 0
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For supply of about 290 yards of unclimbable iron railing. Mr. S. S. PLATT, borough surveyor.

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For extension of the heating apparatus at the technical institute. Mr. GEO. JENNINGS, borough surveyor.

BRIGHTSIDE FOUNDRY AND ENGINEERING COMPANY, Sheffield (accepted) . . . . . £67 0 0

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T. Knight . . . . .	£1,228 0 0
H. Somerford & Son . . . . .	1,132 0 0
J. Smith . . . . .	1,129 0 0
Stebbing & Pannett . . . . .	974 10 0

## SCOTLAND.

For streetwork in Bedford Place, Glasshouse Loan, and lifting and recausewaying Drysdale Street, Alloa. Mr. A. MACKIE, burgh surveyor.

R. C. Brebner & Co. . . . .	£4,687 15 1
D. B. Shaw . . . . .	4,490 1 9
H. Brunton & Son . . . . .	4,422 16 5
W. Wilson . . . . .	4,204 4 7
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Bowden Lime Co. . . . .	3,873 16 4
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J. Kennedy . . . . .	3,762 14 1
W. DOBSON, Yeaman Lane, Edinburgh (accepted) . . . . .	3,749 5 3

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For erection of an infants' school at Grangemouth. Mr. JAMES STRANG, architect, Vicar Street, Falkirk.

## Accepted tenders.

R. Paton, Laurieston, Falkirk, digger.  
G. Sanderson, Falkirk, mason.  
J. & P. Dewar, Falkirk, carpenter and joiner.  
Aitken Bros., Grangemouth, plumber and gasfitter.  
J. Millar, Falkirk, slater, plasterer and cementer.  
D. O'May, Falkirk, glazier.  
J. Combe & Sons, Glasgow, heating.  
O'Brien & Meek, Falkirk, painter.  
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## SOUTHAMPTON.

For construction of tramways in Onslow Road, Bevoir Valley and Portswood Road, having a total length of about 2,058 yards of single track. Mr. J. A. CROWTHER, borough engineer.

M. A. Shepstone & Co. . . . .	£3,317 11 0
P. Smith . . . . .	3,040 14 0
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F. Oldfield . . . . .	441 15 3
Boyce, Bradley & Co. . . . .	434 11 0
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C. Barnard . . . . .	396 15 0
R. Fisher . . . . .	395 4 0
T. Bell . . . . .	393 3 0
M. Medforth . . . . .	369 0 0
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For erection of new laundry at the Banstead Road schools, Sutton, for the Managers of the Metropolitan Asylums Board. Messrs. NEWMAN & NEWMAN, architects, 31 Tooley Street, London Bridge, S.E. Quantities by Messrs. BARBER & SONS, 22 Buckingham Street, Adelphi, W.C.

J. R. Bex . . . . .	£12,222	0	0
Potter Bros. . . . .	12,138	0	0
W. Reason . . . . .	11,945	0	0
Gardener & Hazel . . . . .	11,916	0	0
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T. Cole . . . . .	11,838	0	0
Cropley Bros. . . . .	11,829	0	0
Bowyer & Co. . . . .	11,744	0	0
Goddard & Sons . . . . .	11,700	0	0
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R. L. Tonge . . . . .	11,157	0	0
Samuel Page . . . . .	11,100	0	0
J. B. POTTER, Sutton ( <i>accepted</i> ) . . . . .	11,099	0	0

**TIPTON.**

For street works in Castle Road, Tipton, Staffs. Mr. W. H. JUKES, surveyor.

Currall, Lewis & Martin . . . . .	£675	0	0
E. Boore . . . . .	630	1	3
S. Saunders . . . . .	616	6	0
W. Thompson & Co. . . . .	587	3	8
A. Cooper & Sons . . . . .	575	12	6
J. Bateman . . . . .	575	0	0
J. Hunt . . . . .	566	14	0
T. ALLSOPP, Walton Street, Tipton ( <i>accepted</i> ) . . . . .	469	0	0

**WALES.**

For erection of about 550 yards of close timber fencing and about 410 yards of post and wire fencing at the sanatorium, Cardiff. Mr. W. HARPUR, borough engineer.

W. T. Morgan . . . . .	£465	0	0
F. Ashley . . . . .	350	15	0
J. Hamlett . . . . .	290	0	0
J. Thomas . . . . .	259	0	0
F. WATERMAN, 102 Llanfair Road ( <i>accepted</i> ) . . . . .	199	6	2

**WALES**—*continued.*

For supply of limestone, delivered (carriage paid) at the rate of 60 tons per week, for the Nantyglo and Blaina (Mon) Urban District Council. Mr. W. R. ROACH, surveyor.

*Accepted tenders.*

J. A. Jebb, Tylerbont Quarries, Brecon, 1,000 tons at 5s. 3d. per ton.			
Clee Hill Granite Co., Ludlow, 200 tons at 11s. 8d. per ton.			
For renovating Malakoff House, Brecon Road, Abergavenny. Mr. B. J. FRANCIS, architect, Abergavenny.			
J. G. THOMAS & SONS, Abergavenny ( <i>accepted</i> )	£250	0	0

**WAKEFIELD.**

For supply and fixing of a cast-iron water-tank at Warmfield. Mr. FRANK MASSIE, engineer, Tetley House, Wakefield.

Sheepbridge Iron Co. . . . .	£245	0	0
W. Smith & Bros. . . . .	210	0	0
G. Tankard . . . . .	209	10	0
Ashworth, Hall & Co. . . . .	200	0	0
Bagshaw & Son . . . . .	197	6	9
Wright & Sons . . . . .	189	0	0
G. Crossley . . . . .	161	17	6
Fotherby & Co. . . . .	150	0	0
Whessoe Foundry Co. . . . .	149	0	0
W. R. Renshaw & Co. . . . .	142	5	0
J. W. Harrison . . . . .	139	0	0
H. E. Hodgson . . . . .	138	0	0
T. HOWDEN & SONS, Wakefield ( <i>accepted</i> ) . . . . .	135	0	0

**WEMBLEY.**

For excavating and wheeling away about 1,000 yards cube for filter-beds at sewage outfall works, Perivale Lane, Alperton. Mr. CECIL R. W. CHAPMAN, surveyor.  
HOLLINGSWORTH, Wealdstone, N.W., 1s. per yard cube (*accepted*).

**WESTERHAM HILL.**

For alterations and additions to Fox and Hounds, Westerham Hill, Kent, for Messrs. Fox & Sons. Mr. G. ST. PIERRE HARRIS, architect, 8 Ironmonger Lane, E.C.  
E. MARTIN & SON, Westerham (*accepted*) . £1,472 13 0

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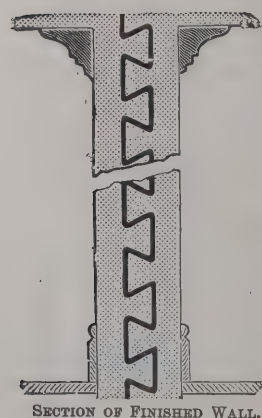
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**TRADE NOTES.**

THE Belgrave Hospital for Children, London, is being warmed and ventilated by means of Shorland's double-fronted and single-fronted patent Manchester stoves in glazed faience with descending smoke flues.

MR. J. PERCY DAY, 3 Victoria Street, S.W., sends us samples of Euboelith, patent flooring and copies of numerous testimonials as to its durability and cleanliness from users who have adopted it in hospitals, public buildings, factories, &c. It is claimed for "Euboelith" that it is adaptable for all kinds of floors, and is jointless, waterproof and fire-resisting, and not affected by heat or cold.

THEIR balance sheet, which shows 7 per cent, and carried forward no less than 3,350%, is the best testimony to the appreciation of the excellent work done by Drake & Gorham, Ltd., in country house lighting. Work has been done or is in hand for Lord Spencer, Lord Berkeley, Lord Stanley, Lord Kenyon, Lord Ducie, Lord Dudley, Lord Harris, Lady Price-Fothergill, Sir William Cuthbert Quilter, Sir T. V. S. Gooch, Sir W. Young, Sir W. Colville, &c.

WE have received from the Hine & Waters Flexicle Cowl Company, Ltd., particulars of the "flexicle" cowl manufactured by them. Its construction permits of a free passage of the sweep's brush by the opening of two pivoted portions, which automatically return to position after the brush is withdrawn, and obviates the necessity of a revolving head. It is also claimed for this cowl that owing to the impossibility of down-draught and the certainty of an up-draught, it is specially adapted to act as a terminal for ventilating shafts.

**ELECTRIC NOTES.**

THE Colwyn Bay Town Council has resolved to practically double the resources of the electric-lighting station.

THE Dorking Urban District Council has decided to borrow 20,000% for an electric-light installation.

THE Boston Town Council has applied to the Board of Trade to extend its provisional order, and is, we understand, open to negotiate with any company that may wish to come in.

THE Caerphilly Urban District Council has commissioned Mr. R. H. Fletcher, their electrical engineer, to apply for a provisional order for supplying the district with electricity.

THE Wakefield City Council has resolved to apply to the Local Government Board for sanction to borrow 15,000% for electric-lighting purposes.

THE St. Helens (Lancs) electric supply committee have instructed the town clerk to apply to the Local Government Board for sanction to the borrowing of the sums of 5,600% for extensions of mains, overhead work, &c, and 2,000% for the erection of a retaining wall, and the alteration of railway sidings at the power station, Cropper's Hill.

AT a meeting of the Berwick Harbour Commissioners a lease was sealed of a portion of the old shipbuilding yard on Berwick quay to the Urban Electric Supply Company for the purpose of erecting installation works. The company have for some time been in negotiation with Berwick sanitary authority for the electric lighting of the town.

AN important extension of the municipal tramway system at Brighton has been agreed to by the Town Council. The amount to be expended is nearly 40,000%. One of the new lines will connect the Royal Pavilion with the Central railway station, another will stretch to the limit of the borough along the Dyke Road, and a third, though only a short line, will have the important effect of linking the Brighton system with the projected tramways for Hove. The committee reserved for a future report a project for bringing the service within touch of the King's Road, near the West pier.

THE Edmonton District Council was recommended to invite three electrical engineers to submit reports and estimates of the cost of schemes for carrying out the electric-lighting order of the Council (1) for generating station and generating plant, and (2) for electric mains and distribution, and also an estimate of annual expenses and revenue. Also that the North Metropolitan Electric Power Supply Company be invited to submit their terms (1) for supplying electric energy in bulk, and (2) for supply and distribution complete for all purposes. The report was amended to the effect that others besides the North Metropolitan Company should be invited to tender, and was then adopted.

A LOCAL Government Board inquiry has been held at Barrow concerning an application by the Corporation for sanction to borrow 20,000% for the purpose of extending the electric-lighting system. The town clerk explained that the application was being made in consequence of an increased demand for the supply of electricity, and also in respect of an agreement entered into with the British Electric Traction

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Company for a supply of current for the proposed reconstructed tramway system. It was three and a half years since the current was first supplied by the Corporation, and the demand was now so great that the capacity of the works was practically exhausted. The total amount already borrowed was 58,575/. It was proposed to ask for repayment over a period of thirty years, and that the commencement of the repayment be deferred for three years. The inspector said that he was afraid this would not be allowed, as the Local Government Board had decided they had no power to grant it. It was anticipated the extensions would meet the requirements of the borough for two years.

At the last monthly meeting of the Wallasey District Council the gas and electricity committee made a recommendation that the Council apply to the Local Government Board for sanction to borrow 52,350/. for electricity extensions. The matter was referred back in order that it might be discussed by the members of the tramways, gas and electricity committees. A meeting of this joint committee has been held, and a statement of the engineer, showing the probable requirements of the electricity works in the matter of capital expenditure for the next seven years, was considered, and it was recommended to the finance committee, who in turn recommended the Council to borrow the sum named. In view of a report of the electrical engineer, the gas and electricity committee recommend that the charge for electric energy to the tramways committee be 1½d. per unit instead of 2¼d., and that in regard to the charges for energy to consumers in the district there be a reduction in the energy required to be consumed before becoming entitled to the lower scale of half unit per lamp, that is, two units instead of two and a half as at present, and a reduction also of 1d. in the lower scale, viz. from 4d. to 3d. per unit, the initial price of 6d. remaining.

### VARIETIES.

THE dedication of the new Roman Catholic church at New Ross, Ireland, took place on Friday last. The cost of erection of this building is upwards of 25,000/.

THE Bishop of Wakefield (Dr. Eden) last week consecrated a new chancel which has been erected at Christ Church, Woodhouse, Huddersfield.

THE Crewe Town Council on Wednesday decided to make application to the Local Government Board for authority to borrow 15,000/. for the erection of the new municipal offices.

AN anonymous donor has offered to give a free library and museum to Beverley provided that a suitable site is obtained. A committee of the Corporation is to report on the subject.

A NEW convalescent ward, erected at the Barnsley Beckett hospital by Mr. William Moore in memory of his late wife, was formally opened by the donor on the 25th ult. The structure has cost about 350/.

THE new entrance lock to the South Dock at Swansea, constructed at a cost of 100,000/., was formally opened on the 25th ult. The new lock, which is 375 feet in length, provides 34 feet of water, an increase of 10 feet. The first vessel to enter was the Glasgow steamer *Tweed*.

THE first sessional papers' meeting of the Manchester Society of Architects will be held on Thursday next, October 9, when Mr. Alfred Darbyshire, F.R.I.B.A., F.S.A., &c., will read his presidential address.

THE new Primitive Methodist chapel which has been erected at Badshot Lea was opened on the 26th ult. It is built of red brick with stone facings, and has a beautiful stone turret. The new building, which has accommodation for 220, is situated close to the old chapel, a comparatively diminutive structure which was erected in 1867, and will in future be used as a Sunday school.

AN extensive scheme for the complete ventilation of the tunnels of the Central London Railway has been prepared by Sir Benjamin Baker, consulting engineer to the company, and will be presented to the directorate. The scheme is understood to provide for the placing of air-pipes through the entire length of the tunnels and the laying down of a special pumping plant at the generating station at Shepherd's Bush.

THE consecration of the new church of St. Michael and All Angels, Cornholme, Todmorden, was performed by the Bishop of Wakefield on Saturday afternoon. The new building provides seating accommodation for about 500 persons. It supersedes an iron building erected a few years ago, when a mission was first established at the Cornholme end of Harleywood parish, and is in the centre of a fairly large population.

THE new Roman Catholic cathedral at Durban is rapidly approaching completion. It is an imposing structure of

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## ILLUSTRATIONS.

PREMIATED DESIGNS FOR PROPOSED NEW MUNICIPAL  
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150 feet in length and over 60 feet wide. There is a fine vaulted roof and a tower 120 feet high. The floor, arches and columns are of marble, brought from Carrara. This is the first building in Durban in which arches of this material have been introduced. Adjoining is a commodious presbytery with a promenade, also a sacristy and a school.

THE new Barry Road schools, Northampton, which have been erected at a cost of 25,000*l.*, were formally opened on the 28th ult. The buildings, which were designed by Messrs. Law & Harris, architects, Sheep Street, Northampton, are throughout up-to-date in every respect, and nothing has been stinted to make them model schools. Accommodation is provided for 420 boys, 420 girls and 530 infants. An excellent swimming-bath and the necessary laundry has also been provided.

THE new church of St. Peter, Bounces Road, Edmonton, a thickly populated and poor parish, has been consecrated by the Bishop of Islington. The cost of the building (10,000*l.*) is defrayed by the Ecclesiastical Commissioners from money received by them for the sale of a site of one of the City churches. The new church is in the Gothic style, of red brick, terra-cotta, and faced with Portland stone. It is lofty and well lighted, the flooring being of wood, and seating accommodation for 840 worshippers, the seats being chairs, with a book rest and kneeling mats for each.

A REDEMPTORIST monastery at Monkwearmouth, Sunderland, was opened on the 25th ult. by Dr. Preston, bishop auxiliary of the Roman Catholic diocese of Hexham and Newcastle. The building adjoins St. Benet's Church, and has cost 4,500*l.* It is said to be within a stone's throw of the spot on which over twelve centuries ago St. Benet founded the Benedictine abbey in which the Venerable Bede received his early monastic training. At present there are seven priests and five lay brothers in residence, but these numbers will be increased shortly, as the house is to serve as the headquarters for the Redemptorist Order in the North of England.

## BUILDING AND BUILDERS.

THE foundation-stone has been laid of a new Voluntary school to accommodate about 300 scholars at Pontefract.

THE corner-stone of a new gymnasium for the Ossett Parish Church Gymnastic Club has been laid by the mayor, Councillor W. Townend. The building is to cost about 300*l.*

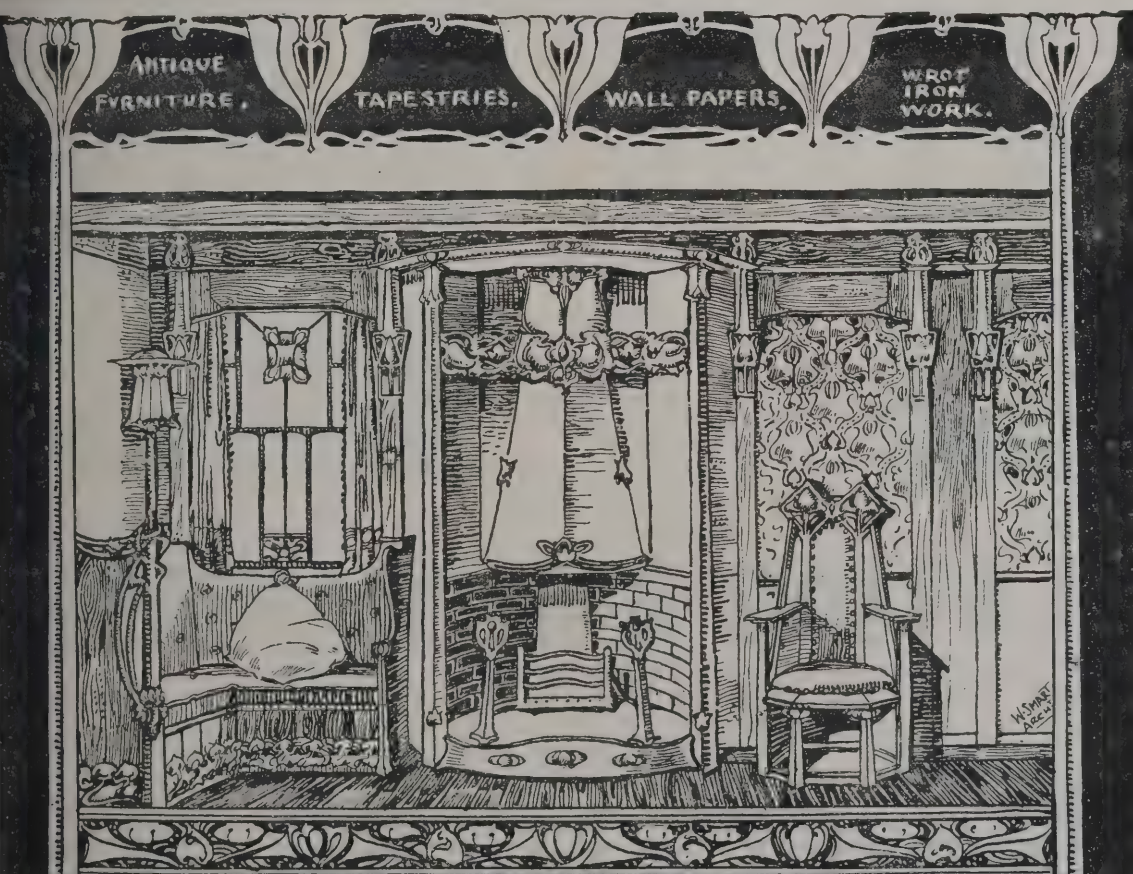
THE Flintshire County Council have agreed to build a bridge at Higher Wych with the co-operation of the Cheshire County Council from plans prepared by Mr. Wyatt, of Ellesmere.

THE foundation-stones of two new Jewish synagogues for Hull were laid on the 26th ult., the one in Linnaeus Street and the other off Osborne Street, there being a sort of rivalry between two sections of the Jewish residents.

THE Merthyr Tydfil District Council, who have established large waterworks, are about to proceed to Parliament for powers to construct sixteen miles of aqueduct in connection therewith. The scheme, which will probably cost 100,000*l.*, contemplates sixteen miles of pipes. Twenty-inch mains will replace 12-inch mains from Upper Neuadd reservoir to Dowlais, in order that the supply to the works of Messrs. Guest, Keen & Nettlefolds may be increased from half a million to one million gallons per day.

AT a meeting of the school committee of Dundee School Board, a letter was read from the Education Department refusing permission to use accommodation in one of the schools in the east end for the purpose of conducting cookery classes, and stating that a new school in that district was necessary. They advised the Board to proceed with the erection of the new building immediately, and in view of this instructions were given to a committee to look out for a suitable site as soon as possible. It is believed that the new school will involve an expenditure of 10,000*l.*

A NEW Primitive Methodist church, erected in memory of the late Rev. T. M'Pherson, who was a Methodist preacher for over fifty years, has been opened in High Lane, Chorlton-cum-Hardy, by Mrs. Leese. The chapel is of red brick with Bath-stone dressings, and has accommodation for 450 worshippers. The total cost, including the schoolroom, is 3,200*l.*, of which 1,600*l.* has been raised. A public meeting was held in the evening, at which an address was delivered by the Rev. T. Mitchell, president of the Conference.



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MR. JAMES BARRON, C.E., has, as desired, submitted for the consideration of the local authorities a scheme for improving the entrance to the old or west harbour at Roseheart. Mr. Barron estimates the cost of the works of extension, including the removal and re-erection of a lighthouse on the extended pier, at 3,000/. Mr. Maconochie, M.P., has intimated his willingness to subscribe 100% towards the cost, and an application is to be made to the Fishery Board for a contribution.

THE foundation-stone of the new church at Port Sunlight was laid on the 30th ult. by Mrs. W. H. Lever. The edifice, which will be called Christ Church, is being erected upon land adjoining Church Road. It is in the Gothic style, will be constructed inside and externally of Helsby red sandstone, and will accommodate a congregation of about 800, although on festival occasions room could be provided for 1,000. In addition, there will be accommodation for a choir of 40. The architects for the church are Messrs. Wm. & Segar Owen, Warrington, and the construction is being carried out by Messrs. Lever Brothers' building department.

MR. F. ST. GEORGE MIVART held an inquiry at the Widnes town hall, on behalf of the Local Government Board, into the application of the Town Council for sanction to borrow 675% for the purchase of certain property on the Widnes Promenade for the purpose of extending the accident hospital. There was no opposition. The town clerk (Mr. Oppenheim) said the property proposed to be acquired was Nos. 5 and 6 Terrace Road. It immediately adjoins the existing hospital, which was situated practically in the middle of a comparatively large estate belonging to the Corporation which formed the West Bank Promenade, the site of the hospital and the Victoria Promenade, which was constructed to commemorate the Diamond Jubilee of Her late Majesty Queen Victoria.

MAJOR J. STEWART, R.E., Local Government inspector, recently held an inquiry at Altrincham into an application for sanction to borrow 3,716% for the purchase of slaughter-houses and land at Hale Moss and the erection of additional slaughter-houses and refuse-destructors, also 800% for a scheme for supplying water for public baths and street watering. Mr. J. G. Whyatt, clerk to the Council, laid before the inspector particulars of the present indebtedness and also the rapidly increasing population of the district, showing the urgent necessity for carrying out the object sought by the inquiry. In opposition to the slaughter-houses and destructor scheme the clerk to the Hale Urban Council said that they had

no objection to the slaughter-houses and destructor being placed on the site first chosen in Altrincham, but they strongly objected to their being placed on the Hale portion. Mr. Crooks, chairman of the sanitary committee, said the Altrincham Council had the intention of putting the destructor on the Hale side. The inspector said the result of the inquiry would be reported in due course.

MR. ALDERMAN SHAW laid the foundation-stone on the 17th inst. of a new fire station for the borough of Salford, which is to be erected in Albion Place, The Crescent, during the next year. It will be situated right in the heart of the borough, and in whatever direction a fire takes place the drive will be downhill. The site includes 5,595 square yards, of which 2,700 are leased from the Booth charity for 999 years at a rent of 110% a year, and the rest is freehold. The cost of the building, including the other portion of the site referred to, will be about 25,000/. It will provide accommodation for seventeen officers and men, with their families, and for seventeen single men if required. There is also additional space for the erection of further housing accommodation. In the new station there will be accommodation for four horse machines fully manned, which, it is calculated, will be ready to turn out simultaneously in 15 seconds.

THE foundation-stone was laid on the 25th ult. of new schools which are being erected at a cost of 5,000% at Far Forest, Worcestershire. The site is an ideal one on the elevated land in the New Road, commanding fine views of the surrounding landscape. It measures about two acres, but a portion of the land will be reserved. The schools and house are being erected with red Staffordshire bricks, and will be roofed with Lewis's Cannock tiles. The gables will be relieved by half-timbered work, and there will be a handsome bell turret. The main building will consist of a mixed school for 100 children. The central hall will measure 48 feet by 24 feet 6 inches. This will be divided by a patent movable glass screen. There will be two large classrooms, with separate cloak-room and lavatory accommodation. The infant school will be 25 feet by 22 feet, with a separate entrance and cloak-room. The whole of the floors will be laid with wooden blocks. To each section there will be a separate playground, and covered play-sheds will also be provided for the wet weather. The buildings will be heated by hot water throughout, the infant schoolroom being also provided with an open fire. The heating vault will be beneath the infant school. The teacher's

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house will be a very substantial and roomy building, and as a whole the block will present a handsome appearance. Mr. J. Pritchard, of Kidderminster, is the architect, Messrs. Dorset & Co., of Cradley, the contractors, and it is expected that the work will be completed next spring.

AN influential gathering of those interested in the promotion of the public health by means of good plumbing was held on the 29th ult. at the Fishmongers' Hall, under the auspices of the Worshipful Company of Plumbers. Mr. Bailie Crawford, of Glasgow, the warden of the Company presided, and among those present were Sir James Crichton Browne, Dr. Whitelegge (chief inspector of factories), Mr. Shirley Murphy, Professor Armstrong (of the City and Guilds of London Institute), Mr. L. Gomme (clerk to the London County Council), and Mr. R. J. Coles (clerk to the Plumbers' Company). Referring to the efforts of the medical profession to destroy the tuberculosis bacillus, Sir James Crichton Browne reminded those present that bad plumbing, damp houses and mildew were active agents in the spread of the dread disease.

THE members of the various businesses connected with the building trades of Harrogate and district have secured conveniently situated rooms in the Central Arcade, Chapel Street, on a lease, and have established a building trades exchange and club. One of the principal objects has been to have a suitable meeting-place for the members to have business and social intercourse, and the club is to be run on similar lines to the one at Halifax. The suite includes large billiard-room, smoke-room, reading and committee-rooms, and stewards' rooms. The capital is 1,000l., divided into 1,000 shares of 1l. each; each member will be a shareholder, but no member is to hold more than twenty shares. About half the shares had been taken up by Saturday. Mr. Riley Fortune (president of the Harrogate and District Builders' Association) presided, and the mayor (Alderman D. Simpson) in an appropriate speech declared the premises open. A smoking concert followed.

NEWGATE PRISON.

WITH the demolition of Newgate prison it became necessary to erect a suitable building for the reception of prisoners awaiting trial, which, while fulfilling a temporary purpose, would nevertheless be strong, fireproof and soundproof, and, of equal

importance, one that could be speedily erected, the time allotted in which it was to be completed and handed over to the authorities ready for occupation being the short period of three months.

The system of construction by means of patent dovetailed corrugated metal sheeting introduced by the Fireproof Partition Syndicate was selected, and on the vacant site between the present building and the Old Bailey courthouse a temporary Newgate is rapidly being constructed by them. We give some interesting illustrations showing the work in progress, but before further referring to them we may with advantage remind our readers of some of the special features of this system briefly, as we have on previous occasions fully described it, and pointed out the numerous advantages derived from its adoption.

By special machinery a patent dovetail corrugation is given to the metal sheets, imparting to them great strength, and providing a perfect double key for the plaster, which requires no support to keep it in position while being applied.

When used to form a fireproof partition a T iron is fixed across the ceiling, from this H-iron standards are fixed at suitable distances, through which the sheets are brought to the floor level, where channel iron shoes keep them rigid and in position. In the wall a wall channel is placed to receive one end of the sheet, the other being held in position by the H-iron standard; the next sheet is held by this and the next standard, and this process is continued until the last sheet is secured in the opposite wall channel at the other end of the partition, and are then ready to receive a plastic material which may be applied to both sides of the sheets at the same time. The partition when finished is from 2 inches in thickness, according as may be required, and has been proved after severe tests to be fireproof as well as sound, damp and vermin proof. Should it be desired that wood skirting be fixed to one or both sides of the partition, it can be nailed direct to the partition, or wood fillets are placed in a few of the dovetail corrugations before plastering, and to these the skirting is fixed by screws or nails.

For fireproof floors the ends of the corrugated sheets are fixed on the inside of the lower flange of the steel floor joists, and may be bent or arched to admit of air space between the concrete floor and the ceiling below, or placed straight from joist to joist. When a suspended ceiling is required, sheets are fixed into H-iron bars secured to the floor joists by a patent clip suspender, and give a perfect key for plastering which acts as a protection to the bottom flanges of the floor joists.

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sheets unplastered, forming the cells and roof with roof lights, and plainly shows the method of fixing. No. 2 gives a view of the roof, showing the sheets covered with plastic material, through which can be seen the doors and windows of the cells.



FIG. 1.

The illustration, No. 1, is a view of a corridor in the female wing of temporary Newgate, showing the dovetailed corrugated

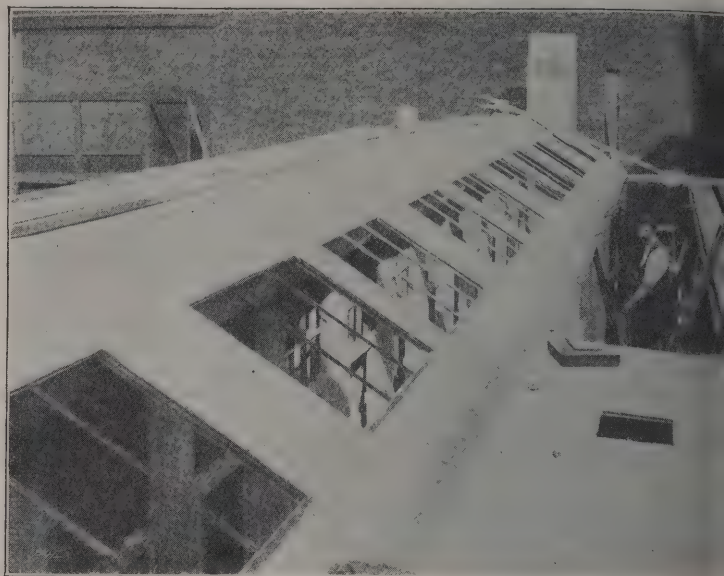


FIG. 2.

In the male section there are eighty-eight cells, the building being of two storeys, constructed entirely on the above systems by the Fireproof Partition Syndicate, Ltd., whose address is at 10 York Buildings, Adelphi, W.C., and who have in hand, in addition to this, numerous other contracts, as will be gathered from the following list of buildings either recently completed or in course of construction. Amongst hospitals are Charing Cross, London Hospital, Netley, Richmond Isolation Hospital, Chester Infirmary, &c.; Tooting Bec, St. Albans, Brentwood and Fulbourne Asylums; Westminster Town Hall, Prince of Wales, Comedy, Vaudeville, Strand, Avenue and Adelphi Theatres, also breweries, barracks, factories, banks, clubs, &c.

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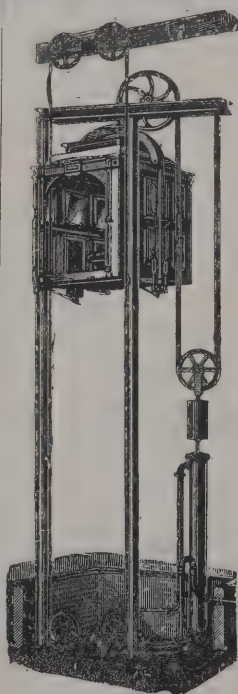
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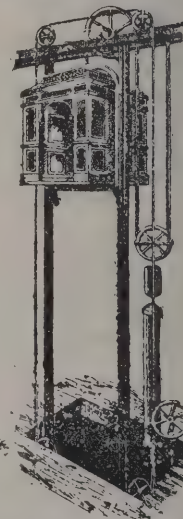
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**MUNICIPAL HOUSE BUILDING IN GLASGOW.**

IN one of the remarkable articles on "Municipal Socialism" in the *Times* are the following remarks about the Glasgow Corporation's experiments in building:—

Still another form of enterprise on which the rulers of Glasgow pride themselves is represented by their adventure into the domain of municipal house-building. Under the Glasgow Improvements Act of 1866 the City Corporation acquired possession of slum areas extending over 88 acres, and occupied by a population of 51,000 persons, the cost of the scheduled properties being about 2,000,000*l.* Clearances were effected, new streets were formed, and it was hoped that the vacant land would be taken up by builders and turned to account by them. A substantial portion of the land was disposed of to builders on chief rent or feu duty of a capital value of about 300,000*l.* But the charges imposed by the Corporation were very high, and the fact that such extensive clearances had been made, and the former population scattered to other districts, led to there being only a limited demand for shops and houses at that time, so that several of the builders lost very heavily by their speculation. Others were deterred from running the risk of sharing their experiences; and, as the Corporation declined to reduce the charges for sites, so as to give to the builders a reasonable chance of a fair return on outlay, the remainder of the land was left on their hands until 1888, when they resolved to carry out a building scheme on their own account. They then proceeded to put up a considerable number of shops and dwelling-houses, seven large lodging-houses, a laundry and a family home, the total value of the property thus erected by them being about 1,000,000*l.* To meet the cost of carrying out their improvement scheme the Corporation had levied on the rental value of the city a rate which was fixed at sixpence in the *£* for the first year, fourpence in the *£* for the next four years, with subsequent reductions until one penny in the *£* was reached, at which figure it stood until it was finally abandoned in 1888. The charge on the rates thus extended over a period of more than twenty years, and the total amount actually contributed by the ratepayers has been put at 600,000*l.*

In return for this expenditure the city gained what was undoubtedly a very great improvement in the disappearance of many narrow streets, filthy courts and insanitary and over-

crowded dwellings, and the substitution for them of new and broadened thoroughfares, with healthy dwellings, shops, &c. But there was no suggestion of any attempt to rehouse the people who had been ejected from the demolished areas, the new dwellings being, as a rule, such as only well-to-do artisans, Corporation officials, clerks, shopkeepers or professional men could afford to rent. It is said there are even members of the Town Council itself living in some of the municipal dwellings. The 51,000 persons dishoused from the insanitary areas were mostly left to migrate into other districts of the city.

As regards the Corporation lodging-houses, it is true that at the time they were started they were a distinct advance on anything that private enterprise had done on these lines; but private enterprise soon began to provide lodging-houses fully equal to those of the Corporation, and there was then no need for the latter to continue the business. It is equally true that there is an increasing demand for accommodation in the Corporation lodging-houses—especially on the part of men who regard them as municipal houses of refuge from wives whom they wish to leave, and who give false names so as to escape detection when their wives inquire for them; or of other men who, earning good wages, want to reduce the cost of living to a minimum so that they can spend as much as possible in drink. There is good reason to fear that the so-called housing problem in Glasgow is largely a drink problem. In a certain condemned area in Glasgow I found an intelligent woman, evidently of a respectable type, but dressed in rags, having a blackened eye and a bruise on the forehead, and accompanied by four children who looked a very picture of misery and neglect. To the question, "Where will you go when you have to leave here?" the woman's reply was, "Oh, we should be all right if he would only keep off the drink. He earned 4*s.* 6*d.* yesterday, but spent 4*s.* 2*d.* on drink, and brought me 4*d.* to keep the house on, and he knocked me about, as you see."

The "family home" set up by the Corporation was intended originally for both widowers and widows with families, the idea being that the children could be cared for there by responsible persons while the parent went out to work; but developments took place which were not in the municipal programme, and the widows were got rid of, accommodation being now available only for widowers. But at no time, it is said, has the home been more than three parts full; and whether a municipality should devote the public funds to any such enterprise at all is open to question.

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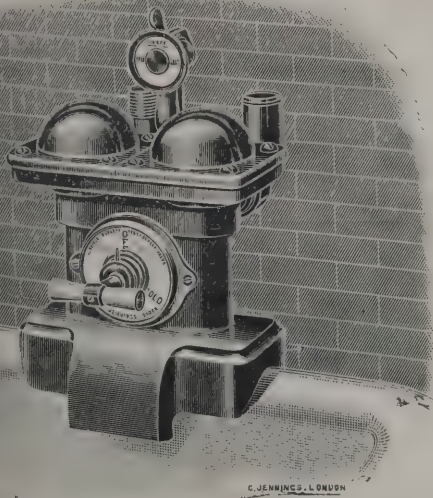
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So serious was the state of things brought about by the Corporation's pulling down the poorest class of houses without making any provision for the poorest class of people that in 1890 the Glasgow Workmen's Dwellings Company, Ltd., was formed by certain prominent citizens, with a capital of about 40,000*l.*, not with the idea of curing the evil with such very modest means, but in the hope of affording some "object-lessons" alike in the building of "simple, sound houses," capable of being let at minimum rents, and in improving the structure and the management of dilapidated slums, so as to convert them into habitable and remunerative dwellings, instead of demolishing them altogether. It was thought that if these object-lessons were a success the city authorities and other agencies would be encouraged to follow the example set. The company thus played the rôle of pioneers in Glasgow, for the Corporation, be it remembered, had up to then made virtually no attempt to house the poor, and had dealt only with just the cream of the artisan classes. In the course of ten years the company invested the whole of its capital in erecting six large blocks of new dwellings on two sites, one in the north and the other in the east of the city, and in purchasing 26 blocks or tenements of "neglected and dilapidated houses, hotbeds of disease and crime," which either have been, or are in process of being, thoroughly renovated and converted into decent homes. But it seems that for some years after the completion of the first block of new tenements the company's building operations were suspended, "largely," says their secretary in some "Notes" published by him on these "Experiments in Housing," "from uncertainty as to the policy of the Corporation in providing much-needed housing accommodation for the struggling labouring class." On this same point Dr. Smart, Professor of Political Economy in the University of Glasgow, in a lecture on "The Housing Problem and the Municipality," after describing what had been done by the company of which he is a member, added:—

"And all this without any help whatever from the Corporation, indeed, with not a little of ignorant if not ill-natured obstruction. I say this perfectly frankly. It only illustrates the tendency of a great successful municipality not to help, but rather to hinder, any private agency which presumes to do the same work as itself."

Meanwhile, that is to say in 1897, the Glasgow Corporation obtained a further Act which authorised them to acquire and deal with six other insanitary areas, the condition of which had been rendered so much worse as the outcome of the policy

already carried out, that they were undoubtedly a source of danger to the public health. It was held, however, that the sites thus to be cleared were too valuable to be utilised again for housing purposes; and the Corporation were further empowered to acquire 25 acres of land elsewhere, either within the city or within a radius of half a mile of the boundary, for dwellings for the poorer classes. The Corporation were also authorised to borrow 560,000*l.*, to be repaid within sixty years, and to levy a rate of 1*d.* in the pound, to enable them to carry the Act into effect. Yet here again there has been no attempt on the part of the Corporation to rehouse the particular classes ejected from the fresh lot of slums. They even successfully petitioned the Secretary for Scotland to be relieved of the responsibility of making any such provision, representing that there was already ample accommodation in the immediate neighbourhood of the areas in question. So where the slums had stood before the Corporation erected five and six storey warehouses, workshops and other commercial buildings; while municipal dwellings, suitable only for people earning wages of not less than from 22*s.* to 26*s.* a week, are being put up at Alexandra Park, which, as Professor Smart has pointed out, "is a mile and a half from any centre of industry and from the present slums, and the site selected is about seven minutes' walk from the car terminus." It is, indeed," he adds, "among green fields; but it is questionable whether green fields are as attractive as they should be to the class in question. Cynical people suggest that the new gasworks are being built in the vicinity, and that the need of accommodating Corporation employes may have something to do with the new tenements." The profits realised by the Corporation from the commercial buildings on the areas cleared within the city are to be applied, as far as necessary, to the relief of the dwellings beyond the city boundaries, the idea being that it will thus be possible to accommodate the tenants at cost price, or even less, without any charge falling directly on the rates. A further reduction in the cost has been effected through building on some surplus land acquired from the parks and cleansing departments, which have not wanted it for their special purposes. One sees, therefore, that the tenants of these dwellings will well deserve to rank as a privileged class; and that should be doubly the case if, besides being allowed to occupy dwellings erected in these specially favourable circumstances, they should indeed be mostly municipal employes, engaged at the neighbouring gasworks.

In any case the direct result of the policy carried out by the

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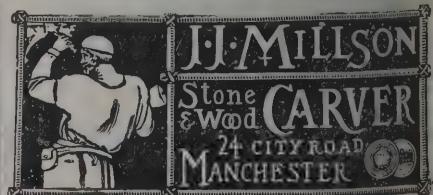
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Glasgow Corporation in regard to the housing question has been to check the further development of local private enterprise along the lines laid down by the Workmen's Dwellings Company. Professor Smart says of that company:—

"It has built to the limit of its capital. It could raise more capital, or it could start other companies. But it stays its hand for two very good reasons—(1) Because it cannot afford to rent at cost; and (2) because, even if it were willing to, there is no use in private people losing money to do what the Corporation is going to do, presumably without losing money."

The position is the more regrettable because no one who reads Mr. Mann's "Notes" on the operations of the company can fail to be struck with the great amount of good which has been done with such a very modest capital as 40,000*l.*, while still securing a return of 4 per cent. for the shareholders. One feels, indeed, that the Glasgow Workmen's Dwellings Company has really done more in its way towards the solution of the real housing problem than the Glasgow Corporation with all the funds at their command; and there is even the suspicion that the result of municipal policy in Glasgow has been to intensify the housing problem there, rather than to bring about any effectual remedy.

As for the individual builders at Glasgow, apart from the housing companies, their attitude on the question was indicated by a speech delivered at the last annual meeting of the Glasgow Landlords' Association, Ltd., by the president, Mr. W. C. M'Bain, who in the course of his address spoke of the necessity of maintaining their Association strong in membership and funds, so as to "repulse the repeated aggressive attacks by the Corporation," and added:—

"We do not object to the Corporation safeguarding the health and lives of the citizens; and equitable, well-considered schemes for the attainment of that object will meet with no opposition from us. But we do object to the fruits of our industry being filched from us, and to our legally-acquired property being treated as if it belonged to the municipality. House-owning is a business, and people embark in it as they do in railways, collieries and manufacturing—to turn an honest penny and make a living, and not for fun or to afford a target for faddists to shoot at. House-owners receive no favours from the Corporation, and none are asked, but we object to schemes which are founded on the lines of conferring 90 per cent. of the benefits on one class and placing 90 per cent. of the burdens on another."

### A YEAR'S BUILDING IN GLASGOW.

ON Thursday, the 25th ult., Lord Dean of Guild Dr. Robert Gourlay retired from office. The following address was given:—

I have to ask you to bear with me this morning while I, very shortly, go back on the work this Court has done during the past year. I think we may claim it to be a record, for, while on two occasions have the number of linings exceeded those granted this year, the value of those has never been surpassed. Three times in thirty years has the total value of the linings been over 2,000,000*l.* This year they amount to 2,549,698*l.*, or 424,449*l.* above the highest figure hitherto reached, and that was before the extension of the city in 1875-76, and during the boom in everything which preceded the failure of the City of Glasgow Bank. Of the above linings—669 in number—197 are for dwelling-houses and shops, 13 for public buildings, 10 for churches, halls and schools, 166 for warehouses, 244 for alterations and additions, and 39 are for new streets of 11,720 yards in all—equal in length to between 6 and 7 miles, the largest extension that has ever taken place in one year. Of the dwelling-houses, 611 are of one apartment—an increase of 234 as compared with last year, chiefly in the Eastern and St. Rollox districts; 2,420 are of two apartments; 1,527 are of three apartments. Of the three-apartment houses, more than one-half of those over the whole city are in the Queen's Park district, chiefly in Langside.

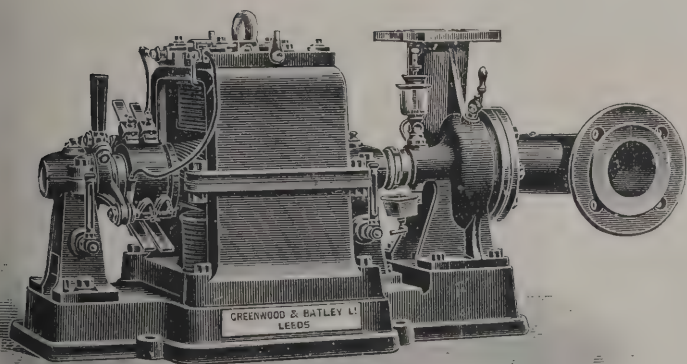
This is a significant fact, and shows that with the great facilities given by our railways and electric trams an increasing number of the well-to-do class are making their abodes in the country and suburbs; 292 are of four apartments, 143 of five and 356 of six. The single-room houses are 11.42 per cent. of the total apartments lined; two room, 45.24 per cent.; three room, 28.54 per cent.; four room, 5.45 per cent.; five room, 2.67 per cent.; and six room, 6.65 per cent. The districts in which the greatest amount of building is going on are Queen's Park, Mary Hill and the Eastern. The linings for houses in the first are 35.09 per cent. of the total; second, 13.38 per cent.; and third, 20.90 per cent. The value of those in Queen's Park is 660,300*l.*; Maryhill, 302,980*l.*; Eastern, 225,040*l.* These three districts represent 1,188,320*l.* of the total value of houses lined, viz. 1,458,710*l.*, as compared with 678,574*l.* in the previous year.

The value of the public buildings, churches, &c., passed by the Court this year was 1,090,988*l.*, as compared with 980,726*l.*

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in that preceding it. These are represented by:—Public buildings, &c., 447,000*l.*; churches, halls and schools, 63,000*l.*; warehouses, stores and workshops, 349,000*l.*; alterations and additions, 230,000*l.* Besides ordinary applications for the erection of buildings, the Court has had during the year to deal with upwards of 100 petitions for the approval of plans of buildings of the warehouse class. The Court has also had to dispose of fifty-seven cases at the instance of the Procurator-Fiscal. These were principally for the inspection and protection of dangerous buildings, the inspection of large buildings and structures, such as churches, schools, grand stands, &c., and for orders on proprietors to repair defective pavements, &c. Several builders were also brought before the Court and fined for deviating from plans passed by the Court, and for allowing houses to be occupied before being certified. Many visitations were also made by the Court during the year, many of these being to inspect the site of buildings proposed to be erected in hollow squares. This is a new duty devolving upon the Court, under the Building Act of 1900, as is also the consideration and disposal of applications for the erection of hoardings or billposting stations. The Buildings Regulation Act of 1900 may not, as yet, be fully understood in all its clauses, but it has at times appeared to the Court that a little more help might have been given it by builders of great experience, their architects and their law agents, if, in their plans, even although it involved a small money loss, they had been a little more liberal in the matter of light and air. They would be benefiting in future years the dwellers around hollow squares and well-lighted back areas. The problem of the housing of the poor is still before us. May we hope that the Commission lately appointed here will be able to settle it in a way which will be a real help to those whom they seek to benefit, and furnish us with model dwellings in which the occupiers will take a pride, and which will be the means of lifting not a few to a higher platform in our social life?

During the year communications were received from the Faculty of Procurators containing certain suggested alterations in the procedure of the Court which the Faculty thought would, if adopted, expedite the business of the Court, and the Court being desirous to meet, as far as possible, the views of the Faculty, have had meetings with deputations from that body at which the suggestions were discussed and considered. One of the points discussed was a suggestion by the Faculty that the roll of cases should be called over at the commencement of the

sitting of the Court, as is done in the Sheriff Small Debt Court, and lining granted in those cases in which the master of works had no objections. Looking, however, to the peculiar character of the Dean of Guild Court, and to the fact that there are very few cases in which adjoining proprietors are not called, and are entitled to be heard, the Court, after careful consideration of the views of the deputation, was of opinion that to adopt the suggestion of the Faculty would neither save the time of the legal profession nor the public, but, on the contrary, would lead to delay and confusion. In this view the deputation acquiesced. The Court, however, thought that, to some extent, time might be saved were a rule passed providing for a longer lapse than at present between the lodging of plans and the day of the Court—say four days longer. This would give the master of works more time to examine plans—which, in consequence of the recent Building Act is very desirable; architects would have an opportunity of amending their plans to give effect to any objections by the master of works, and the legal profession would be able to consult clients, examine titles, &c., thus obviating in many instances a continuation of cases for the production of titles. This suggested alteration was communicated to and considered by a committee of the Faculty, who approved of same. The Court has accordingly resolved, and has to-day enacted, that petitions and plans be lodged on the Tuesday of the week preceding that in which the Court is held, and that the plans shall be examined by the master of works on the succeeding Wednesday and Thursday. On Friday, Saturday and Monday they will lie in the office of the clerk of Court, where they can be seen by anyone interested, and any amendments suggested by the master of works made thereon. The liners' meeting will be held as at present on the Tuesday preceding the Court, and any alterations on plans on the day of the Court, unless of a very trivial character, will not be permitted. The Court has also agreed to adopt a suggestion by the Faculty that the officer of Court number each copy petition served by him with the number that the case stands on the Court roll, and that when calling the case he should also call the agent's name where the petitioner is represented by an agent.

Another point that has been considered was a complaint by the Faculty that house factors and architects were in the habit of preparing petitions and appearing in Court either by themselves or by assistants on behalf of petitioners. The Court is aware that this has been permitted to a certain extent

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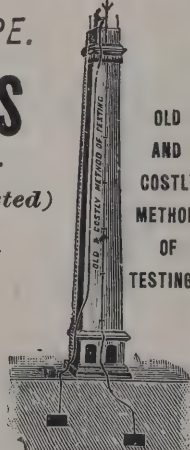
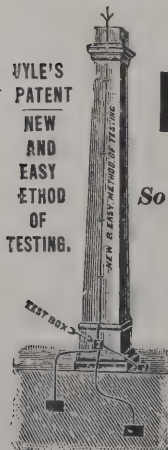
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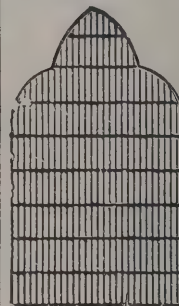
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from time immemorial—but only to a very limited extent in recent years—and while the Court does not feel called upon under present circumstances to pronounce any formal order on the legality of such a practice, it is of opinion that the practice should cease and that only petitioners themselves or their law-agents should appear. Another matter that has engaged the attention of the Court during the year has been the condition of the plans passed by the Court prior to 1885. These plans being public property are very often required to be examined and referred to. Hitherto they have been lying in the basement flat of the City Chambers and no inventory of them has existed. As a consequence much time and labour has been expended in searches, often unsuccessful. This year a complete inventory of these plans so far existing or traceable has been made by Mr. Ramsay and a suitable place in the City Chambers has been granted by the Corporation for their storage and safe keeping. They will in future be under the custody of the clerk of Court, and it is hoped that the labour expended in arranging the plans and preparing the inventory will prove of public advantage.

### SOCIETY OF ENGINEERS.

A VISIT was made by the president, Mr. Percy Griffith, and members of Society of Engineers on Wednesday, September 24, to the engineering works of Joseph Baker & Sons, Ltd., and the machine works of the Wicks Rotary Type-casting Company, both of which establishments are situate in Hythe Road, Willesden Junction.

These works are situated in Hythe Road, Willesden Junction, upon a branch of the Grand Junction Canal, which connects them directly with the Thames. They are, moreover, within a few minutes of the London and North-Western and Great Western Railway Companies' lines. The company have been in their present premises for about twelve years, and their shops are well equipped with modern tools and machinery by English and American makers. The manufactures carried on are chiefly machines for the bread, biscuit, chocolate and confectionery trades, also garbage destructors and several other kinds of industrial machinery. The first, or old, building is 270 feet in length, and is built along the banks of the canal. At one end of this building are situated the forge and the coppersmiths' and boiler-makers' shops. The central portion of the building is the machine and fitting shop. The company have adopted the

principle of keeping their machine tools and fitters' benches as near together as possible, in order to avoid the necessity of removing the parts of machines from one portion of the shop to another. This is a one-storey building, and at the further end is the packing and despatching department, which adjoins the wharf. On the further side of the wharf is the timber store and a shed for an experimental tram. The cast-iron and tool stores are arranged along one side of the main building.

The new shop is 230 feet long and has a gallery about 20 feet wide running round three sides of the building. The centre of this building is used as a fitting and erecting shop, the machines being ranged in double row against the sides of the building. In this shop there are several large vertical lathes and a large assortment of modern tools by the best makers. In the gallery are constructed the lighter machines, biscuit cutters, engraved wafer plates, speed reducing gears and the like.

The woodworking building is situated on the west side of the company's premises and is 82 feet long by 52 feet wide; it is fitted with circular saws, planing machines and various other woodworking machinery. The upper storey is used as the patternmakers' shop, and beyond which is the drawing office and photographic room. In the yard are the iron and timber stores, the centre of the yard being used as an erecting ground for travelling ovens and garbage destructor furnaces.

### AN IMPORTANT MAIN DRAINAGE SCHEME FOR GLASGOW.

In connection with the inspection of the Western Drainage Works on Wednesday, the 25th ult., by the members of the Glasgow Corporation, Mr. A. B. McDonald, city engineer, prepared the following notes descriptive of the important scheme which the Corporation has now in hand:—

The main drainage scheme for the collection and treatment of the sewage of Glasgow and the adjacent local authorities was authorised by special statutes in 1891, 1896, 1898 and 1901. The territory included stretches along both sides of the river Clyde for a distance of about fifteen miles, the superficial extent of the drainage area being thirty-nine square miles. This territory is likely to be increased by the inclusion of areas belonging to outlying local authorities.

The drainage area is divided into three sections, each

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distinct from the others, with separate works for the disposal of their sewage.

The first of these, authorised in 1891, and doubled in extent in 1901, comprises about eleven square miles, one-half being within the city, and the remainder in the landward district of the county of Lanark.

The works for the treatment and disposal of the sewage of this area are situated at Dalmarnock, and the drainage is collected and conveyed there by a main sewer constructed at the cost of the Caledonian Railway Company.

The second section was authorised in 1896, and includes the municipal area on the north side of the river, not provided for in 1891, the burghs of Partick and Clydebank and intervening parts of the counties of Renfrew and Dumbarton, the whole extent being fourteen square miles.

The works for the disposal of the sewage derived from this area are in process of construction on the river bank at Dalmuir, about seven miles below Glasgow.

The third section, authorised in 1898, comprises the whole of the municipal area on the south bank of the river, the burghs of Rutherglen, Pollokshaws, Kinning Park and Govan, as well as various residential and rural districts in the counties of Lanark and Renfrew. The extent of this section is fourteen square miles, and it may be enlarged by the inclusion of the burghs of Paisley and Renfrew.

The works for the disposal of the sewage of this area will be situated on the river bank at Braehead, about one mile eastward from Renfrew.

The collecting and intercepting sewers which connect with the Dalmarnock works have all been constructed and in successful operation since May, 1894.

The daily volume of dry-weather sewage treated there at the present time is about 16,000,000 gallons, which will ultimately be increased to 20,000,000 gallons.

The volume of dry-weather sewage to be ultimately treated at Dalmuir is 49,000,000 gallons, and the corresponding volume at Braehead will be 48,000,000 gallons.

For the collection and disposal of the 97,000,000 gallons of sewage within this divided territory there will be constructed 30 miles of sewers, varying in size from 2 feet 6 inches in diameter to 10 feet, the separate capacities of which have been calculated to discharge, in addition to the daily dry-weather flow of sewage, an amount of rainfall equivalent to one-quarter of an inch per day, or 214,000,000 gallons of combined discharge.

The principal features of the western scheme are the construction of an outfall sewer to convey the drainage of the higher levels of Glasgow and Partick to the works at Dalmuir, the construction of an intercepting sewer to collect the drainage of the lower levels of the city, the construction of an intercepting sewer to collect the drainage of the lower levels of the burgh of Partick, and a third intercepting sewer to convey to the Dalmuir works the drainage of the burgh of Clydebank.

The Glasgow and Partick intercepting sewers will be pumped into the outfall sewer at Partick Bridge, the lift being 37 feet. The pumping engines, three in number, are of the triple-expansion type, with plunger pumps, each being capable of raising 11,250 gallons per minute, or 16,000,000 gallons per day. Steam is supplied to these engines by four boilers, working at a pressure of 160 lbs. per square inch. The Clydebank intercepting sewer will be pumped at Dalmuir, the lift being 21 feet. The smaller engines at Dalmuir will be of the centrifugal type, and the power for the treatment plant will be transmitted by electricity.

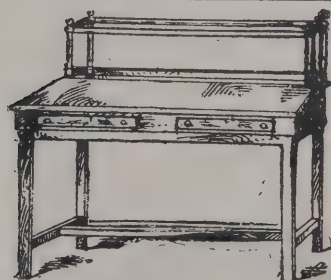
Rather more than one-half of the total sewage of the western scheme will be carried to the Dalmuir works, where the whole contents of the outfall sewer will be delivered into the precipitation tanks above tidal level. The purified effluent from the tanks will pass by gravitation over a discharge weir into the river, and the sludge will be pumped into specially constructed barges and conveyed to sea.

On the south bank of the river the surface levels of the drainage area are less favourable for the conveyance of sewage and rainfall by gravitation than they are on the north side, dealing with the figures that represent the distribution of population at the present time, although the future development of the territory included will bring the volumes conveyed by the gravitation and pumped sewers into less disparity. A storm-water relief sewer will require to be constructed in Kingston district to discharge the rainfall carried by the outfall sewer.

The sewers to be constructed on the south side of the river follow for the greater part of their course the line of public streets and roads. There will be a pumping station at Pollokshields or Kinning Park, where the low-level sewage will be raised 35 feet, and another at Braehead, where the lift is to be 21 feet.

The sewage of Paisley and Renfrew can be brought to the works in low-level sewers, and will require to be pumped.

The works for the treatment of the Southern sewage at Braehead will, like those of Dalmuir, have the great advantage



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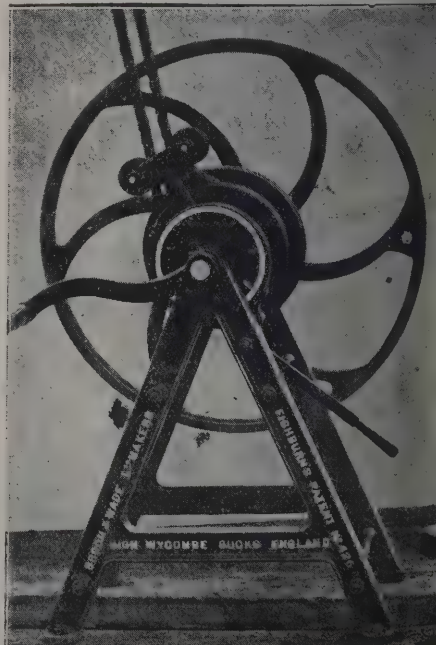
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of river frontage, with every facility of water carriage for receiving and despatching materials.

The system of sewage treatment which is now adopted at Dalmarnock is chemical precipitation by means of under-surface continuous flow. The drainage received at the works is of a complex and specially intractable character, consisting for the most part of industrial refuse, charged with suspended matters that vary from 20 to 1,000 grains per gallon. The treatment of such sewage is a matter of no ordinary difficulty, and the proportion of the chemical ingredients undergoes frequent change during the day.

After careful deliberation and much patient investigation on the part of the sewage committee and their advisers, it was resolved to adopt at Dalnuir and Braehead the same method of sewage treatment as that which has for the last seven years been in successful use at Dalmarnock, with this exception, that the sludge presses which, by the compulsion of the situation of Dalmarnock works, have been employed there are to be dispensed with, and the liquid sludge, as already explained, carried out to sea.

The most diligent inquiry regarding the methods adopted by other authorities in England failed to provide the sewage committee with any reason to justify them departing from what they regard as a securely ascertained and efficient system of sewage precipitation and disposal.

The working result of the sewage treatment in daily practice at Dalmarnock obliterates every trace of suspended matter and effects 30 per cent of chemical purification, calculated on the basis of oxygen absorbed in four hours at 27 degs. centigrade. The result may leave something to be desired, but it must be borne in mind that economy imposes a limit on achievement in this direction. The quantity of sewage disposed of at Dalmarnock at the present time is, as we have seen, about 16,000,000 gallons, and it is discharged into a tidal stream of fifty-fold volume.

It has not yet been ascertained by any scientific authority what degree of saturation is needed to secure innocuous conditions in the admission of sewage effluent into flowing water, but it may be safely asserted that there is in this case as near an approach to the complete elimination of every element of objection as could be wished for. Further down the river, at Braehead and at Dalnuir, the 97,000,000 gallons of purified sewage will come in contact with 3,000,000,000 gallons of tidal water, and may with safety be left to natural agencies for their further improvement, the more especially as the quality of

sewage to be dealt with hereafter on these lower reaches of the river will be of a simpler character than that which is presently treated at Dalmarnock, and consequently likely to yield an effluent of a better character.

There is the greater reason to expect this, as the form and dimensions of the precipitating plant at Dalnuir and Braehead will be more effective than the original installation at Dalmarnock.

The works there were designed by the late Mr. G. V. Alsing, and were justly regarded at the time of their construction as creditable in the highest degree to their designer, embodying, as they then did, the latest results of experience and scientific research. They were arranged for intermittent precipitation, and worked in connection with coke filters, through which the sewage effluent was passed on its way to the river.

More recently it has been found desirable to extend and convert the Dalmarnock works; the precipitation tanks are now worked in continuous flow, and the use of the filters has been abandoned, as it was found that the process deteriorated the effluent instead of improving it.

The precipitation tanks in course of construction at Dalnuir, which are to be worked on the system of under-surface continuous flow, are more favourably situated than those at Dalmarnock, each being about 750 feet in length, thus allowing opportunity for more complete precipitation than is effected in the shorter tanks at the Dalmarnock works, and effecting a saving in the reduced proportion of chemical agents required for the process.

The works authorised under the statutes of 1896 and 1898 include, as already stated, thirty miles of outfall and intercepting sewers, as well as four separate pumping stations, and two sewage works for the treatment of the collected drainage, one at Dalnuir, the other at Braehead.

The work that has been completed up to the present time represents only a small proportion of the whole. All the working drawings, details and specifications of the scheme authorised in 1896 were matured not long after the statute received the royal assent, and part of the work was commenced in the early months of 1899.

The other sections of the western undertaking might have been proceeded with at the same time, and in all likelihood would have been completed before this date had not the Town Council at the outbreak of the South African war directed that capital expenditure on works should be suspended owing to

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the advanced rates of interest on money. Unfortunately, however, trade prices have so increased that work then prepared for has been resumed at a cost greatly exceeding the tenders obtained by the sewage committee at that period.

During the course of next year it is hoped that the work on the northern bank of the river will be so far advanced as to permit the greater part of the sewage derived from the western area being purified, and a corresponding improvement in the condition of the river brought about.

The works on the southern bank, the details of which have already been elaborated, will no doubt be pushed forward by the committee, although a longer time must necessarily elapse before their completion can be looked for.

### ELECTRIC LIGHT IN DUBLIN.

THE Irish section of the Institute of Electrical Engineers visited and inspected on Saturday last the new electric lighting buildings at present in process of erection at what was formerly known as the Pigeon House Fort. The new works are intended to supersede those at present in existence in Fleet Street, which have been found inadequate to meet the lighting requirements of the city. The site for the new station was acquired by the contractors on May 1, 1901. Considerable time was, however, occupied in pulling down the old buildings, which for many years had stood thereon, and excavating for the foundations, and it was not till some months had elapsed that the actual work of building was commenced. In January of the present year the erection of the chimney shaft was begun, and it has just been completed. It is 186 feet in height—about 50 feet higher than Nelson's Pillar—and its foundations are nearly 35 feet in depth. The main building, which measures 182 feet in length, 140 feet in depth and 60 feet high, stands on the eastern side of the new harbour. It is erected on massive foundations, averaging 10 feet in width, and the walls are exceptionally strong and substantial. Like the chimney shaft all the walls are built of Irish bricks by Dublin workmen. The boiler-house is 40 feet from the quay front of the harbour. The coal required for the works will be lifted from vessels lying alongside the quay opposite the station by a travelling crane and grab directly out of the vessels into hoppers in front of the boiler-house, and will be delivered into a bucket-conveyor running underneath the whole length of the boiler-house. It will be weighed automatically and conveyed into

the store at the end of the main building, and from thence it will be delivered to the hoppers of the mechanical stokers in connection with the boilers. By this arrangement the coal will be delivered from the vessel to the furnace without being touched by hand at an estimated cost of less than 2d per ton. The boiler-house is 180 feet in length and 53 feet wide. It will contain four Lancashire boilers and four Babcock boilers. These will be supplied by a pump-house. The feed proper will consist of the condensed steam from the condensers, supplemented by Vartry water. The supply of water required for condensing the exhaust steam will be taken direct from the harbour by an elaborate system of piping and wells situated 23 feet below the level of the boiler-house. The engine house, a bright cheerful building, is 150 feet in length by 50 in width. To reduce vibration to the lowest minimum the engines will be placed on foundations consisting of concrete 14 feet in depth. The plant will consist for the present of three-phase alternators, which have been built at the Geilikon works, Switzerland, and will be driven by four Duncan Stewart engines, two sets of 1,000 kilowatts each and the remaining two 500 kilowatts each. The engines will be capable of developing a combined total of nearly 6,000 horse-power. Overlooking the engine-room there is a switchboard-room adjoining the offices, stores, workshops, mess-room, &c. Nearly all the plant required at present is ready for erection. The generating plant is stored in the old submarine mining station, two of the boilers are already at the premises, the switch-boards will be delivered within the next fortnight, and the remaining portions of the plant are almost completed. The whole will be erected immediately after the roofing of the building has been finished. A current of 5,000 volts pressure will be generated at the station and transmitted without being reduced in strength to the distributing centre, which will be the existing Fleet Street station. From this centre high pressure cables will radiate to twenty district transformer sub-stations, in different parts of the city. At each of these sub-stations the current will be reduced to the pressure at which it will be supplied to private consumers, viz. 200 volts for lighting and 340 for power purposes. The system will cover 80 miles of street frontage, and there will be about 150 miles of cables. Of these over 100 miles have already been laid. For the carrying-out of the scheme with certain extras the Corporation has already sanctioned an outlay of 265,000l., which includes the liability incurred for enlarging the plant and rendering it capable of supplying the outlying district of Clontarf.

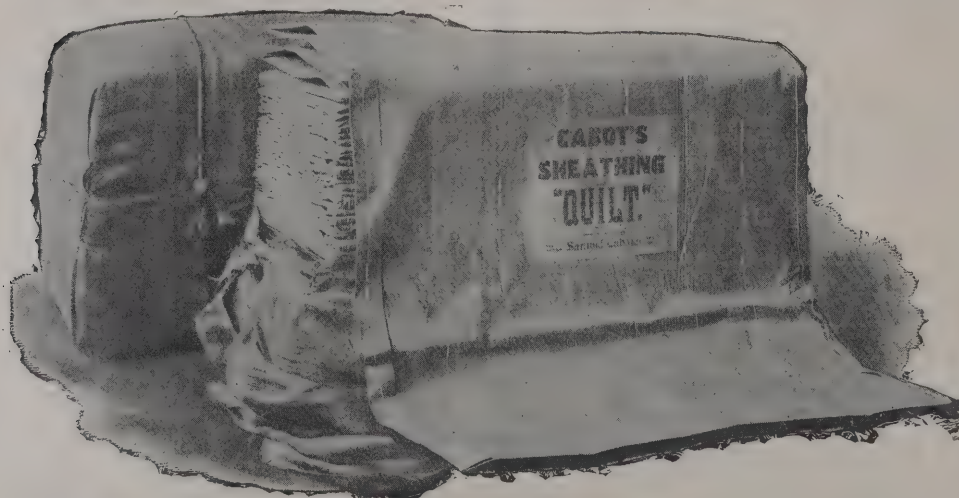
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# The Architect.

## THE WEEK.

THE failure to pass the plans of the Brighton Electric Railway before the Examiner on Standing Orders has not deterred a syndicate from renewing the effort. Mr. F. H. CHEESEWRIGHT, the engineer-in-chief, says:—"The whole length of the line will be under 47 miles. The gauge will be standard gauge, with a central rail to transmit the electric current. The curves will be few and of large radii, the greatest not more than 1 in 120. There are no engineering difficulties whatever in the project. It is proposed that the railway shall be in tunnel about 13 miles of the total length, and that such tunnel shall be constructed 27 feet wide in the clear from side to side; this will allow room for workmen should two trains be in the tunnel at the same time, as well as avoid the train diminishing speed through the resistance of the air, and likewise secure perfect ventilation." His associate, Mr. ROBERT HAMMOND, believes it would be quite possible, with due regard to safety, to run trains at a speed of 100 miles per hour, but such a rate of speed would involve very heavy working expenses, and taking into account the question of economy, he recommends that the normal speed should be 75 miles per hour. The line could be constructed in about three years. Meanwhile the duty of the engineers is to make arrangements that will prevent a repetition of the gross carelessness which was manifested in the plans prepared a year ago. The country between London and Brighton is not difficult for such a survey as suffices for Parliamentary plans, and it will be discreditable if similar absurdities to those which excited laughter in the Examiner's office are again exhibited.

AMONG the residences in Versailles one of the most interesting is known as the Pavillon de Madame. It was constructed in 1780 for the Princess JOSÉPHINE-LOUISE of Savoy, who was married to the Count of PROVENCE, one of the grandsons of LOUIS XV., and afterwards LOUIS XVIII. He was styled Monsieur during his brother's lifetime, and his wife was therefore Madame. The building was in the fashion of the time when everything seemed favourable to royalty in France and a French Revolution was thought to be an impossibility. The house is accordingly decorated in a charming manner, with wall and ceiling paintings of great merit. For some years past it has been possessed by M. CHAUCHARD, the founder and for several years the chief proprietor of the Louvre, the great warehouse which every Parisian woman from the highest to the lowest is likely to have patronised. He now owns the most valuable collection of paintings in Paris, one of his treasures being MILLET's *Angelus*. M. CHAUCHARD does not forget the source of his success and the representatives of the men who helped to make him a millionaire. He has made over the beautiful Pavillon de Madame in order that it may become a house of retreat for old employés. In such a place men who have performed their task may find well-merited repose.

THE old Sardinian Chapel, which was approached from Lincoln's Inn Fields by an archway which was not graceful, was better known of late years as the church of St. Deselm and St. Cecilia. The origin of the first name was not manifest to all. The kingdom of Sardinia no longer exists and cannot be represented in London by an ambassador. But prior to the establishment of the kingdom of Italy the Sardinian Ambassador found it advantageous to seek an official residence in a different quarter of London. The law of nations an ambassador's house and any premises attached to it are held to be sacred, and at a time when his creed was prohibited by law a Roman Catholic could worship in the chapel of the Sardinian embassy as in similar buildings elsewhere. It was too big to be considered a private chapel, and it is doubtful whether there were ever enough Sardinians in London to fill it. Within and without it was suggestive of being raised quickly and inexpensively. The people who were antagonistic to the services held in it respected it in the most bigoted times. It was not until the Gordon Riots in the eighteenth century that vengeance was wreaked upon

the building. But as the ambassador's house was not respected, and TOWNLEY'S Greek sculptures were treated as if they were aids to idolatry, it was evident unusual excitement prevailed. All but the walls were destroyed. With such a precedent it would be judged impolitic to restore the building in a costly manner. The church had a history of about 250 years. It is now to pass away as an obstacle to the Strand improvement scheme, and a large sum will have to be paid for the right to demolish it. But at no time could it be said to be a credit to Italian architects.

THE accident which occurred in the Crewe Station last August suggests the necessity of supplanting cast-iron columns in railway stations and introducing others of steel or rolled iron. That, no doubt, would be an expensive improvement, but the contingencies arising from an increased traffic are almost enough to make it compulsory. At Crewe the down passenger train to Manchester was crossing at the north end of the station from the down platform line to the down main line. The vehicles in the rear were run into by two empty coaches, which had been propelled along the down main line foul of the crossing. One of the carriages in its derailment struck against two cast-iron columns supporting the station roof, and these two columns breaking, a portion of the roof about 25 yards in length fell down on to the permanent-way and the rear portion of the train. One of the roof girders in its fall crashed through the roof of one of the saloons, but fortunately both the saloons were empty, and no personal injuries were sustained by either passengers or railway officials. It is easy to imagine the loss of life which must have followed under circumstances less favourable. We suppose the coaches were moving from the force of the momentum they had received from an engine, and were consequently without a guard or guide to control their movements. The Board of Trade inspector says that the erection of cast iron pillars on the permanent-way between the lines of rails was a very undesirable arrangement, which is never used at the present day. It is true that in the latest railway stations steel is substituted for cast-iron, but several stations remain in which cast-iron columns exist, and which the impact of a few carriages is sufficient to overthrow, and to bring down a part if not all of the roof.

WILLIAM EDWARDS, who designed and constructed the Pont-y-ty-Pridd, which for long had the widest span of any bridge in England, used to be pointed out as one of the exemplars of the pursuit of knowledge under difficulties. He was described as an ignorant mason, but he had a genuine skill in engineering, and if he lived at a later time he might be regarded as the rival of TELFORD. His story has been retold in a history of the bridge, with an investigation as to its stability, by Mr. W. B. COVENTRY, C.E. (SANDS & Co.). EDWARDS was a farmer's son, and had an early practice in building drystone fences, i.e. without the aid of mortar. Then, having seen some masons at work, he procured suitable tools and in a short time was proficient in dressing stone. He erected some houses, mills and forges, and when he was twenty-seven he obtained the contract to design and carry out the construction of a bridge across the Taff. It was a three-arched structure, but in a couple of years it was destroyed by a flood. As he had engaged to maintain the bridge for seven years, he was compelled to erect another, and he resolved that it should be a single arch with a span of 140 feet and a rise of 35 feet. The work was not quite completed when the pressure of the haunches forced out the crown of the bridge. Then he undertook a bridge with a similar span and rise, but with cylindrical openings in the haunches. The third bridge was completed in 1755, and it still survives, although allowed to be used for foot-traffic only. There is some uncertainty about the thickness of the arch. EDWARDS declared the thickness of the arch to be 2 feet 6 inches. That was a risky depth for the arch, and perhaps it is as well the bridge has been restricted to foot-passenger traffic. He erected several other bridges and gained a local reputation. He died in 1789 at the age of seventy. Mr. COVENTRY uses the bridge for an interesting analysis of bridge statics. The days for masonry bridges are over, but still the subject is interesting, and the small book will be found useful reading by students of construction.





PAINTERS' ARCHITECTURE: CLAUDE LORRAINE.

## IRISH CROSSES.

WHEN JAMES BARRY, who was the first Professor of Painting at the Royal Academy, was a young man of twenty, he exhibited a picture in Dublin which attracted the attention of EDMUND BURKE, who became the most generous and forbearing of the artist's friends. The subject represented was the baptism of a king of Cashel by St. PATRICK. According to the legend, the saint transfixed the foot of the royal catechumen with his iron-shod crozier, who thought the act was part of his probation, and underwent it without a murmur. The event presaged many things in the ecclesiastical history of Ireland. The people were destined to suffer for their belief, although we may presume they found compensation in other ways. However zealous they were as Christians and devoted to their creed, they were evidently not endowed with extraordinary architectural skill, for all that remains of their early churches must be regarded as indicating untrained workmen. Indeed it has been maintained by some archæologists that the Irish builders were not acquainted with mortar until after the English invasion. The buildings customarily admired by visitors are later than the twelfth century.

It is not unlikely that the Norman or Welsh builders who were employed in Ireland came under local influences. There may have been native artists who could produce most elaborate illuminations and ornamentation for metalwork which was almost as delicate as filigree. In that way the carving of stone would often show a treatment that would be unlike contemporary English work. It is, however, unwise to be dogmatic about the state of art in Ireland when the country was under the sway of several kings and princes who, with all their respect for Christianity, were not scrupulous in destroying churches and monasteries and confiscating their treasures.

The group of ruins known as Monasterboice, or the monastery of BUTE, which is about four miles from Drogheda, may be taken as an example of one of the primitive ecclesiastical establishments of Ireland. It is believed to have been founded towards the close of the fifth century. It had acquired reputation as a holy place, and it was in a part of Ireland which was likely to be more civilised than the western or southern districts. But as it was near the eastern coast it was liable to invasions by northern rovers, and on one occasion there was terrible retribution. It is recorded that in the year 968 "Monasterboice and Lan Lere were plundered from the Danes by DONALL, King of Ireland, and he burned three hundred and fifty of them in one house." That was a characteristic instance of Irish vengeance. In the following century there was another attack, and we read how "the Cloictheach (viz. round tower or belfry) of Monasterboice, containing books and several other valuables, was burned." As no Danes are mentioned it is possible the devastation was perpetrated as a consequence of enmity between two neighbouring clans. When so destructive a spirit prevailed examples of art were not likely to be respected, although they might have been "instrumenta ecclesiastica." Of the most important products of Irish craftsmen, only a few have survived, and it is wiser to con-

clude that we have not sufficient materials to enable us to define all the characteristics of Celtic art.

One of the celebrities of Monasterboice was a monk named FLANN, who was a poet, antiquary and historian. In the "Annals of the Four Masters" his death is recorded in the following manner under the year 1056:—

"FLANN of the Monastery, lecturer of Monasterboice, the last fountain of knowledge of the Irish in history, poetry, eloquence and general literature, died on the fourth of the calends of December, of whom it was said:—

"Flann of the great church of sweet Buite,  
The piercing eyes of his smooth head were modest;  
The godly man of Meath was he of whom we speak;  
The last professor of the country of the three Finns was Flann."

Some of his historical poems have survived; there are also copies of a chronological work by him entitled "Synchronisms of the Irish Kings with the Eastern and Roman Emperors, and of the Christian Provincial Kings of Ireland and the Kings of Scotland of the Irish Race with the Chief Monarchs of Ireland." It is safe to assume that FLANN was only one among many scholars who were associated with Monasterboice.

It is impossible to say whether the entire ecclesiastical establishment of Monasterboice is represented by the ruins which are to be seen. There are remains of two churches; one is supposed to have belonged to the twelfth century, while the other is connected with a much earlier time. The planning of both is of the simplest—an oblong, in which was a nave and choir. There is likewise a round tower of about 110 feet in height, but originally it must have been yet more lofty, for the conical top was destroyed by lightning. Evidently it consisted of five storeys. Six feet from the ground is the doorway, which is 5 feet 6 inches by 1 foot 10 inches.

Similar buildings are to be found in other places in Ireland, such as Clonmacnoise, Glendalough, &c. But among all the Irish crosses there are none which surpass those of Monasterboice. There were three, but the principal part of the third has been destroyed.

The crosses are for want of a better term known as "high crosses," in order to distinguish them from the crosses which have been carved on horizontal tombstones. At one time they were likely to be seen near all the principal ecclesiastical establishments, but no more than forty-five of them have survived. The majority present examples of sculpture like those of Monasterboice. It is supposed that they all belong to a period between the tenth and thirteenth centuries.

They are interesting not only for their intrinsic merit, if considered separately, but also on account of their connection with more ancient art. Anyone who will look at an ancient bell shrine, like that in the Wallace Collection, a crozier, a chalice, a case for a Book of the Gospels or a brooch, will perceive that the Celtic artists always treated a subject by means of panels. There may be a resemblance between the character of the ornament, but all-over patterns are unknown in Irish decoration. Possibly the



employment of Irish diamonds in the decoration may have suggested that there could be no more interesting way of adorning the intermediate spaces than by arranging them as panels to be filled in either with a variety of ornament or by repetitions of what was found in one panel. In arranging the interlacing or the scrollwork the artists did not always observe a symmetrical arrangement. They allowed themselves liberty, and sometimes made the part on the right of an axis slightly different from that on the left. It is this variety which distinguishes original work from modern imitations. In our days repetition is considered to be indispensable. It is observed in imitations of Celtic ornament, and in consequence the work has a lifeless appearance which would horrify the old Celtic carvers and metalworkers.

When it became necessary to set up tall crosses as memorials of a prince or abbot, the artists adhered to the

the twenty-four panels have been indicated, viz. the Crucifixion, CHRIST in Glory, the Last Judgment, St. MICHAEL weighing souls, the Fall of ADAM and EVE and their Expulsion. It is well to note that archæologists are not unanimous about the meaning of the iconography, and the photographs suggest that with such figures a great deal of latitude should be permitted.

The name of MUIREADHACH might be expected to afford a clue to the time when the cross was set up. According to the Annals, an abbot of that name, who is described as the son of FLANN, died in 844, and he is presumed by some archæologists to have given the cross. But he could not have been the son of the Professor FLANN who is said to have died



CROSS AT MONASTERBOICE.



CROSS AT MONASTERBOICE (MUIREADHACH'S.)

ancient principle of panel treatment as if it alone were appropriate. Indeed, precedents in metalworking are suggested throughout. The upper part of the cross, as we see in the examples from Monasterboice, becomes a small shrine. The circle around the arms might be a copy on a large scale from a brooch. The twisted lines which enclose the panels are also familiar in the old jewellery. The panel system was likewise appropriate, for it enabled the cross to assume the character, as it were, of a pictorial bible. Owing to the defacement, it is not possible to make out all the subjects. In the taller of the two crosses we illustrate, which is 20 feet high, the subjects of nine out of twenty-two panels can be identified. They are supposed to represent the Fall of Man, Expulsion from Eden, ADAM delves and EVE spins, the Death of ABEL, the Worship of the Magi, with its type, the Three Warriors before DAVID, MICHAEL and SATAN at the weighing of souls, the Crucifixion and Last Judgment. In the second cross, which is generally known as the Cross of MUIREADHACH, because it bears an inscription asking prayers for his soul as the maker of the cross, the subjects of six of

in 1056. In 922 another abbot, called MUIREADHACH, passed away; he is described by the annalist as "chief beadsman to all the men of Bregia, youths, clerks and the steward of PATRICK's people, from Sliabh Fuaid (the Few's Mountain) to Leinster." The cross might have been produced in the time of either of these ecclesiastics.

The county of Louth contains many remains of antiquity. At the period of the invasion it was known as part of the territory of Oriel or Ulster, and having been conquered by DE COURCY it was a portion of the large region granted to him. The prehistoric archæology of Louth is represented by earthworks, stone circles, &c. Besides Monasterboice there was an abbey at Mellifont of which remains exist, there are various castles which were erected for the protection of the English, and although the county is the smallest of the thirty-two in Ireland, it presents many features to reward the artist and archæologist.

The illustrations of the two crosses are from photographs by Colonel R. W. STEWART, R.E., whose work is familiar to amateur in England, and who now derives pleasure in making records of the antiquities and scenery of Ireland.



## EARTH THE DESTROYER.\*

THERE was a time when men believed they were actually, and not in a rhetorical sense, "Lords of Creation." They looked on the earth as their creature which could be operated on in a great many ways, and dare not give any sign of discontent. SHAKESPEARE, alone among poets or seers, seems to have had a misgiving that the earth could be a source of danger. When he called it "the dungey earth" the adjective was suggestive of much which was unpoetic or unfit to be expressed in a theatre, however rude. He also realised that a considerable part of what was dangerous found its origin there, and that, in fact, some of the evil in man came from the soil on which he stood like a ruler. What can be more expressive of modern scientific theories than the address—

Common mother, thou,  
Whose womb unmeasurable, and infinite breast,  
Teems, and feeds all; whose self-same mettle,  
Whereof thy proud child, arrogant man, is puff'd,  
Engenders the black toad and adder blue,  
The gilded newt and eyeless venom'd worm,  
With all the abhorred births below crisp heaven  
Whereon Hyperion's quickening fire doth shine?

And in other passages we can see how truly he realised that man and the earth were subjected to the universal law of action and reaction. As Dr. HYDE says, "Wherever there is life we have a corresponding amount of death," and in the end the earth was the victor, for the dust of ALEXANDER might become loam and stop a beer barrel, while imperious CÆSAR turned to clay could patch a hole in a wall. Modern architects have, beyond most men, to understand that debit and credit relationship which is universal, and it is their business as far as possible to overcome the destructive power of the earth's surface. The drainage of building sites, the substitution of concrete, asphalt and other impermeable materials are all efforts to subdue the dangerous elements which are inevitable, or to keep them at a safe distance.

The series of lectures delivered at the Royal College of Physicians by Dr. POORE give an explanation of the extent of the dangers which are beneath our feet, and which, unless care is taken, can grow to be fatal to man. He therefore opens with a definition which a few years ago would be thought excessively pessimistic, but which has become no more than a truism. "That which we commonly speak of as earth, soil or humus, is," he said, "largely composed of excreta and the dead remains of animals and vegetables, which, as the result of fresh biological processes, are either returned to the bodies of living vegetable organisms, or after becoming mineralised and soluble, are washed downwards by the rain, and ultimately find an exit in the sea." Some of those organisms seem to be attracted by men, adhering to skin and clothing, clinging in the hair, and taking refuge under the nails. How numerous they are is shown by a Local Government Board report, in which it is stated that they varied from 8,326 in a virgin sand and 475,282 in a virgin peat, to 115,014,492 in the soil from a trench in a sewage farm. Broadly speaking, says Dr. POORE, in his plain manner, the microbes bear a proportion to the amount of dung, and a gramme of dung from a cow fed on hay contained 165,000,000. Tetanus, anthrax, cholera, Malta fever, plague, diphtheria, enteric and a host of diseases are all proved to be traceable to conditions of soil.

What is remarkable, that even with precautions taken to protect human life from the dangers of the soil, yet somehow noxious organisms contrive to escape from their prison. There are authorities who hold that diphtheria is a soil disease, although Dr. POORE says that is not proven:—

Newsholme's figures generally seem to show that diphtheria is now a disease more of the towns than of the rural districts. It is not very easy to understand how in a city where pavements and other impermeable coverings to the soil are general,

the bacillus is driven by the rising subsoil water into the air. Of course, it may be driven out of the sewers and sewer ventilators, in which case it becomes a sewer disease rather than a soil disease. Why is it not an air disease? Nobody who has ever smelt the air of Bond Street in a hot July, or who has watched the impurities descending from the upper air when they are driven downwards by the first showers after a drought, would refuse to allow to the air of a city any amount of potential infectivity. Most of the facts collected by Newsholme are explained as readily, if not more readily, on the theory that diphtheria is an air disease as upon the theory that it is a soil disease. If we remember that a theory is not a fact, these speculations will do no harm. Unfortunately this is not always remembered. Diphtheria (Copeman) has been supposed to show a preference for houses on damp clayey soils (Greenhow, Airy), and dampness of habitation (Thursfield). "Although," says Copeman, "dampness of site is undoubtedly a factor in the production of outbreaks of diphtheria, particularly if such dampness be due to persistent leakage from imperfect sewers or cesspools," it does not appear to bear any relation to the rise and fall of the subsoil water. That diphtheria is a soil disease is certainly not proven.

It is a disputed point how far excavations for railway and other works on a large scale produce outbreaks of malaria. The Royal Engineers, who have at times to become navvies, suffer more from fever than other troops. Excavations in Margate, before a general drainage system was adopted, used to cause much illness among the men employed. A similar experience has been derived in other English towns. PETTENKOFER was the first to maintain that enteric fever is due to a soil organism. Sir CHARLES CAMERON confirmed that conclusion by the observation of 4,000 cases of enteric fever in Dublin. He also makes a statement which is enough to overthrow a widely spread belief, for according to him, "where gravel forms the site of streets there is far more typhoid fever than in the districts which rest upon the stiff boulder clay. This is clearly owing to the fact that the bacillus typhosus, which is ærobian—that is, requires oxygen—can get it more freely in the loose gravels than in the stiff clays. In the gravel, too, there is a much greater space for the development and movement of the bacilli." It is also remarkable that Chichester, in which there was an outbreak of enteric fever in 1896, is built on a bed of gravel. Maidstone suffered in 1897 in the same way, but there the ground was contaminated by leaky sewers, drains and cesspools. It was noteworthy that the inmates of the prison and barracks escaped the contagion.

Dr. POORE, it should be remembered, is for sanitary purposes an experimentalist in agriculture, for he has kept a garden at Andover in which to test his theories. He therefore admires the system which has been followed in Holland, and especially in Groningen and Friesland, of treating refuse. In that district enteric fever is rare, and Dr. POORE asserts it is owing to the anxious care which is bestowed upon the ground. "The Dutchman," he says, "is fully impressed with the necessity of returning to the soil everything that comes out of it. Nobody knows better how to facilitate that circulation of organic matter which is a law of nature, and he sees that his profit depends upon the completeness and rapidity of that circulation, and that in farming, as in other business, a rapid turnover of capital is to be aimed at." In like manner the great endeavour of the city of Manchester to reclaim Carrington Moss and Chat Moss through the agency of refuse receives merited praise. It may not everywhere be practicable to deal with the refuse of towns and cities in so successful a manner. But Dr. POORE is of opinion that the only remedy for many of the evils of our time is by an adoption of a similar principle. We may pave the backyard, he says, and provide it with a gully, and have ventilated sewers, and yet vapours will come near our bedroom windows. The majority of sanitary experts who have to cope with the problems in crowded cities are glad when refuse is removed to a distance, regardless of what becomes of it. That kind of sanitation, according to the author, involves a systematic starvation of the soil. If his own theories were carried out the earth would be enriched, and he believes that agriculture would once more become a profitable occupation. Holding such a theory, Dr. POORE keeps a sharp watch for the defects to which sewers are liable. He gives an account of various outbreaks of illness which were caused by "the insuction of foul air or liquids by leaking water-

\* *The Earth in Relation to the Preservation and Destruction of Contagia.* Being the Milroy Lectures delivered at the Royal College of Physicians in 1899, together with other papers on sanitation. By G. V. Poore, M.D., &c., Professor of the Principles and Practice of Medicine, University College, London. (Longmans, Green & Co.)



pipes during intermissions in the supply," and when we hear of water mains being laid in the same trenches as sewers, and that a sewer has been traversed by a water-pipe, the possibilities of insuction are not rare. At Worthing in 1893 what seemed to be almost a plague was partly attributed to the accidental mixing of the Worthing water with the supply of the adjoining districts, the latter being fouled. Every water company, Dr. POORE suggests, should maintain a laboratory for chemical and bacteriological examination of the water it distributes, with efficient experts who would test samples daily or hourly.

Dr. POORE gives a description of a cottage he has had erected, which is interesting as exemplifying his principles. It consists of a living-room, three bedrooms, scullery and washhouse, glazed verandah, and, above all, a rain-water tank. It is laid out with one of the angles pointing due north in order to have a possibility of some sunshine on every wall in all seasons of the year. There is a passage or hall running from back to front, with a door at each end, so as to have a through draught. The rooms do not directly communicate with one another. Each of them has a fireplace, and no fireplace is placed against an outer wall. The walls are built of mud (that is, chalk puddled up with straw), flints and timber being the only other materials found in the locality. The mud is 15 inches thick, with rough-cast on the outside and a lining of match-boarding, so that the thickness is about 17 inches. The floors are of concrete finished in granite cement, and the skirtings are of the same material. The cost of the walls was 5s. per perch—i.e. 1 foot high, 15 inches thick and 16½ feet long. The walls do not correspond with the by-laws of the Local Government Board, but in a fire at Andover it was found that old mud walls of cottages withstood the flames. When the tendency of by-laws, says Dr. POORE, is to boycott a local building material and to extinguish a local industry, the pros and cons ought to be very carefully weighed. The rain-water tank is constructed on the principle of the Venetian cistern. It is circular in form, having a diameter of 7 feet and a depth of 10 feet. In the centre is a diaphragm perforated at the bottom by three drain-pipes. The water which falls from the roof passes through two strainers in an ornamental vase, and then through gravel and sand before it can be drawn through the pump. Lead, iron or galvanised iron have been avoided. As the roof is 1,100 square feet in area, it is assumed that the supply is 15,000 gallons a year, or more than 40 gallons per day. Other sanitary arrangements are described at length, but the total cost of this experimental cottage is not mentioned.

In planning buildings architects are not always free agents, for they are subjected to building Acts, by-laws and other edicts. Dr. POORE dare not erect his cottage without trekking across the boundary of the borough of Andover. Much of what he recommends, however desirable, could not be realised unless under exceptional circumstances. But his pages are worth consideration, for they are suggestive of the differences between natural and artificial systems, while recalling primitive and remote practice. The author's earnestness is not to be questioned, and his Milroy lectures will have their use by suggesting the sternness of the conditions of life, the difficulty of discovering nature's laws and the punishments which attend all infraction of them.

#### TEDDINGTON AND KNELLER HALL.\*

MY desire in bringing you to Twickenham to-day was to give you an insight into one of the oldest villages within twelve miles of London; there is no place which has been made more famous as the abode of eminent men and women of arts and letters than Twickenham.

Kneller Hall, formerly of the parish of Twickenham, is now allotted to Hounslow, but the hall dates back only some 100 years; it was then called Whitton House, the name given it by Godfrey Kneller, when he built it in the years 1709-11. He only lived to enjoy it some twelve years, as he died there in 1723.

The house was of red brick, stately, had good rooms and a fine staircase, which, according to the fashion of the time, was painted by Laguerre. Kneller intended to employ Sir

James Thornhill, but learning that he was engaged on a portrait of Sir Isaac Newton, said no portrait-painter should paint his house, and called in Laguerre. Lysons says Sir Godfrey Kneller painted the staircase himself, assisted by Laguerre.

Kneller, the most fortunate of portrait-painters, was a native of Lübeck. Originally destined for the Army, he was sent to Leyden to study mathematics and fortifications, but nature had destined him for a painter, and he became a pupil of Rembrandt. He came to England in 1674, whilst Lely was at the height of his reputation. By the Duke of Monmouth's desire the king sat to Kneller at the same time that Lely was painting him for the Duke of York. The young artist's success on this occasion fixed his character, and he became portrait-painter to the king, and continued his position under James II., William and Mary, Queen Anne and George I. He had painted ten monarchs, and been celebrated in verse by Dryden, Prior, Pope, Addison, Steele and Tickell. He was very wealthy, lived here in great state, was a J.P. and churchwarden of Twickenham.

As a J.P., having no distrust in his own judgment, he was apt to decide by equity rather than by law. A soldier who was brought before him, detected in the act of stealing a joint of meat, pleaded in extenuation of his offence that the exposure of the luxury was more than he could resist. The argument convinced Kneller completely. He at once discharged the wretched thief, and severely reprimanded the butcher for unduly putting temptation in the fellow's way. On a question arising as to which of two parishes a pauper belonged, Sir Godfrey would hear no evidence, but assigned him to the richer one promptly. In his great humanity he would refuse to distrain on a man who had nothing but his furniture with which to pay.

He was of inordinate vanity; he bragged more, spelt worse and painted better than any artist of his day. He was knighted by King William, and created a baronet by George I. in 1715.

He lies buried in Twickenham parish church, but his monument is in Westminster Abbey.

After the death of Kneller's widow the house was sold, and was enlarged and remodelled by a Mr. Culvert, the owner, under the superintendence of Mr. Philip Hardwick, R.A. Kneller Hall, as the house was now called, was purchased in 1847 by the Council of Education, and converted into a training school for schoolmasters of workhouse schools, the master being Dr. F. Temple, subsequently master of Rugby, and now Archbishop of Canterbury. To fit it for a training school, the house was in a measure transformed, and enlarged and re-



KNELLER HALL.

decorated by Geo. Mair, who arranged the front after the style of Wollaston Hall. In 1856 it was still further altered on being transferred to the War Department, and converted into a school for the education of bandmasters and musicians for the Army.

The Royal Military School of Music provides a thorough course of practical and theoretical instruction under a competent staff of teachers. Little is now left of Kneller's house.

On our way to Teddington we pass Pope's Villa—little like the original house when Pope resided there from 1717 until his death in 1744.

Kitty Clive's cottage was called Little Strawberry Hill; she moved here from Little Marble Hill Cottage. Kitty Clive's maiden name was Miss Raftor; she was the daughter of an Irish gentleman; she was born 1711, and died at Strawberry Hill in December 1785. In 1769, having acquired a good competence, she retired from the stage and resided at Strawberry Hill. She was married in 1732 to a Mr. George Clive, a barrister, but though the match did not turn out happily, her

\* A paper read by Mr. Arthur C. Doughty before the members of the Upper Norwood Athenæum.



character always stood unblemished. When she was asked why she did not accept the hospitality offered by some ladies of the nobility, she said she chose her company as she chose her fruit, and she was not for damaged quality.

Strawberry Hill House was originally a small tenement built in 1698 by the Earl of Bradford's coachman and let as a lodging-house. Colley Cibber was one of its first tenants. The beauty of its situation afterwards tempted persons of rank to take it as a summer residence. Talbot, Bishop of Durham, lived in it eight years; after him Henry, Marquis of Carnarvon, Lord John Philip Sackville, afterwards took the house, and then in 1747 the Earl of Oxford (then the Hon. Horace Walpole), bought the house and enlarged it during 1753 to 1776, and decorated it inside and out in the Gothic style. At some future time I hope to have the pleasure of taking you over the interior and grounds.

We now arrive at Teddington. The manor was given to Westminster by the founder Sebert, first Christian king of the East Saxons. In the year 1547 it was surrendered to Henry VIII. by the abbot and convent of Westminster. King James in 1603 granted a reversion of the manor to John Hill and his heirs.

The manor house, which stood opposite the west end of the church, was pulled down about three years ago. It was built by the celebrated Lord Buckhurst. One of the bed-chambers contained a State bed, given by the Emperor Charles VI. to Sir George Rooke.

The Earl of Leicester resided at Teddington in 1570. William Penn, the celebrated Quaker, lived there in 1688. The letter wherein he clears himself from the charge of being a Papist is dated from Teddington, October 24, 1688. John Wilkes was in hiding there, the second turning up the High Street from the church.

The parish church, dedicated to St. Mary, is a small brick structure consisting of a chancel, nave and two aisles.

The south aisle appear to have been built and the chancel repaired in the early part of the sixteenth century. The east window is much more ancient. The north aisle was added in 1753, principally at the expense of Dr. Hales, who rebuilt the tower in 1754. In the church are the monuments of Sir Orlando Bridgman, Commissioner to Charles I., and Lord Clarendon speaks of him as being in the confidence of that monarch; of Richard Parsonby, of Taunton, 1613; of William Terremant, of Whimble, Devon, 1618; of Margaret Woffington, 1760; and the celebrated Dr. Hales, who lies buried under the tower he built, was one of the vicars of Teddington, and refused a canonry of Windsor. There are also tablets to Henry Flitcroft, architect of churches of St. Giles-in-the-Fields, and St. Olave's, Tooley Street. Richard Bentley, friend of Horace Walpole, and designer of Strawberry Hill House, and Paul Whitehead, the poet and friend of the notorious Lord de Despencer, is buried in the churchyard, 1774. There is a tablet to John Walter, founder and principal proprietor of the *Times*. He had a residence at Teddington. The oldest monumental inscription is 1506, to John Goodyere and his wife.

The old church proving inadequate for the increasing population of the parish, about fifteen years ago the new church to St. Alban the Martyr, one of the finest of modern churches outside London, was built from designs of Mr. W. Niven, a then resident in the parish. In the design of the new church it was the endeavour to preserve the connection with the monastery of Westminster, to which Teddington formerly belonged.

Westminster Abbey was designed by architects who studied abroad, and by the express wish of its founder was modelled on French lines. For that reason it was determined that the new parish church should follow the general plan of French parochial churches. This meant an apse, an ambulatory, a vaulted ceiling and a far greater interior height, as compared with the width, than is usual in England.

The silver lamps came from the church of the Holy Sepulchre, Jerusalem. The centre one is made of engraved silver, and is one of a set or series which is thought to have been made in Venice, and brought thence by Crusaders or pilgrims from the west. The other six are beaten silver, and probably of Russian origin. The patriarch of Jerusalem had an inscription engraved on each of them.

In the little chapel of All Saints the reredos is a copy from Henry VII.'s Chapel at Westminster. The processional cross, the candelabra, the pulpit, stained-glass windows and many other adornments of the church are all gifts of the parishioners.

Before I conclude my paper I must express my indebtedness to my friend, Mr. Knapp, the managing director of *Surrey Comet*, Mr. Harradence and to Mr. Wm. Rice for their kind assistance in the preparation of my paper.

The illustration of Kneller Hall is from a photograph by Mr. Charles Wheeler.

**A Chapel** is to be erected in the grounds of the Royal Military Academy, Woolwich, for the use of the cadets, at a cost of 6,000l.

## TESSERÆ.

### Stothard's Early Career.

STOTHARD was bound for seven years to a master living in Spital Square as a draughtsman of patterns for brocaded silks, then much in fashion. About two years before the expiration of his indentures flowered silks lost their vogue and the business of his master became slack. Having time on his hands, Stothard amused himself with making designs for Homer's "Iliad," Spenser's "Faery Queen" and other books he got into his possession. The master soon after died and the rest of the time he served with the widow, who also encouraged his taste for historical drawing. With some of his sketches she adorned her parlour mantelpiece, and these accidentally were the means of determining Stothard's future career. Two gentlemen calling one day on business, one of them was struck with the drawings, and on being told they were by a young apprentice, asked to see him. The stranger was Mr. Harrison, editor and proprietor of the *Novelist's Magazine* and the same who availed himself of Turner's early drawings. Taking a book from his pocket, he asked Stothard to read it and to make a design from any passage which most struck him. On calling at the time appointed, Mr. Harrison found three sketches ready, which he approved, and the young artist got his first fee of half a guinea. At the end of his apprenticeship Stothard's mother was living at Bethnal Green, where he went to reside with her and added to his little income by painting small family portraits among the neighbours. In 1778 he went to Portsmouth to visit Darcey, a fellow-artist, with whom he had become acquainted in London. Here he first resolved to follow painting as his profession; and returning to London, took lodgings in the Strand with another friend, Shelly, afterwards of some eminence as a miniature painter. His connection with the *Novelist's Magazine* became more fixed, and in a memorandum among his papers it appears that he made for that work 148 designs at one guinea each. For twenty-six designs for the *Poetical Magazine* he had the same rate of payment. For twenty theatrical frontispiece portraits he received 7s. each, and for various borders and vignettes, 6s. Such was then his humble work and moderate payment. It was about this time that he painted his first picture, "A Holy Family," for the Society of Artists, and soon after was admitted as a student at Maiden Lane, where, before the establishment of the Academy at Somerset House, the artists occupied temporary apartments.

### Chambers's "Treatise."

The buildings of Chambers have been censured for their multitude of little parts, and his "Treatise on Architecture" has something of the same fault. It is broken into no less than twenty-six portions, but such minuteness of division was in so far necessary, to the end that individual parts might be viewed and considered by themselves. We must never forget, however, that a door-piece, or chimney, or stair, however elegant in itself, must fit its place and harmonise as a member in the mansion, before it can be pronounced beautiful. The following is the order of arrangement of this memorable treatise:—(1) Origin and progress of building; (2) Parts which compose the orders of architecture, and of their properties, application and enrichments; (3) The orders of Architecture in general; (4) The Tuscan order; (5) The Doric order; (6) The Ionic order; (7) The Composite order; (8) The Corinthian order; (9) Of pilasters; (10) Of Persians and caryatides; (11) Of pedestals; (12) Of the application of the orders of architecture; (13) Of intercolumniations; (14) Of arcades and arches; (15) Of orders above orders; (16) Of basements and attics; (17) Of pediments; (18) Of balustrades; (19) Of gates, doors and piers; (20) Of windows; (21) Of niches and statues; (22) Of chimney-pieces; (23) Of profiles for doors, windows, niches, chimneys, &c.; (24) Of block cornices and extraneous entablatures; (25) Of the proportions of rooms; (26) Of ceilings. To these were added an introduction concerning the natural genius and acquirements necessary for an architect, designs for casines, temples, gates and doors, and an explanation of the principal terms employed in the science of architecture; the whole accompanied by such illustrations as the author supposed his text to require. Chambers seems neither to have wanted knowledge nor to have spared consideration and research to render his work worthy of public approbation. Here we have the progress of architecture traced from the wigwam to the palace, and may read in a sequence of examples how rudeness grew into beauty and coarse strength into splendour and magnificence.

### Correggio.

To express divinity distinctly, and apart from earth, was for a long time the aim of religious art. Raphael and Correggio were the first great masters who strove to humanise the Virgin and her Son so as to give the tenderness of the mother and the innocence of childhood in one group, in which the Divine element should be secondary to the sanctity of those affections which cling closest to the heart of humanity. They



sought to unite the loveliest human forms with its tenderest expressions. Raphael alone triumphed, and gave to the world those holy families which in motive and grace of feeling are unrivalled in art. Correggio's genius was not equal to so lofty a flight. He was undoubtedly great in his manner and clever in the subtleties of painting, but he has left nothing that touches the heart, if, indeed, he may be said to have escaped affectation. There is no painter, considering his reputation, who disappoints the spirit so much. In repeated instances he sinks into downright insipidity or sensuality. There is nothing divine about his holy women. Their beauty is solely of the skin. No one need fear to make love to them. His children have nothing attractive in feeling. Considered with the French school, Correggio is, indeed, pure, but compared with his contemporaries he made a sad inroad upon sacred art. In painting Correggio is artificial, and in spirit superficial. Those cloud forms in the dome of the Parma Cathedral are, however, wonderfully transparent, and let the eye into the abyss of heaven. He is most at home in the nude and classical, as may be seen in that sunny picture in the Louvre. The flesh is bad. It has not the quality of healthful skin, but looks tainted. On no subject in art is there more diversity of opinion than in colour. Some individuals cannot distinguish one colour from another; others call the same hue by different names. A blind man, through feeling, is perhaps a better judge than many with full eyesight. By some Correggio is considered a good colourist. His rainbow tints have, however, a tricky, flashy look, unworthy of high art, and savouring more of its legerdemain. There is no reality in them. They seem altogether evanescent. Like the toilette of a charming woman, they are used more for their own sake than for the subject.

### The Temple of Selinunte.

The gigantic ruins of Selinunte are probably the most astounding exhibition of human power that was ever witnessed. Amazement tintured with some degree of incredulity is, perhaps, the first impression which these stupendous ruins create. Can these ponderous masses of rock have ever been erected to their former accredited altitude of more than 60 feet by human hands? A large portion of one column and a lesser one of another are all that are erect, the rest are tumbled about block over block, the evident work of an earthquake; and what power less than that of an earthquake also could the architect have had at his command when he erected the vast edifice? It is said to have been built by a colony from Megara, under Pamilio, in the thirty-fifth Olympiad, and that it was destroyed by Hannibal not long afterwards. The city was nearly destroyed a second time and remained in that state until the ninth century, when the Saracens completed the work of devastation as far as they could. The mother country displays no such colossal relics. Here, indeed, the tourist will feel that he is one of the degenerate race of beings that old Homer speaks of. A nation of Ajaxes must have been selected to build the temple, and nothing less than an Archimedes could have conceived the practicability of its execution—the bold mechanician who boasted that he could move the globe if he had a fulcrum for his lever. There are two other temples of inferior magnitude. Altogether they form a most exciting exhibition. Breval, writing in 1738, says of them:—"I measured one entire piece of a broken entablature about 18 feet long and 24 feet thick. I took notice likewise of a kind of monumental, but quite unornamented piece of granite-like marble, that stood by itself in the midst of an adjoining field, which exceeded a double cube of 20 feet. The ruins of its amazing temples and other public structures are a demonstration, beyond any other that Europe affords, how far the ancients exceeded the moderns, not only in a great taste of architecture, but likewise in their skill in mechanics, by raising to such a height such unwieldy and ponderous bodies."

### Rembrandt and Spinoza.

Amsterdam, Spinoza's birthplace, is fitly called the Venice of the North, and it may be that the marvellous colour which appears in the Netherlander and Venetian paintings came from contrast with nature, the contrast which makes the eye, by some physiological necessity, see inwardly the opposite of what it is looked upon, and thus makes the flaming sunset suggest the tranquil blue of the sea, and the ruddy dawn prepare the eye for the quiet green of the meadows. It is certainly worthy of note that painting has so thriven in low countries, so rich by nature in colour and scenery, as Venice and the Netherlands; and that the Van Eycks, who were virtually the founders of oil-painting, and the great masters of colour, Rubens and Vandyke, were Netherlanders, and Titian and Tintoretto, the great colourists of Italy, were Venetians. Rembrandt, indeed, rebelled against the power of colour, and owned only a law of light and shade; and Spinoza, his contemporary and countryman, followed him by discarding all colour from his style; yet both magnify the element which they discarded by the gloom of its absence. Rembrandt's pictures and Spinoza's

writings make us long for rich fields and bright flowers, gay birds, playful children, ruddy men and fair women. Spinoza learned to draw, but we have no specimens of his work; and there is little reason to suppose that he had more colour in his pencil than his pen, which not only gives no colour to its pages, but does not report any from nature and life, and presents even the rainbow, not in its prismatic beauty, but in its mathematical law.

### St. Margaret's, Westminster.

No truth is more certain than that the surest way to dwarf a really large building is to remove from it all standards by which its size may be estimated, and plant it alone with a free space all round it. We all know how much smaller St. Peter's appears than St. Paul's from this very cause. The magnificent piazza in which it stands, and the accurate proportion of its colonnades and other adjuncts, all tend to bring down its size and diminish its effect. Now, at Westminster, St. Margaret's just supplies what St. Peter's at Rome wants. We see a very large building with a lofty tower dwarfed into insignificance by the side of the Abbey, and we almost unconsciously grasp the dimensions of the building, and have a feeling of its magnitude which would be lost if this standard were removed. We may add that St. Margaret's has become more than ever essential now that the Palace of Westminster, with its lofty towers, has been erected in such close proximity to the Abbey. The dignity of the older building suffers grievously in all distant views from its aspiring neighbour. Remove St. Margaret's and the nearer view would almost equally suffer.

### Architecture, Sculpture and Painting.

The treasures of sculpture which England possesses are undoubtedly the Elgin Marbles. Yet what were they but subordinate to the building which they adorned? The sculptor limited and compressed his superb metopes to fit into architectural spaces designed and commanded by the architect, and lengthened his frieze (by, to him perhaps, tedious repetition) to the measures and proportions prescribed to him. But, more wonderfully still, the sublime artist shaped and bent and cut off portions of his splendid figures, though finished, as carefully on the shoulders as on the chest, and even where the projecting cornice must have hidden their beauties, so as to fit and adapt them to the slopes of the tympanum, till they diminished to the emerging heads of Aurora's steeds—heads that make us fancy he must almost have felt indignant at not being allowed room for equally matchless bodies. But how could such an artist have lent himself to the adornment, or rather the work, of such a building, unless he had felt it to be worthy of him? How could his genius have bowed and adapted itself to any but a kindred and avowedly equal one? It was necessary, indeed, that architecture, in its artistic character, as capable of satisfying and gratifying the eye, should have been on a level with sculpture, to have so secured its confidence, co-operation and almost subordination through the very masterpieces of its skill. And the same must be said of painting. With few and not perfectly successful exceptions, we are content with easel paintings to hang upon the walls of private houses or even of galleries. The latter, indeed, as public buildings ought to give ample scope to architecture, and at Florence or Munich they have done so. But in most countries chance buildings have been adopted or adapted to give a home to pictorial art. Yet painting on a great scale, and for public instruction, requires great wall-spaces, expressly provided for it by the architect.

### Religious Art.

In all countries and under all creeds the law under which an earnest and true art has been developed appears to have been similar. Thus, in Egypt we find no essential difference between the palaces, the temples and the tombs; the same art, in architecture, sculpture and painting, encircled the people at their feasts, their festivals and their funerals. So it was in Assyria and Greece. Religious art drew vitality from the life of the people; noblest form and action in grove or temple was modelled in the clay, and the people who walked the streets of Athens found, through sculpture, apotheosis on the pediments of the Parthenon. Even hostile religions may come into accord through art. St. Paul, while standing on Mars Hill, could see the figures of Phidias as they looked down from the Acropolis; and now these marbles from Minerva's Temple, and the cartoon of the apostle preaching to the people of Athens, brought almost side by side in the same metropolis, seem to show that art, when noble and true, is almost of necessity religious. A spirit solemn and silent presides over the Elgin Marbles, and many minds will feel that the Theseus of Phidias has at least equal religion with Thorvaldsen's figure of Christ. The platitude then may be once more permitted, that the condition for the birth of every religious school, whether Classic, Mediæval or modern, seems always the same; the religion and the art must hold closely together, must be knit compactly as in unity of organic life, and, above all, must not be bound down to obsolete tradition and vague abstraction.



## NOTES AND COMMENTS.

AN inquiry has been made by Mr. T. MYDDELTON SHALCROSS about the practice of eighteen or twenty of the principal fire insurance companies in respect to the payment of architect's fees. He has ascertained that some of the fire insurance companies refuse to pay architect's fees incurred in the reinstatement of fire damage, notwithstanding that premium has been paid upon architect's fees, originally incurred, as part of the cost of the building insured; that other fire insurance companies only pay such fees in cases where they have been separately mentioned and described in the policy; and, again, that other fire insurance companies always pay such fees whether or not they are separately described in the policy. Those who think they are insured against fire would do well, therefore, says Mr. MYDDELTON SHALCROSS, to inquire from their assurers how the matter stands in their own particular cases, as otherwise, should a fire occur, they may find themselves uncovered to the amount of several hundreds of pounds in respect of their premises. For example, in the case of a building costing, say, 10,500*l.*, including architect's fees, and totally destroyed, the owner might find himself only able to recover 10,000*l.*, and have to bear the loss himself of the remaining 500*l.*, or, in the alternative, have to be satisfied with an inferior class of work in the reinstatement of the premises, *i.e.* work performed at the will of a builder without the direction and control of an architect, and there would, of course, be a similar result in case of a partial destruction of the premises *pro rata*. The malpractice is one of those which are endured by the sufferers rather than have it announced that their services were not appreciated and could be dispensed with. It is false pride which in such cases conceals unfair treatment. The insurance companies have no more right to withhold an architect's fees than to refuse to pay the contractor a profit on the rebuilding of the premises.

THERE must be something inherent in Liverpool which is opposed to the erection of a cathedral. When in the first half of the nineteenth century a project was announced, the outcry against it was so strong the promoters shrank from further attempts. The effort which was made a few years ago also came to nothing. The latest endeavour to accomplish the work has been met with an amount of opposition which we might say is characteristic only of Liverpool. The cathedral committee altered the conditions of the competition in the expectation of turning adversaries into friends, but to no purpose. The report of the advisory architects was one of unquestionable impartiality, and yet we find that the conclusions have been impugned. It is objected that only 103 architects entered into the first competition. But as the majority of the competitors are natives of this country, the number is not less than what was to be expected. There is cavilling at the fees paid to the advisory architects, which are no doubt two-thirds of the fees which will be received by the five competitors, but all architects who took part in the first competition were aware of the amount of the reward which awaited them if they succeeded in the first stage. It is also announced, as if with satisfaction, that the subscriptions reach no more than 154,114*l.* 16*s.* 3*d.* But when objections were raised and expressed in the most confident manner it was not to be expected that the class of people who usually contribute towards the erection of churches could escape from doubts about the character of the work which they were desirous of aiding. Even in the latest criticism it will be seen that a direct appeal is made to subscribers, for the last words of the document are:—"A dead site and a dead style seem to be the ideals of the executive committee, but the petition committee have confidence that the public, by withholding their subscriptions from the present cathedral scheme, will prevent ideals so lifeless being attained upon their behalf."

## ILLUSTRATIONS.

LOMBARD STREET, SHOWING BANKERS' SIGNS.

IN a time like the present, when trusts are created almost daily and companies are formed without much deliberation, it is becoming customary for traders who have some claim on antiquity to demonstrate their difference

from the new class who expect to thrive without having a history. The recent introduction of signs in Lombard Street has not on that account received any censure from those who are opposed to projections in general. It was remembered that bankers at one time made themselves known by means of signs. Some of those symbols were preserved, others are known by drawings and engravings. What we see in Lombard Street cannot therefore be looked upon as new inventions, for every one of the subjects can be justified by records which are valuable as evidence.

The City of London unquestionably lost many signs at the time of the Great Fire. Imitations of them were afterwards set up. But both ancient and later examples had to vanish in obedience to the Act of 1762. It was fatal to painted signs especially. Sculptured signs were interpreted to be part of the structure of the building to which they were attached, for English law is generally in favour of anything which relates to property, however remotely. In the Guildhall Museum some of those old examples may be seen.

Signs must have had their origin in the desire of all traders to make their places of business easily identified, so as not to be confounded with rival establishments. In Pompeii signs of many kinds existed, but archæologists of a confiding tendency have traced those objects to the time of ALEXANDER THE GREAT. The sun and moon are supposed to be a survival of pagan worship. La Belle Sauvage has been identified not only with Captain JOHN SMITH's lady-love but with SOLOMON'S Queen of SHEBA. Outside Turkey there is probably no city of Europe of old date from which signs were absent. In Paris they were likely to be as numerous as in Amsterdam.

It cannot be said that signs are a necessity in our day, for there is a variety of means by which to indicate commercial premises. They may be pardoned in Lombard Street as a means of suggesting banks which are old creations, and in such cases the artistic quality of the signs need not be considered. Yet in a thoroughfare like Lombard Street, where the Italian style prevails, projecting signboards seem less in keeping with their surroundings than in a street of half-timbered buildings or where other old-fashioned forms of architecture abound. The only signs enduring in a modern street would be those which could be esteemed as veritable works of art. M. DETAILLE has been endeavouring to have signs of that class produced by Parisian painters, and several artists who have gained reputation have co-operated in realising his project. The forthcoming exhibition will no doubt display works less simple than those now hanging in the centre of the City, and of which the significance is not always apparent. In Lombard Street the signs have unquestionably altered the character of the street, and some people may wish to have the example imitated elsewhere. It is only, however, when signs are unquestioned proofs of artistic power and remarkable for beauty that they should be allowed to interfere with architectural lines which were designed without any thought for such projections.

CATHEDRAL SERIES.—HEREFORD: THE CHOIR SCREEN.

IN 1717 the east end of the choir of Hereford Cathedral was partly concealed by a Classic screen which had been set up two years previously. It would not be easy to have anything more incongruous in a Mediæval building. A window above it, which lighted the choir, was filled in with a representation of the Last Supper, copied from a picture by BENJAMIN WEST, P.R.A. In 1841 Bishop MUSGRAVE called attention to the ruinous condition of the cathedral, and he was enabled to undertake a restoration which was confided to LEWIS COTTINGHAM, who remained in charge of the operations until his death in 1847. The screen was removed, as well as the Perpendicular window which had been introduced by some "improver," subsequently to the Perpendicular period. Many surprises awaited the restorers. The central pier was one of them, but the upper part, which is covered with painted decoration, is modern work. The reredos was erected in 1850, and was intended to be a memorial of JOSEPH BAILEY, who had been member for the county.

INTERIOR: ST. DAVID'S CHURCH, BATHGATE.

ELECTRA HOUSE, FINSBURY PAVEMENT, E.C.



## THE ARCHITECTURAL ASSOCIATION.

THE annual general meeting of the Association was held on Friday evening last in the rooms of the Royal Institute of British Architects, 9 Conduit Street, W., Mr. H. T. Hare, president, in the chair.

A vote of thanks was passed to the Royal Institute of British Architects for the eleventh annual grant of 100*l.* towards the education scheme of the Association, and a second vote of thanks was passed to Mr. H. Wilson for presenting a portfolio containing drawings, designs and sketches by the late Mr. John Sedding.

Messrs. A. Bough, C. J. Graham and J. R. Sanders were elected members. The list of nominations for membership to be elected at the next meeting contained fifty-five names.

A vote of thanks was passed to the Bath Stone Firms for their hospitality and kindness on the occasion of the visit of the Association to their Portland quarries.

The President distributed the prizes gained in the examinations. The following were the awards:—

A. A. travelling studentship, value 25*l.*, and silver medal, L. G. Detmar; second prize, value 5*l.*, G. S. Nicol. Banister Fletcher bursary, value 25 guineas, and medal, A. E. Richardson.

*Lectures. Division I.*

W. A. Hodges, A. A. scholarship, value 4*l.* 4*s.*

*Studio. Division I.*

J. F. Schneider, drawings of old work, prize value 10*s.* 6*d.*; H. L. Samson, study of ornament, prize value 10*s.* 6*d.*; H. L. Samson, construction, prize value 10*s.* 6*d.*

*Studio. Division II.*

I. S. Davies, design, prize value 10*s.* 6*d.*; A. E. Bullock, time sketches, prize value 10*s.* 6*d.*; A. E. Bullock, study of ornament, prize value 10*s.* 6*d.*; A. E. Bullock, construction, prize value 10*s.* 6*d.*; H. L. Samson, perspective, prize value 10*s.* 6*d.*

## ORDER OF MERIT.

*Lectures. Division I.*

Greek and Roman Orders.—1. E. G. Stevenson, book prize; 2. J. T. Sifton, 3. C. R. Pinsent. Elementary Construction.—1. W. A. Hodges, book prize; 2. H. F. Murrell, 3. H. D. Aubrey. English Architecture.—1. C. J. Goodwin, book prize; 2. H. F. Murrell, 3. H. J. Wyeth. Mediæval and Renaissance.—1. W. A. Hodges, book prize; 2. H. F. Murrell, 3. C. J. Goodwin. Elementary Physics, Formulae and Calculations.—1. R. E. Stewardson, book prize; 2. W. A. Hodges, 3. T. W. Watkins. Plane and Solid Geometry.—1. S. T. Hennell, book prize; 2. C. R. Pinsent, 3. H. R. Greig.

*Lectures. Division II.*

Materials, their Nature and Application.—1. R. J. Tyndall, book prize; 2. G. Church, 3. B. B. Hooper. Construction.—1. G. Church, book prize; 2. C. M. Crickmer, 3. A. Wood. Drainage and Water Supply.—1. D. Anderson, book prize; 2. B. B. Hooper, 3. B. Greig, A. Potter, 4. G. M. Page. Ventilation, Lighting and Heating.—1. G. M. Page, book prize; 2. D. Anderson, 3. B. Drummond. Professional Practice.—1. B. Greig, 2. B. Drummond, 3. W. J. Davies. Mensuration, Land Surveying and Levelling.—1. D. Anderson, book prize; 2. H. J. Rippon, 3. W. H. Baines.

*Elementary Class of Design.*

Prize, value 3*l.* 3*s.*, and bronze medal, H. Samson; certificates, E. G. Stevenson, H. Hyams.

*Advanced Class of Design.*

Prize, value 5*l.* 5*s.*, bronze medal and pass for modelling class, E. Gunn; certificate and pass for modelling class, E. G. Theakston; pass for modelling class, L. Lee, A. G. Scott, J. N. R. Vining.

## The President's Address.

Fellow-members and Students of the Architectural Association.—The first official duty your President is called upon to perform, that of addressing you at the opening of the session, is probably the most difficult and onerous of the many tasks which fall to his lot during his term of office. Time-honoured precedent, however, makes it impossible for him to avoid the duty, however much he might desire to do so, and it is a privilege not to be lightly set on one side. I therefore take up the burden, not so much in the hope that I may be able to say anything which has not been often and better said by my predecessors in the chair, but rather that I may give the necessary opening to what promises to be one of the most successful and important sessions which the Association has seen. What diffidence I may feel is dispelled by the testimony of your presence here to-night, which witnesses to the fact that this annual address is no mere formality. The responsibility, however, increases yearly, and expands as the work grows, and our interest in an engaging and delightful calling makes it well

that we should thus annually meet to take stock, as it were, of our position; to review not only the past year, but the years which have gone beyond recall; to see how we stand, to look ahead into the future years, with whatever they may bring us; and, while taking counsel with each other, to encourage ourselves for the great and far-reaching object we have in hand, viz. the advancement of architecture, both as an art and a science.

About fifty-five years ago the Architectural Association, which was then in formation, met in a coffee-house; afterwards in Lyons Inn Hall. The same burning zeal which inspired the founders is, I truly believe, still with us; the flame has in no way become dim; some of the founders are even still with us to-day, among them the venerable and esteemed Professor Kerr. From then till now is over an average lifetime, and the Association is now a full-grown and vigorous body, meeting, by the courtesy of the Royal Institute of British Architects, in this their meeting-room, our proceedings fully reported in an admirable professional press, and possessing a representative journal of its own production, not devoid, I venture to think, of literary merit. We cordially welcome here to-night many old friends, while a still vaster number continue on our rolls, whose sympathy and support are essential to our well-being and progress. Their sons and successors are with us, working with a full and free hand, while, it may be, their grandsons are now in the Student Corps which our roll encloses. The Architectural Association is truly vernal. If you would renew your youth I know of nothing likely to be so invigorating and stimulating as your attendance at one of our annual gatherings. The labours of the Association have ever been of a self-denying character. In early days, and until within quite recent years, when the new educational movement was inaugurated by my distinguished predecessor in this chair, Leonard Stokes, the work of the Association was carried on by mutual self-help of an entirely honorary character. The services thus rendered gratuitously were of a high and valuable order, and many of us here to-night gratefully acknowledge our deep indebtedness for the valuable instruction thus imparted. But what was suitable for that time is wholly inadequate for to-day. Not that the conditions have so changed that we can dispense with the information of the past; but modern requirements are so exacting, and technical facilities offered by public bodies so great, that it became essential, not only to bring our curriculum into line with those institutions, but to place the Association in such a position as to be able to be the head and fountain of architectural education in London.

The establishing of the studio and the renting of the present premises in Great Marlborough Street was an enterprise viewed with fear and misgiving by many members. Those who pressed forward the scheme, fully believing it to be urgently necessary to meet the requirements of the time, may now, however, congratulate themselves on the success which has resulted, and on the benefits which the profession generally has derived from the facilities for study which have been afforded. Those who have passed through this course of training are only too ready to testify to the practical nature of the instruction they have received, and there is every reason to believe that the success of the past will be more than maintained in the future. The general principle of the old classes of design is still maintained, in that the instruction or criticism is of a voluntary nature, conducted by a body of visitors specially invited, whose instruction is of the greatest value and advantage to the students attending the school of design. We are glad that this old and well-proved system still continues, and with such excellent results, in our Association work. We have not yet embarked upon the actual teaching of design in principle and practice, but that this must form a definite item in our programme of the future is not difficult to foresee.

I am happy in having the privilege of recording the most successful result of the first year's work of our newly established day school, which is now in a flourishing and vigorous infancy. The formation of this involved a vast amount of time and thought on the part of my immediate predecessor in the chair, and its successful inauguration must be very gratifying to him. We have been most fortunate in securing as the master Mr. Arthur Bolton, to commence and complete the first year's course. To inspire enthusiasm into the new students, and to fully satisfy the intentions of a committee who were keeping their eyes upon the future of the school, must have taxed the best and most genial of men. Everything has dovetailed in a most admirable way, and the success of the first and somewhat experimental year augurs well for its long and growing influence. The year's work has, however, demonstrated beyond all possibility of doubt the absolute necessity for other and more suitable premises. It needs no little skilful negotiation in our now very confined limits to make everything work with the smoothness so necessary in an educational institution. How difficult this is may be judged from the fact that the day school hours are from 9.45 to 5 and the evening school from 6.30 to 10. It is unnecessary for me to reiterate what has been stated so often from this chair, that the committee are still on the



look out for premises. I ask however for patience, fully expecting to be shortly able to make an announcement which, while fully meeting all our needs, will be gratifying to a degree to our members.

The object of the Architectural Association is to teach—in a measure—architecture, while its lofty aim is the improvement of the art. I do not by this mean to infer that it is possible for us to outshine the brilliancy of the work of the ancients, or of the masters of the Gothic or Renaissance periods. Our object is not to revive this or that period, but rather by the study, contemplation and comparison of that which has gone before us in all that is noble, beautiful and pure, to acquire those principles of proportion, those refinements and elegancies of form and detail which have been the constant admiration of mankind in all ages. By such reflective study we seek to originate an inspiration which will subserve itself to the utilitarian requirements which our day and generation demand from us as architects, form being subservient to purpose, and use put into effect may be so suitably and constructively dressed as to commend its result not only to those who employ us, but to all intelligent and thinking observers of the beautiful and suitable in the greatest of the constructive arts. We feel that the deeper, the wider and the more analytical our study of the work of the past, the better shall we be equipped for the production of original work and the less likely shall we be to fall into the dry and uninteresting groove of the mere copyist. We desire no "new art," casting aside in a moment the traditions of the past, but a steady and rational development on a sure and solid foundation; the same process of development which has produced everything in art which has been lasting and worthy of admiration. Our ideal is no doubt a very high one, and in order to achieve it so far as lies in our power, we have collected for the guidance and instruction of our students (if I may quote from a recent address) "Brains, similar to the collecting of rare books or works of art." In our instructors we have a body of gentlemen of attainments which our predecessors in this Association would have envied. The requirements of the fully-qualified architect cover so wide a range of knowledge and true education is so lacking in most of us, that many are prevented from attaining the best results. We endeavour to bring the average man, who comes to us with his mental capacities trained at a good school, in contact with the best brain power the profession can offer him, and this before bad professional mental habits are formed, which eventually would lead him to wander illogically from pencil to paper, and thence into practical being in a building, which, unlike a picture, cannot be painted out or hidden away from the gaze of mankind. I am not afraid to assert that architecture in this country is cursed by ignorant mental habits which a simple and well-defined system of education would have rendered impossible. Even the genius (there are such, and we are glad to have them, though their percentage is small to the generality of men) may profit in no small degree by the training and knowledge we have to offer him. But it is to the average, not the exceptional, man that I wish more especially to address myself. An employer seeks the services of an architect in his necessity; that man usually is the average man. Generally speaking, it is the all-round man of good average ability who, by dint of long, patient and persistent study, is he who makes the most successful and valued practitioner. Speaking the other day of another profession the President of the British Association said:—"It was in the abundance of ordinary plodding ability, thoroughly trained and methodically directed, that Germany at present has so commanding an advantage." These weighty words abundantly express what it is the object of our Association to provide, and what, I sincerely trust, it is the whole-hearted aim of our students to acquire.

We have no new style to invent. It would be as sensible to invent a new language for the British nation. But as we read Shakespeare, Milton and Addison, or study the elegancies in diction of Lamb, Burke or Bright in writing and speaking in beautiful language, so our endeavours should be to graft upon the construction of our designs such sympathetic qualities as shall form a perfect marriage between the beauty and form of the architectural outlines and the practical necessities and objects of our buildings. Our educational work is not to cram for an examination; far from it. The examinations of the Royal Institute of British Architects do indeed test our work, but are a means, not the end, we have in view. It is to be regretted that crammers do exist. I again quote Professor Dewar's brilliant address, which is singularly applicable to us as architects:—"There are," said he, "plenty of chemists turned out now by our universities, but they are of no use for practical purposes. They are chockful of formulæ. They can recite theories and they know text-books by heart. But put them to solve a new problem freshly arisen in the laboratory, and it will be found that their learning is all dead. It has not become a vital part of their equipment, and they are 'floored' by the first emergence of the unexpected." Now the end of all this is to show that our desire is to make our students learn to think "as a vital part of their mental equipment."

Much has been said, and much more no doubt will be said, on the much-vexed subject of architectural competitions, and I do not wish to enter upon a discussion of the question from its more controversial points of view. I am amongst those, however, who do not regard them as an evil to be fought against, and eventually if possible abolished. The fact that they provide the young and obscure architect with his opportunity seems to me to be sufficient to justify the principle without seeking further for reasons. Almost every argument which has been urged against them has not been so much against the system as against the abuses which have occurred in their conduct; these are undoubtedly preventable, and the remedy lies entirely in the hands of the profession. It is, however, of the educational aspect of competitions that I wish to speak. I know of no better means by which a young architect can acquire knowledge and experience in design than by taking part in a competition for a definite building for an actual site; in no other way can he so well attack the practical, as well as the æsthetic problems, and in no other way can he have an opportunity of comparing his efforts with those of more experienced and practised architects. If, however, he is really to profit by such experience his design must be a serious effort, carefully studied and restudied until it appears to its author to be as perfect as he can make it, until he can conceive no possible objection or fault which is capable of remedy. The brilliant idea, the flash of genius, dashed off in half an hour, never did and never will succeed in a competition. And withal, the young competitor (and I might also add the old one) must always cultivate the habit of self-criticism, and must be always prepared and even anxious to admit his inferiority. He must always have in mind that his task is not merely to find a solution of the problem in hand, but the best possible solution. This, of course, should be the object in all design, competition or no competition, but I fear it is so in comparatively few cases, judging by the work we see around us every day. The principle of competition should give the necessary incentive for the effort required. It is, of course, essential that the conduct of competitions should be beyond all question, and that every possible means should be adopted in the selection to secure the choice of the best design submitted. Matters have greatly improved in this respect of late years, but much still remains to be done. The profession can, if they will, compel promoters to conduct competitions in a satisfactory manner, and all those who are working for this end should have the support of every architect in their endeavours.

Much as architects have to deplore the ignorance and apathy of the public towards their art, I believe there is slowly, but none the less surely, developing a movement towards a better appreciation of architecture. The building public are, I truly think, growing anxious to have real architecture, and are willing to pay for it if they can get it. It is our business to give it them, so far as lies in our power. Public bodies are becoming very keen to have buildings of which they can be proud, and which are not designed merely to serve their utilitarian purpose. One sees occasionally an architectural article in the daily press, evincing nearly always, it is true, an ignorance of the subject positively appalling, but still showing that there must be a desire on the part of the public for information. It is much to be regretted that these articles when they appear are so often incorrect and misleading. We, as architects, may, I think, do much to educate the public in these matters.

Without apology to our seniors, I now wish to address myself more particularly to our younger colleagues, and especially to those members of our day school, whom we are glad to cordially welcome within our ranks. You have entered one of the most fascinating and noble of professions it is possible to select, and with diligence and devotion to your studies you will find your work provide you with many recreations. Art is long, and life at the best short, and you will find much to interest and delight you throughout your career. It is not given to everyone to be a genius born; indeed, it is well that it is not so, inasmuch as many such are impractical and visionary dreamers in a matter of fact world. Your ultimate aim is to become a refined and capable practising architect, and with this in view you will do well to organise your studies into a system which for reference will stand you in good service in after years. Reflect upon what I have said as to the cultivation of the mental habit. Analyse the reason and basis of everything. It is not enough to sketch and draw. You must inquire and investigate as to why this is beautiful, and why that is unlovely. Above all, I would have you not regard your profession as merely a means of livelihood. That, of course, is a necessity, but if you are to excel it must be your recreation, and, indeed, your life. The real and sweetest reward of your labour will always be the appreciation of your fellow-workers, who know so well the difficulties you have had to meet, and can estimate the measure of your success. It is all-important that you should be capable draughtsmen. I do not by this wish to convey the idea that



draughtsmanship is architecture; far from it, it is often the reverse; but by draughtsmanship an architect is able to record his conceptions and to dissect his ideas. A well-known professor of architecture at the Royal Academy, in urging precision, advised his hearers to throw away their india-rubber. I advise you to do the reverse. Do not be afraid of that invaluable means of erasure. Rub in and rub out until you have secured what you believe to be right. Above all things do not work upon an empty head. You might as well work upon an empty stomach and expect to have physical energy and activity. But first feed your mind with examples, reflect upon and analyse these, whether from illustrations or your own recorded sketches. Then put these on one side and conceive what is suitable to the position and character of the subject in hand. You may be only the average man, but by persistent study and patient endeavour, precept upon precept, line upon line, here a little and there a little, you will be able to build up a reserve of information which will be of great and lasting value. Anyway, there is no room in the profession for the lazy man—I hope he is not here to-night—as the rewards which diligence brings have to be sought with love and labour. Your profession calls for some self-denial; it would not be worth much if it did not do so. Perhaps some expenditure of midnight oil may be necessary, but this will not be detrimental if exercised with wisdom and moderation.

The priceless collections in our museums await your inspection and study, together with an appreciative knowledge of the best works of painting, sculpture and the allied arts, both ancient and modern. The same may be said of the ancient buildings of London and the neighbourhood. The best works of modern architects seem to me to be a fruitful and helpful study which is not fully taken advantage of by our students. Our spring and summer visits, so admirably organised, will afford you facilities for going further afield.

It has, I fear, become somewhat the custom to decry the particular value of sketching and measuring, while the standard of draughtsmanship has advanced by leaps and bounds. In recent years it would appear that the healthy habit of sketching is not so universal as it was twenty years ago. I commend it most earnestly to your careful attention. Nothing that I can say will be of so much advantage to you as the systematic and careful collection of figured sketches. I do not mean thereby the production of pretty pictures—a snap-shot will effect that—but the thoughtful study of an ancient feature, with a discrimination which gives, as far as possible, the reason why, is a valuable record; and the fact of delineating impresses the study upon the mind for ever and leaves a permanent influence for good.

The reflective habit should also be cultivated, whether in the contemplation of a noble building or the reading of a notable book. It is a good thing to sit before an old building and drink in its poetry; to cultivate the spirit of true criticism and inquiry. Beauty, like love, is divine and indefinable, but it must be pondered upon and pursued if it is to be secured.

In conclusion, I trust we shall return to our studies and duties after the recess with renewed energies, and that we shall be intent upon carving for ourselves a little niche, and leaving some executed work behind us which shall make the world more beautiful than it was before, and call forth the approval of those who will follow us.

Mr. ASTON WEBB, A.R.A., who proposed a vote of thanks to the President for his address, said it was twenty years ago that he occupied the chair as President of the Association, and his thoughts went back to that time. The address they had heard touched upon one of the points always mentioned on these days—the hope of having new premises. He spoke of a similar hope, and years before that presidents had expressed it. Mr. Hare had now gone further, for he said he would tell them of some scheme for the realisation of such hopes which had arrived at fruition. In his days the presidents were selected from the striving members, now they were elected from the thriving. Another difference that occurred to him was that in those earlier days they looked with some awe on the Royal Institute of British Architects, now the President of the Association was a member of the Council of that body. He said he was very glad that one of his first duties as President of the Institute was to be there that night and express on behalf of the Institute the very great interest that they took in the work that the Association was carrying on. They all recognised that the Association was almost a unique institution among professional bodies. The address alluded to competitions. He could only say that upon that point he entirely agreed with what Mr. Hare had said. The justification for competitions must lie in the fact that they gave the young architect an opportunity for distinguishing himself which might not otherwise come to him. The day school was a matter of congratulation to the Association, inasmuch that its first year had been one of success, and they were most fortunate in the appointment of Mr. Bolton, who had kindly undertaken the management.

Mr. W. H. SETH-SMITH seconded the motion. He said

the address had summed up the work of the Association in all its aims, and by practical suggestions had promised the attainment of them. The keynote of it was the defective system too often adopted in England of teaching a great deal of matter, a vast number of facts and formulae, without evoking the spirit of inquiry and thought which lay at the bottom of all true education. The Association in its efforts sought to remedy this.

Mr. JOHN SLATER, in support of the vote, said he was glad the name of Mr. Leonard Stokes had been mentioned in allusion to the work of the Association. The educational move proposed by Mr. Stokes helped materially to the success of the present scheme. With regard to the new premises, the President had been very reticent, and although he (the speaker) had taken an active part in the selection of site and locality, yet he would follow the President's example and be reticent too.

Mr. C. HARRISON TOWNSEND and Mr. E. W. MOUNTFORD also supported the motion.

### LIVERPOOL CATHEDRAL.

THE following criticism has been prepared by the Liverpool Cathedral petition committee on the reports issued by the Liverpool Cathedral executive committee:—

The Liverpool Cathedral petition committee have had under consideration the reports upon the cathedral recently issued by the executive committee and their advisory architects, and have decided that as the same inaccuracies are again and again advanced by the executive committee, though constantly refuted by the letters and publications of the petition committee and others, it is only necessary at this stage of the cathedral scheme to refer those who wish to inquire into the full truth of the matter to the honorary secretary of the petition committee for copies of those publications and for other information in the petition committee's possession. Attention, however, may very well be directed to the following points, which seem to be made clear by the reports, viz.:—

1. That the general committee, and not the executive committee, were charged by the public meeting "to carry out" the Liverpool Cathedral scheme, yet the general committee have not been consulted by the executive committee for the space of fifteen months, during which period matters of great moment have been decided, a cathedral Bill has been passed through Parliament, and a competition for designs for a cathedral has been held.

2. That, whilst the fact of Sir Alfred L. Jones, K.C.M.G., having seconded a resolution in favour of St. James's Mount site being adopted, at a date when the objections to that site were not so fully known, is set out with great prominence in the report, no reference is made to the fact that Sir Alfred L. Jones subsequently at a large public meeting expressed his disapproval of that site.

3. That it is not stated that the St. James's Mount site was recommended and adopted before the boreholes for testing the foundations were made; that it is not denied that those boreholes were driven as much as 40 feet deep to find solid foundations; that the intended position of the building has again and again been changed so as to endeavour to avoid the bad foundations of the Mount; that a smaller building is now contemplated to be erected, placed as far north of the Mount as possible and partly in the cemetery (which is some 50 feet below the Mount); and that further powers to absorb 2 acres of the cemetery for this purpose have been obtained from Parliament since the Bill was originally presented, in the endeavour to remedy the evils of the proposed site.

4. That, when it is stated that "all opposition has been withdrawn," it is not made sufficiently apparent that this statement only refers to Parliamentary opposition, and no reference is made to the fact that only by a bare majority of three did the City Council approve the sale of St. James's Mount Gardens to the cathedral promoters, and this notwithstanding that the cathedral promoters have members of their body upon the different Corporation committees which advised the City Council in the matter, and that the chairman of the cathedral executive committee spoke, as a member of the City Council, in favour of the resolution under which the sale was effected.

5. That, in regard to the submission of drawings in competition for the design of the cathedral, no mention is made in the reports of the damaging correspondence published in the *Times* which passed between Sir William Emerson, the previously selected architect for the Liverpool Cathedral, and Sir William Forwood, the chairman of the cathedral executive committee; that it is not sufficiently clearly brought out that the competition was open to the whole world, and that a mere total of 103 competing architects represents a very inconsiderable proportion of the architects of England alone, apart from those of the rest of the world; that only thirty-three architects even of this small total sent in designs for a cathedral, and that of these only four architects have been selected to further compete, the fifth architect selected to compete being one who



merely submitted illustrations of parish churches which have been erected from his designs; that, although 1,000 guineas is being paid to the advisory architects for their opinion (which is subservient to that of the cathedral executive committee), only 1,500 guineas is being paid to competing architects for five designs for a cathedral to cost 1,000,000*l.* (representing 5,000,000*l.* worth of architects' services, the scale charges for which would be some 125,000*l.*); that even after all this ill-paid skill and labour have been expended by the five presently selected architects, the cathedral executive committee are at liberty to invite and adopt the designs of other architects who have not incurred the expense and trouble of the first competition; and that in consequence of all these unsatisfactory conditions it seems quite improbable that the best possible design for a cathedral will be forthcoming.

6. That it is now officially announced that the sum promised towards the present scheme is only 154,114*l.* 16*s.* 3*d.*, which effectually disposes of previous misleading announcements by members of the executive committee as to the amount promised; that less than even half of this amount has been paid in; that only 2,696*l.* 4*s.* 9*d.* worth of promises has been received during the past ten months; that these facts are very strong indications of the unpopularity and almost complete lack of public support of the present scheme for a cathedral in Liverpool; and that even the executive committee admit in their report that "much more must be accomplished ere the cathedral scheme" can be "consummated."

7. That the report of the advisory architects, whilst embracing a series of good-natured platitudes, does not offer any serious criticism upon the designs submitted in the first competition, nor gives any practical indication of what a modern cathedral should provide, either for the special needs of the diocese of Liverpool or of elsewhere; that the strictures passed upon those architects who sent in illustrations of executed works are quite unmerited, inasmuch as those architects duly complied with the conditions of competition; that the surprise expressed by the advisory architects because the designs submitted were chiefly "Gothic" seems, when one remembers the expressed preferences of the executive committee, to be quite gratuitous; that the report of the advisory architects sufficiently indicates that what is required by the executive committee, and what the successful competitor will doubtless submit, is a lifeless academic reproduction, strictly in accordance with the "Gothic" manner, and that "our own English phase of the style" will be "adhered to."

8. That a dead site and a dead style seem to be the ideals of the executive committee, but the petition committee have confidence that the public, by withholding their subscriptions from the present cathedral scheme, will prevent ideals so lifeless being attained upon their behalf.

Committee-room (*pro tem*), 6 Dale Street, Liverpool: October 1, 1902.

### THE VENETIAN MONUMENTS.

THE Rome correspondent of the *Times*, writing from Venice, says:—When the Campanile collapsed some Venetian was attributed to one of the architects chiefly responsible for the "preservation" of monuments the remark that he had not foreseen the disaster because "he never thought St. Mark would play him such a trick." Given the close association of the ex-authorities with the local clerical party, the irony is sufficiently pungent, but upon looking into the problem of Venetian monuments as a whole one is forcibly reminded of the painting in which Paris Bordone represents the legend of St. Mark and the fisherman. It is as though the famous Saint had allowed the demons of carelessness and blatant self-satisfaction to throw down his tower in order to wake his city from its lethargy and show it the danger of yet greater evil.

Of all the questions confronting Signor Boni and his zealous coadjutors the reconstruction of the Campanile is the least difficult and the least urgent. True the connection of the fall of the Campanile with the general problem of the subsidence of Venetian soil must be elucidated; but the Campanile, for better or worse, is down, while other monuments, more beautiful and of at least equal historic import, are still standing and call loudly for defence and preservation. St. Mark's, the Doges' Palace, the Procuratie Vecchie, the Zecca and the churches of Santa Maria Gloriosa dei Frari and Santi Giovanni e Paolo need prompt attention, and in some cases drastic treatment, if catastrophe more irreparable than the fall of the Campanile is to be avoided.

How far St. Mark's as an edifice is in danger there are at present no means of ascertaining, though at first sight the marked inequalities in the pavement suggest a doubt whether the soil around the foundations may not have moved. More alarming, because more appreciable, is the great arch of the Apocalypse, which is lighted by the large central window facing the piazza. As one stands on the gallery of the façade, imme-

diately behind the bronze horses, the iron crossbars and framework of the window are seen to have been bent and dragged in towards the interior of the basilica by some displacement of the arch inside. From the internal gallery on the inside of the window, some 30 feet below the centre of the arch, it is easy to notice a crack in the mosaic running from the summit of the window for about three yards towards the interior. The origin of the crack and the extent to which it affects the brickwork of the vault cannot be judged by superficial examination, but the depth of similar lesions in other buildings points to the conclusion that this crack is a phenomenon of which it would be easy to under-estimate the importance. The full extent of the damage suffered by the arch of the Apocalypse is, however, visible only from the top of some scaffolding which has been erected on the inside of the window. At the window end, notwithstanding the crack, the arch preserves its semicircular form, but at the other end it sags downwards several inches, and perhaps a foot. Signor Manfredi, who is now in charge of the basilica, is convinced that all the mosaic of the arch must be removed and the 12-inch brick shell behind the mosaic more solidly reconstructed. He apprehends no immediate danger, and has applied through the ordinary bureaucratic channels for authority to reconstruct. It is to be hoped that authority will be given before any part of the mosaic or of the brickwork collapses.

In the Doges' Palace work has not yet gone much beyond the preliminary stage of investigation, except that the books of the Biblioteca Marciana have been removed from the rooms of the south-east corner, where danger was most apparent. Behind the empty bookcases serious diagonal lesions are visible in the walls, and the spectator feels as though the brickwork were slowly tumbling outwards towards the canaletto crossed by the Bridge of Sighs. The cause of this movement is not far to seek. The same Vendrasco who foretold the fall of the Campanile did not scruple to cut through one of the chief internal walls that run parallel to the façade, to make room for a lift in which the heavier books might be conveyed from one floor to another. Not only did he make an aperture fully 20 feet high and nearly 3 feet wide in this 18-inch wall, but he cut through a massive iron bar by which the wall had previously been braced together. Consequently the whole of the semi-detached portion of the wall between the aperture and the canaletto tends to topple outwards. It is not easy to see how the movement can be stopped, but Signor Boni, who has displayed so much skill in handling the Temple of Castor and Pollux in the Roman Forum, will probably be equal to the occasion. Further lesions, though perhaps of minor gravity, have been discovered in the wall of the Sala del Maggior Consiglio which sustains Tintoretto's mighty "Paradiso." The great canvas must be removed with all care and the wall strengthened. This work is already in progress.

A general examination of the Piazza San Marco has revealed serious lesions in the Procuratie Vecchie, and has necessitated summary measures for relieving and supporting some of the arches. Here also ulterior investigation may prove the general subsidence of Venetian buildings to have been a contributory cause, but it is unquestionable that the wholesale demolition of internal walls and the stacking of heavy merchandise in the rooms above the colonnade have helped to disintegrate the structure. The more dangerous points have now been relieved of pressure, and a scheme for thoroughgoing restoration is being drawn up. The best solution would probably be to expropriate the whole of the Procuratie Vecchie and treat them henceforth as a public monument.

The work on the Palace of the Doges and on the Procuratie Vecchie is in the hands of the Regional Bureau for the Preservation of Monuments—that is to say, of Signor Boni and of his efficient lieutenant, Professor Ongaro, who holds the chair of technical architecture at Padua University. They may err on the side of caution and minuteness, but they are not likely to fall into the gross mistakes now being committed by the Genio Civile in the Palazzo della Zecca. The Biblioteca Marciana is to be removed from the Doges' Palace because the weight of the books and manuscripts jeopardised that building, and the Civil Engineering Corps some time since fixed upon the Zecca as the aptest premises for the homeless library. One would therefore have supposed that the Zecca is stronger than the Doges' Palace. On the contrary, the Zecca is rickety from top to bottom. One wall is leaning outwards towards the garden of the Royal Palace; great cracks gape lazily in most of the rooms; a massive stone lintel has been split vertically by the disruptive force of the building; a vaulted ceiling intended to support a room above has had, in its turn, to be propped up by heavy beams, and workmen are now engaged in plugging the worst places with a few new bricks and in plastering cement into the widest fissures. So great is the tendency of the place to fall to pieces that a large hooked iron bar with which former restorers attempted to hold two walls together has snapped under the strain. The Civil Engineering Corps could imagine no better expedient than to place a second hooked bar over the one that has snapped, in the fond



hope that it may prove more efficacious than its predecessor. It is quite in keeping with the general style of these operations that the work of "restoration" should have been begun in the third storey and continued downwards. A man might as well hold himself by the hair to save himself from falling. The only solid place in the building is the old treasure-room, built in massive masonry and containing the splendid old Republican money chests. These chests it was proposed to sell as old iron. After such would-be vandalism it is not surprising that this incomparable Genio Civile should be preparing to roof in the Renaissance courtyard before arranging it as the reading-room of the library. The courtyard contains a deep well with a monumental well-head—at which, no doubt, students who may care to risk their health in the place will be able to damp their ardour. When roofed in, the courtyard will be deprived of air and light, and the rooms on the first and second floors, in which it is proposed to store the books, will be darkened, so that their contents may moulder more rapidly. The fine, well-lighted rooms in the front of the building, which look across the Canale di San Marco, are naturally reserved for the administration. Is it not the chief purpose of a library to provide snug quarters for its managers? The foolishness of the Zecca scheme is qualified only by the probability that the place will tumble to pieces before the library can be opened. It is really high time for the responsible authorities in Rome to put a stop to this expensive blundering, and if they do not care to incur the outlay of demolishing and rebuilding the second and third storeys, they will be wiser to leave their books piled up in some out-of-the-way corner than to squander public money in preparing a new catastrophe.

The state of the churches of Santa Maria Gloriosa dei Frari and of Santi Giovanni e Paolo inspires scarcely less disquietude than that of the Zecca. At the Frari the campanile has sunk at least 18 inches, and has dragged with it one side of the edifice. At Santi Giovanni e Paolo the imprudence of the ecclesiastical authorities in cutting away parts of the masonry to make room for tawdry side-altars has endangered the whole of one side of the church, while the sinking of the subsoil, or some other unknown cause, has twisted and bent the huge column which supports the north-west angle of the nave and the transept. Signori Boni and Ongaro have devoted the greatest attention to these two edifices, but it is doubtful whether all their pains will avail to save Santi Giovanni e Paolo. In the case of the Frari success is more probable, though by no means assured. In consequence of the work at the Frari, Gian Bellini's famous Madonna has been temporarily removed from its place in the sacristy and placed in a new light. The marvellous beauty of the picture is vastly enhanced by the change.

The problem of widest interest which Signor Boni and his colleagues are attempting to solve is that of the general subsidence of Venetian soil. The rate of subsidence can be determined only in relation to the sea-level, and the present level has already been marked by them at various points of all the monuments now in course of treatment. By establishing standard marks on these monuments and on all the islands in the lagoons, and by testing them periodically, it will be possible to ascertain the rate of future subsidence, while comparison with the standard marks on the Alps should reveal approximately the rate of subsidence in the past. Previous investigations lead Signor Boni to believe that the land has sunk at the rate of nine centimetres per century. A standard mark has been discovered on the lowest steps of the basement of the fallen Campanile. This mark was made by the military engineering corps twenty years ago, and unless the foundations of the tower have been displaced by the fall of the superstructure the mark should contribute to the solution of the general problem. As soon as the debris of the fallen Campanile have been completely cleared away an excavation will be begun around the piles upon which the tower rested. It will then be possible to see if and how any movement of the foundation hastened the fall of the structure, and further data as to its relation to the sea-level will probably be obtained. Meanwhile examination of the debris has thrown interesting light on the history of Venetian building. Splendid Veneto-Roman bricks, made at Aquileja in the first and second centuries, have been found in the masses of inferior material that fell from the tower. In quality these bricks surpass the best bricks of ancient Roman edifices and successfully resist a pressure of 300 kilogrammes per square centimetre, whereas the best modern Venetian bricks (not artificially compressed) cannot withstand a pressure of 50 kilogrammes. It is Signor Boni's intention to discover, if possible, the clay of which these Veneto-Roman bricks were made and to use it in the reconstruction of the Campanile. Apparently the Venetians, when driven by the barbarians to take refuge in their lagoons, lost the Roman tradition of building and forgot, moreover, the art of making good mortar. Thus the lower portion of the Campanile (900-1300) was built with bad mortar, and it was not until the conquest of Padua

by Doge Michele Steno in 1404 that a good quality of mortar was again introduced. Consequently the upper and later parts of the Campanile fell in solid masses, while the lower parts crumbled into dust.

Students and travellers, inspired by solicitude for the preservation of Venetian monuments as an important part of the artistic patrimony of Italy and the world, may feel assured that, except in the case of the Zecca, all that can be done is being done to preclude further loss. Great credit is due to Signor Nasi, Minister of Public Instruction, for the energy and promptitude with which he intervened as soon as the gravity of the situation became apparent. Local cliques and intrigue are strong in Venice. He rode rough-shod over them, and gave full powers to the one man in Italy who is qualified by experience and local knowledge to act discerningly. Doubtless Count Balenzano, Minister of Public Works, will clip the wings of the Genio Civile as soon as he knows what is being done at the Zecca. In regard to the preservation of Venetian monuments, Italy is on her trial before the cultured world. Those who best know how keen is the Italian sense of dignity, and how sterling the Italian character, feel most certain that she will come safely through the test.

### THE OLD CHURCHES OF NORTHAMPTON.

THE Church Congress is this year being held in a town and district, says the *Guardian*, which are replete with exceptionally interesting churches of ancient foundation. Like all English Mediaeval towns, Northampton used to be remarkably well supplied with churches for general worship, apart from those connected with hospital foundations, or of a conventual character. Within the walls were the seven parish churches of All Saints, St. Sepulchre's, St. Peter's, St. Giles's, St. Gregory's, St. Mary's and St. Michael's, as well as St. Katharine's, which was used at plague times for infected persons. Immediately outside the walls and really forming part of the church accommodation of the town, were the churches of St. Edward's, St. Leonard's, St. Margaret's, St. Bartholomew's and St. Lawrence's. Of all these old fabrics only four remain, namely, the first four of the parish churches just named.

The terrible fire of 1675—second only in the magnitude of the disaster to the Great Fire of London—destroyed almost the whole of the central church of All Saints. The inhabitants aided its destruction by heaping it full of their furniture and goods in the early hours of the conflagration. The following pathetically brief entry is all that the parish registers have to say upon the subject:—"While the world lasts remember September the 20th, a dreadful Fire; it consumed in a few hours 3 parts of our Town and Chief Church." To the rebuilding of the church, which was opened on September 5, 1680, the nation at large contributed. A table of benefactions towards the rebuilding still hangs in the consistory court, but is rapidly becoming illegible. The new church covers a considerable area, but is insignificant in its proportions compared with its predecessor. The tower, which now stands at the west end of the fabric, is in the main the old central tower of the former church, the nave of which used to extend right across the street to the west. The discolouration of the stones of the narrow tower arches by the fire can easily be seen in the interior. The only other part of the old church remaining is the crypt, or charnel-house, under the present chancel. It is not, however, worth visiting, as it has been so much altered to accommodate modern heating apparatus. It is somewhat remarkable that the name of the architect of the new church is unknown. Four lofty pillars of good proportion support a domed roof, which is a remarkably good example of seventeenth-century plasterwork. The great west portico, which gives some dignity to the building, was not completed until 1701. The absurd statue of Charles II., in toga, greaves and long flowing wig, was placed there in 1712; it was originally painted and gilded, but happily the weather has removed all traces of this colouring. The building underwent a considerable alteration in 1865-66. By a most unhappy decision the chancel screen, which was particularly handsome of its kind and formed a central feature of the original design, was removed. Most of its component parts have been worked up into the three entrance doorways from the vestibule into the church, so that its reconstruction would be a possibility.

Another extraordinary incident in connection with this restoration was the ejection of the monumental statue to Mr. Spencer Perceval, England's Prime Minister, who was assassinated in the lobby of the House of Commons in May 1812. His connection with the town was most intimate and of long standing; he had been its deputy-recorder for twenty-one years, and represented it for sixteen years in Parliament. The Corporation subscribed the sum of 1057. "for erecting a monument in All Saints Church." Upwards of 2,000*l.* was raised throughout the country. The work was placed in the hands of



the famous sculptor Chantrey, was completed in 1817 and placed in the chancel of the church. The statue is considered by competent judges to be amongst Chantrey's best efforts, but within fifty years of its erection it was thrust out, and remained for many years in the gloom of the town museum. The statue now stands in the council chamber of the town hall in a singularly bad light, and is but very rarely seen. Spencer Perceval was a devoted adherent to the Church of England, and when in office passed various measures for her benefit. Is it too much to hope that the meeting of the Church Congress in the town may stir up some of the good townfolk to replace this monument within the building for which it was designed? Fairly good accommodation for it might be found in the consistory court on the south side of the vestibule.

The most interesting old church remaining in the town is that of St. Sepulchre. Of the eight round churches so constructed in imitation of the great shrine over the Holy Sepulchre at Jerusalem that there used to be in England, four still remain in use, namely, those in London, Cambridge, Little Maplestead and Northampton, whilst the round chapel in the middle ward of Ludlow Castle is in ruins. The other three have disappeared. The Northampton round church is by far the most valuable of those that were extant. It was founded by Simon de St. Liz, Earl of Northampton, about 1100, shortly after his return from the Holy Land on the capture of Jerusalem towards the close of 1099, and was probably completed by 1108. The idea at one time prevalent and perpetually insisted upon, that this church was founded by the Knights Templars, is now definitely exploded. The order of the Templars was not established in England until 1134, when this church had already been for nearly twenty years in the hands of the Cluniac monks of the adjacent house of St. Andrew's. Even now, in the round, a tall aumbry or wall recess, doubtless designed to accommodate the processional cross and banner staves—there is another example at Earls Barton, and numerous ones in Norfolk churches—is pointed out as the place where the knights deposited their lances when they came to worship. Another strange notion, still clung to by some of intelligence, is that this church was originally a Jewish synagogue. It so happens that in the case of Northampton the exact site of the old synagogue, outside the walls and across the river at St. James's End, is known. This church is on the site of an older pre-Norman building; not a few of the stones in the Norman part show traces of Saxon zigzag dressings, and in the porch on the south side a Saxon sundial has been built up. East of the round—which served, as at Jerusalem, as a vestibule to the church proper—was a small church or chancel of three bays with an apse at the further end. The north, and subsequently the south walls of this building, were pierced with arcades to open into aisles of later addition. Traces of the original Norman lights can still be seen, as well as the corbel-tables over the arcades on each side, which used to be on the outside of the original building. The round was lighted by two tiers of twelve small round-headed windows, the lower tier opening direct into the building, whilst the upper tier gave light to the triforium above the groining of the circular aisle. The original small Norman clerestory would doubtless be also lighted with small windows, as in the severely restored example at Cambridge. Only one of the lower tier and two of the upper original windows remain in use, but the blocked-up portions of others can be readily detected. About A.D. 1200, or a little earlier, the church was enlarged by the addition of a north aisle to the chancel. St. Thomas of Canterbury was closely connected with Northampton, and one of the most stirring scenes in his dramatic life took place within a stone's throw of this church in the great monastery of St. Andrew. It has been reasonably conjectured that this aisle was built soon after his canonisation to accommodate a dignified altar to the memory of this famous archbishop. About 1275 another large aisle was thrown out to the north of its predecessor, which was pulled down in post-Reformation days and rebuilt in the prolonged restoration work which began in 1860. Towards the end of the fourteenth century many alterations and additions were made to this church; they were carried out on so extensive a scale that they dwarfed the original design of the round and destroyed the effect of its proportions. A fine west tower, surmounted by a spire, was erected against the round; its clerestory was removed and rebuilt, and pointed arches were substituted for the massive semicircular ones that had previously banded together the eight great columns. An outer founder's arch on the south side of the round was then inserted for the benefactor who effected all this change, but it does not seem to have been ever occupied. This church is throughout well worthy of close inspection; it is always open, well furnished and in beautiful order. There is one strange eccentricity about the modern fittings. The handsome new font in the centre of the round has a well-designed font cover; but this cover, for some strange reason, is rendered useless and foolish-looking by being always suspended some considerable height above the font itself.

St. Peter's Church, which stands near the London and North-Western Railway station, at the western extremity of the town, is a most beautiful and in some respects unique example of late enriched Norman. There has been not a little difference of opinion as to the actual date of the work, but there can be no doubt that it was erected on the site of an older stone church of pre-Norman construction in the latter half of the twelfth century. The capitals of the piers of the arcades on each side are delicately wrought with a profusion of characteristic carving. The comparatively slender piers, which afford a great contrast to those of the round of St. Sepulchre's, have projecting bosses half-way between the capitals and the bases; this is a most unusual feature; one of the few other instances is in the shafts of the elaborate late Norman doorway of Wroxham Church, Norfolk. The clerestory is handsomely arcaded. This church, too, merits the closest attention. Great care was taken with its restoration in 1850-52; but it would have been done on far better lines had the restoration been delayed for a few decades. The east end is entirely new. Originally the church obviously extended further west. The Norman work of the present west front was replaced there in pre-Reformation days. It is usually stated by those who are forgetful that every church and churchyard were sanctuaries, that St. Peter's had sanctuary privileges attached to it. This blunder probably arose from some misconception as to the peculiar privilege attached to this church as early as the thirteenth century. Any townsman accused of crime, who intended to try and clear himself by canonical purgation, was obliged to do so in this church and to spend the previous night here in vigil and prayer. It is of some interest to remember that when Henry VIII. did away with the general sanctuary privileges that attached to every consecrated building and to certain districts, such as the parishes of Westminster, Beverley and Beaulieu, he conferred sanctuary rights for minor offences on eight specific towns in different parts of the kingdom, of which number Northampton was one.

The fourth old parish church of the town is that of St. Giles's; churches of that dedication were usually outside the walls of cities and towns, and this was the case of Northampton until the borough walls were extended on the east about the year 1300. It is a large cruciform structure, with central tower, erected originally without aisles at the close of the twelfth century. The church has undergone much restoration and enlargement, but still possesses certain original features of the successive styles of English architecture.

The chapel of the old hospital that bore the double dedication to St. John the Baptist and St. John the Evangelist, and a portion of the old buildings, still remain in Bridge Street. This chapel was for a long period used by others than the hospital inmates after a quasi-parochial fashion. Unhappily it was sold, with the rest of the buildings, to the Midland Railway Company, but it was repurchased and is now in the hands of the Roman Catholics.

The county of Northampton, it is scarcely necessary to say, is deservedly famed for the beauty of its churches, and particularly for the gracefulness of their spires. On the railway line that stretches up the valley of the Nene from Northampton to Peterborough there is a station every two or three miles. The ecclesiologist can alight at any one of these and take any road either east or west, and he is sure to be abundantly satisfied with the churches that he will ere long encounter. If pre-Norman architecture attracts him he will not fail to visit Earls Barton, where there is also a wealth of Norman work; and a few minutes' journey on the Market Harborough line will bring him to Brixworth, a church of literally unique interest, where three separate dates of pre-conquest work are to be detected.

#### LIVERPOOL ARCHITECTURAL SOCIETY.

THE first ordinary meeting of the fifty-fifth session was held on Monday evening, the new president (Mr. John Woolfall) presiding over a large assembly of members.

In his opening address the President referred to the incorporation of the Society last year with the Royal Institute of British Architects, an event which would, he maintained, be far-reaching and important both to the members individually and the Society. A notable function during the coming year would be the holding of the annual conference of the Royal Institute of Public Health in Liverpool next July. The proceedings would be of the utmost interest to architects, and he trusted that among the subjects discussed would be that of the prevention of smoke in great cities. This problem must be faced by the municipal councils in the same determined manner, and with like results, as that of drainage, removal of refuse, pure water supply, artisans' dwellings, &c., for the public benefit and health. That this black cloud should be hanging about destroying health and everything else it touched could not be tolerated much longer. It was a filthy and dangerous nuisance. If remedial measures could be accomplished he be-



lieved it would beneficially influence architecture to a very great extent, and possibly coloured studies of permanent decorative materials would then partially supersede the columns, &c., of the present stone construction. The public improvements which were now being so vigorously proceeded with in Liverpool were providing opportunities for their architects to beautify and enrich the city, and he thought they were proving themselves well worthy of the opportunities. Dealing with the cathedral question Mr. Woolfall expressed delight that the city had decided to have a cathedral worthy of its position as one of the great cities of the kingdom. This effort, he remarked, "will be one of the greatest modern monuments that has been attempted since the Reformation, and will in time to come be a realised certainty. You may probably remember that this Society opposed the site now adopted, but our proposal was overruled on the plea of expense. The St. James's site is now settled, the preliminary competition has also been decided and the names of the competitors selected, and it is a matter for congratulation that our county town (Lancaster) has a firm of architects who have been chosen, and that one of the members of our own Society has won the honour of being highly commended for his scheme. May the final result be worthy of religion, its beauty a glory to our city; may it excite the public to possess one of the finest religious edifices in the world, the most perfect example of the most perfect period of art, being best fitted for the Christian worship of the present day. May all of us see the happy day when the foundation-stone of such a temple is laid, and may some of the present generation see it realised."

On the motion of Professor Simpson a hearty vote of thanks was tendered to the President for his address.

Subsequently a revised schedule of charges was submitted for discussion and approval.

### LONDON COUNTY HALL.

ANOTHER report has been prepared by the special committee upon the subject of the site of the proposed new offices of the London County Council on Adelphi Terrace. According to a special report of the finance committee, dated October 1, the acquisition of the site necessitates an outlay of 900,000*l.*, involving a charge of 44,500*l.* per annum on the county rate for interest and sinking fund. In addition, there would be the cost of the buildings to meet, but nothing whatever has been determined upon this head. But against it may be set the saving to be effected in annual rents paid for the present offices, about 18,500*l.* a year, allowing for an estimated rent of those properties of which the Council has freeholds or long leaseholds. The finance committee are of opinion that the advantages to be derived from the concentration of the Council's offices would, even from a financial standpoint, warrant a large expenditure on the provision of suitable accommodation. In justification of the proposed outlay the special committee give particulars of the present scattered offices in the tenancy of the Council. Of the 897 members of the staff at the central offices 386 are accommodated in the main buildings and 511 in outside offices. Much inconvenience is the natural result.

The area required on the Adelphi site is a little over three and a third acres. It is bounded on the north by William Street, the Tivoli Music Hall and Adam Street; on the south by the Embankment Gardens; on the east by the Hotel Cecil, and on the west by York Buildings. The work of extension could be confined to that portion of the site lying between the Embankment Gardens and John Street, and would probably necessitate (1) the widening of John Street from 38 feet to 50 feet, and (2) the widening of the street known as York Buildings from about 28 feet to 55 feet, in both cases the setting back being on the side of the road next the building; (3) the closing of part of Adam Street, (4) the closing of Adelphi Terrace, and (5) the closing of Robert Street. The clearance in view would entail the demolition of three hotels. A central entrance might be made to the county offices in John Street, the principal floor being about 7 feet above the general level of the street. On this floor there would be ample and suitable space for the Council chamber, lobbies, committee-rooms, members' rooms and the rooms of the chairman, vice-chairman and deputy-chairman of the Council, and those officers in immediate connection with the administrative work of the Council. Below the principal floor would be two floors of offices and above the principal floor five floors of offices. The committee regard it as desirable to keep the principal floor of the new offices at a uniform level throughout the buildings, for as this is necessarily of a greater height than the other floors any change in its level would disturb the horizontal lines of the elevation and necessitate steps in the corridor. If the principal floor is kept at slightly above the Strand level throughout it would be about 30 feet above the Embankment. This would admit of a projection containing two storeys of offices, and could be so treated as to form a

terrace along the entire south façade of the building and form an important access from the Embankment Gardens. The County Hall could thus be approached on the north from the Strand by way of Adam Street and John Street and from Villiers Street by Duke Street and York Buildings, and on the south from the Embankment Gardens.

Should an extension be made to that portion of the site lying between John Street and the northern boundary of the property, additional office room could be found for 150 officials, or 850 in all, 700 finding accommodation in the buildings fronting the Embankment. As to the cost—900,000*l.*—of acquiring the freehold with possession of the properties, the committee state that, compared with other sites which have been considered, the cost would be extremely moderate, and such a favourable opportunity as now presents itself is not likely to occur again. Since 1890, when the Council obtained Parliamentary power to borrow money to provide a site, eleven sites had been considered, including that of Christ's Hospital, one on the Victoria Embankment—east of the Temple Gardens—Barnard's Inn, a plot near the British Museum, Millbank Prison, the Foundling Hospital, warehouse property in Fenchurch Street, the site now occupied by the Hôtel Cecil, an area between the Horse Guards and New Scotland Yard on the Embankment, Farringdon Market and Parliament Street, between Great George Street and Charles Street. In the majority of these instances the sites are no longer available. The committee point out that the Adelphi site possesses many advantages architecturally, inasmuch as it will be bounded by three open sides and will be capable of simple and convenient planning. Moreover, it would have a frontage towards an insured open space under the control of the Council, and opening upon the river. This river façade would be equal in length to that portion of the Carlton House Terrace between the present London County Council offices and the Duke of York's Column. In the second place, the committee put forward the recommendation that the site is a central one, easily accessible and extremely quiet, and has a north and south aspect. In reply to the objection that it would be placing the County Hall in, so to speak, a back street, the committee, while admitting that the objection is a strong one, argue that it does not apply to the present scheme, as the Council will be able to use the important frontage opening upon the Embankment Gardens and the river. Also they point out that during recent years the London School Board, the Metropolitan Asylums Board, the Thames Conservancy and the Metropolitan Police have located themselves on the Embankment. The selection of the proposed site for a County Hall would still further identify the Embankment as the recognised quarter for public buildings, while the existence of Somerset House and the Houses of Parliament on the same frontage adds further importance to this significant characteristic. Finally, this is the last opportunity of obtaining a central site of this dimension facing the river.

### BERKS ARCHÆOLOGICAL SOCIETY.

THE members of the Berkshire Archæological Society, with several members of the Newbury Field Club, recently made a very pleasant excursion to Hungerford, Littlecote House, Avington and Welford. The weather fortunately was fine, and the day's excursion was much enjoyed. The party left Reading soon after ten o'clock for Newbury, where they were joined by the Newbury contingent, and proceeded to Hungerford, at which station brakes were in waiting to convey them to the interesting historical estate at Littlecote, the house of which is one of the oldest and most remarkable specimens of an Early Tudor mansion probably in England. It was originally built by the Darell family, but about the year 1593 the estate came into the possession of Sir John Popham, whose descendants still own the property, which is, however, now occupied by Mrs. Adolph Hirsch. On arrival at Littlecote Mr. Walter Money acted as cicerone, and conducted the party through the various apartments, and explained to them the many objects of interest. The great hall is about 46 feet in length and 25 feet in width, and on all its walls are various coats of armour, helmets, ancient carbines, accoutrements, &c. The long gallery and other parts of the mansion were also inspected with much interest, together with the numerous old paintings and portraits which adorn the walls. After spending a considerable time at Littlecote the party drove back to Hungerford, where lunch was partaken of at the Three Swans hotel. After lunch they adjourned to Hungerford Corn Exchange, where an interesting lecture on the history of Hungerford was given by the Rev. P. H. Ditchfield. The mayor (Mr. W. G. Alexander) took the chair, and welcomed the members of the Society to Hungerford. On the proposition of Mr. C. E. Keyser, seconded by Lord Saye and Sele, hearty votes of thanks were accorded to Mr. Ditchfield for his lecture and to the Mayor for presiding.



After leaving Hungerford, the excursionists drove to Avington, where they inspected the little Norman church there, the principal objects of interest in which were pointed out by Mr. Keyser, who remarked that Avington Church probably contained some of the truest and best specimens of Norman work to be found in Berkshire.

From thence they drove to Wickham Church, where they were met by the Rev. A. and Mrs. Batson, who kindly entertained the visitors to tea in the parish-room, after they had inspected Wickham Church. After tea Welford Church was visited, where Mr. Keyser again pointed out the chief features of interest.

About 6.20 the excursionists took the train at Welford Park station, on their return to Newbury and Reading, which latter station was reached about half-past seven.

## Correspondence

### Working Men's Dwellings, Alexandra Park.

SIR,—In your paper this week you give a long, detailed account of working men's dwellings in Glasgow, another of the amount of buildings erected during the past year, and a third of a vast drainage scheme for the same city, all of great interest in their own place; but what about the competition for schemes of working men's dwellings to be erected upon the Alexandra Park Estate, designs for which were sent in as long ago as February last and not adjudicated on unto this day—what about them and the architects who spent so much time and labour in preparing them? Are they never to be heard of again, or are they really lost to sight, as a professional paper spoke of them some time ago?—I beg to remain, Sir,

October 4, 1902.

QUERIST.

### GENERAL.

**The Architectural Association of Ireland** held their annual meeting on Tuesday. Mr. F. G. Hicks, the president, was chairman.

**Two Operating Theatres** have been added to the Liverpool Royal Infirmary from the designs of Messrs. A. Waterhouse & Son.

**An Exhibition** of works and designs by members of the Guild of Handicraft will be open for a week in the Woodbury Gallery. The private view will be to-morrow.

**The Druidical and Roman Remains** in the Yorkshire West Riding it is recommended should be placed where practicable under the guardianship of the County Council.

**At a General Assembly** at the Royal Society of British Artists, on Monday last, the following were elected members:—B. Haughton, W. J. Laidlay, A. M. Talmage and T. A. Falcon.

**The Surveyors' Institution** will hold the first ordinary general meeting of the session 1902-3 on Monday, November 10, when the president, Mr. Arthur Vernon, will deliver an opening address. The chair will be taken at eight o'clock.

**The Mayor of Orange** and the official commission have given permission for a series of theatrical performances in the Roman theatre of the city. They will be under the direction of Madame Caristie-Martel, whose uncle had charge of the restoration of the ancient ruins.

**Mr. Roosevelt** has arranged to have his portrait painted by Mr. John Sargent, R.A. The *New York Herald* says that Mr. Sargent is coming over in the course of a few weeks, and that the first sitting will be some time in November.

**The Roman Catholic Church** of Colchester is to be enlarged as a memorial to the late Dean Lucas, of that town. Cardinal Vaughan has approved of the plans, which provide increased accommodation for 100 persons at an estimated cost of 7,000*l*.

**The Clergy and Artists' Association** for the Improvement of Art in Churches, instead of holding their usual exhibition at the time of the Church Congress, will hold an exhibition this autumn in New York and the principal cities of the United States and Canada in connection with the Architectural League of New York. The exhibition will consist of reproductions of work executed in this country for churches under its auspices, including painting, sculpture, glass, architectural work, metalwork, embroidery, &c.

**M. Octave Gréard**, vice-rector of the Academy at Paris, having resigned his office, has presented to the Carnavalet Museum several objects which were found during the excavations on the site of the ancient Sorbonne. They include Gallo-Roman vases, sculptured stones and objects produced in the reigns of Louis XIV. and Louis XV.

**Stepney Borough Council** is to receive a grant of 1,000*l*. a year from the Government in lieu of rates on account of the Tower of London. The same body has decided to borrow 13,000*l*. for the purpose of improving narrow streets in Limehouse.

**The Local Society** for the prevention of consumption at Newcastle have decided to build a sanatorium for consumptive patients in Northumberland and Newcastle. The proposed building is to accommodate fifty patients, and will cost 50,000*l*.

**Mr. A. W. Ackermann, C.E.**, has dissolved partnership with Mr. W. Adamson in Cape Colony, where he has practised for twenty-six years. His business address is 47 Victoria Street, Westminster, S.W.

**The Bridge** over the Thames at Richmond has become so inadequate and unsuitable for its heavy and increasing traffic as to be dangerous to the public. The subject is referred to the general purposes committee of the local Council to consider and report as to the best means of securing the construction of a new bridge by the County Councils of Middlesex and Surrey, either on the site of the existing structure or in such other situation as may best conduce to the safety and convenience of the travelling public and the prosperity of the borough.

**The Late Mrs. Jane Ann Maldstone Smyth**, of London, has bequeathed several portraits to the Duke of Argyll, in trust for his Majesty the King or his successor. They include portraits of Carolina Matilda, Queen of Denmark; Sir Robert Murray Keith (1730-95), Ambassador at Copenhagen and Vienna; another of Sir Robert with two of the Court ladies, and a miniature of Marie Antoinette.

**The Foundation-stone** of a church at Eastney has been laid by the Bishop of Guildford. The building will cost 7,500*l*., but at first the permanent chancel will be carried out at a cost of about 3,000*l*. Mr. J. T. Lee is the architect. The style is Early English, and the church when completed will accommodate 800.

**A New Building** in Tooley Street is to take the place of the police-court in High Street, Borough. At the present time the contractors are engaged on the foundations, and the new structure, which will be one of the best in the Metropolis, will be completed in about two years. A police-station will be erected adjoining to take the place of Bermondsey Street station, which for a long time has been recognised as far too small and inconvenient to meet the needs of the locality.

**The Agent-General** for New South Wales has addressed a letter to the Westminster City Council offering, for experimental purposes, 9,000 New South Wales hardwood blocks (3,000 each of black butt, tallow wood and box) with a view to a practical test as to their value for road purposes as compared with the American blocks now being used in London, and suggesting that the blocks should be laid side by side with an equal number of other timbers now being used in the city, if possible, where the traffic is of the heaviest and most constant description.

**The Baguley Sanatorium**, erected by the Withington Urban District Council for the treatment of infectious diseases, was publicly opened by the Earl of Derby on Saturday afternoon. The situation of the hospital at Baguley is a most favourable one, as the institution stands 155 feet above the sea-level, and is surrounded by a fine expanse of open country. Although the site contains over 38 acres, at present 12 acres only have been enclosed for hospital purposes. Within this area there are five separate blocks of buildings, providing accommodation for fifty-six scarlet fever patients, thirty-six diphtheria or enteric fever patients, and eight isolation beds. There is also an administration block, containing rooms for the resident doctor, matron and twenty-five nurses. In the kitchen block provision is made for twenty-two servants, and there is ample space for use as store-rooms. The buildings, though plain, are of substantial character, and the interior arrangements are very complete.

**A Good deal** of feeling has been aroused in Guildford by a proposal recently adopted by the Town Council, which, if carried out, will involve the demolition of the old Corn Exchange, one of the most distinctive features of the picturesque High Street. This building, which stands immediately opposite the quaint town hall, with its clock projecting over the street, was erected at the beginning of the last century. For very many years the assizes for the county were held in the building, and it was here in 1860 that after some remarkable proceedings the then high sheriff, Mr. W. J. Evelyn, of Wotton, was fined 500*l*. for contempt of court by the Lord Chief Justice Cockburn. The Town Council have recently erected a new corn exchange in the cattle market, and in order to widen the road known as the Tuns gate, and make a better approach to Pewley Hill, it is proposed to remove the Corn Exchange and other buildings.









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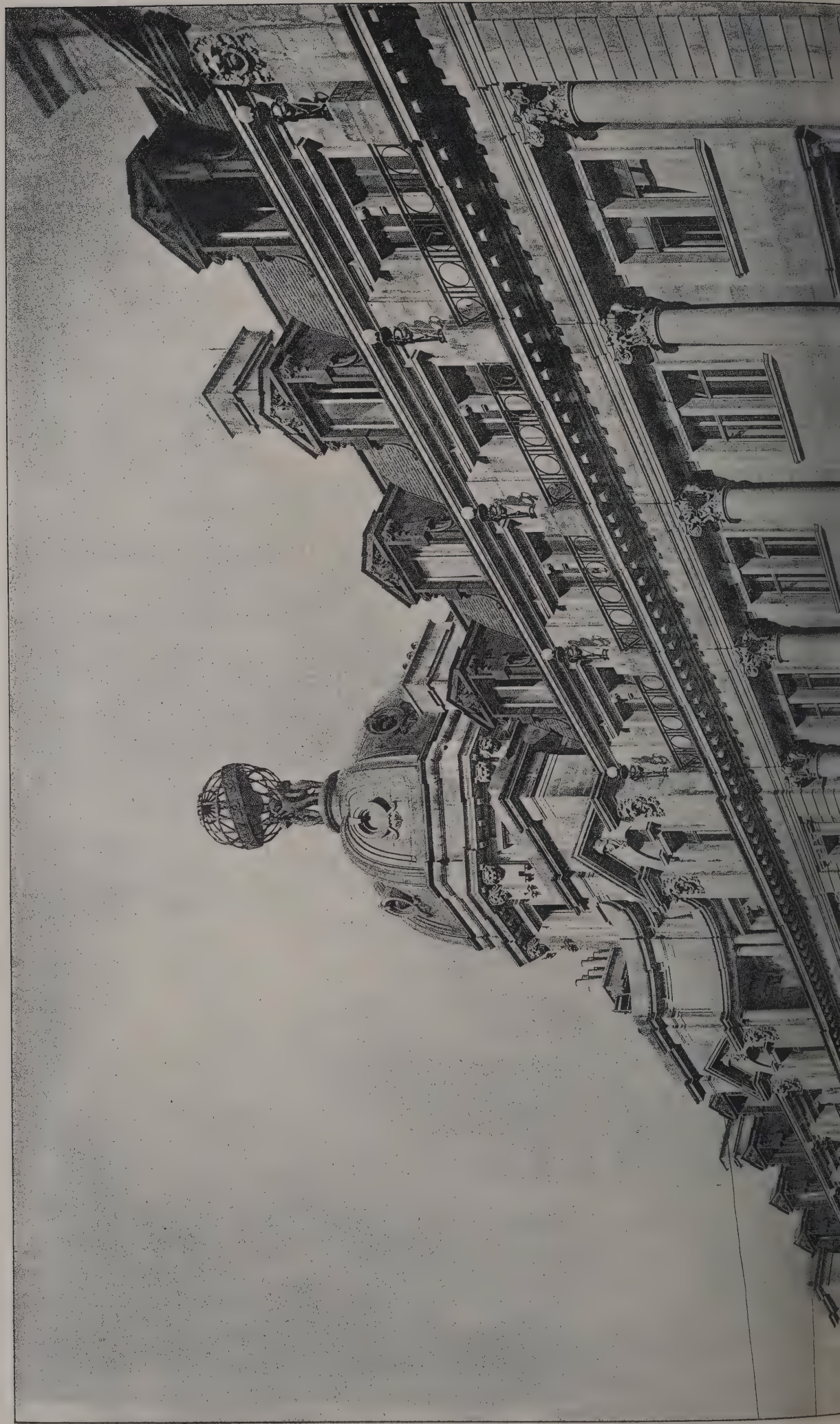
LOMBARD STREET, SHOWING BANKERS' SIGNS.







The Architect, Oct 10<sup>th</sup> 1902.







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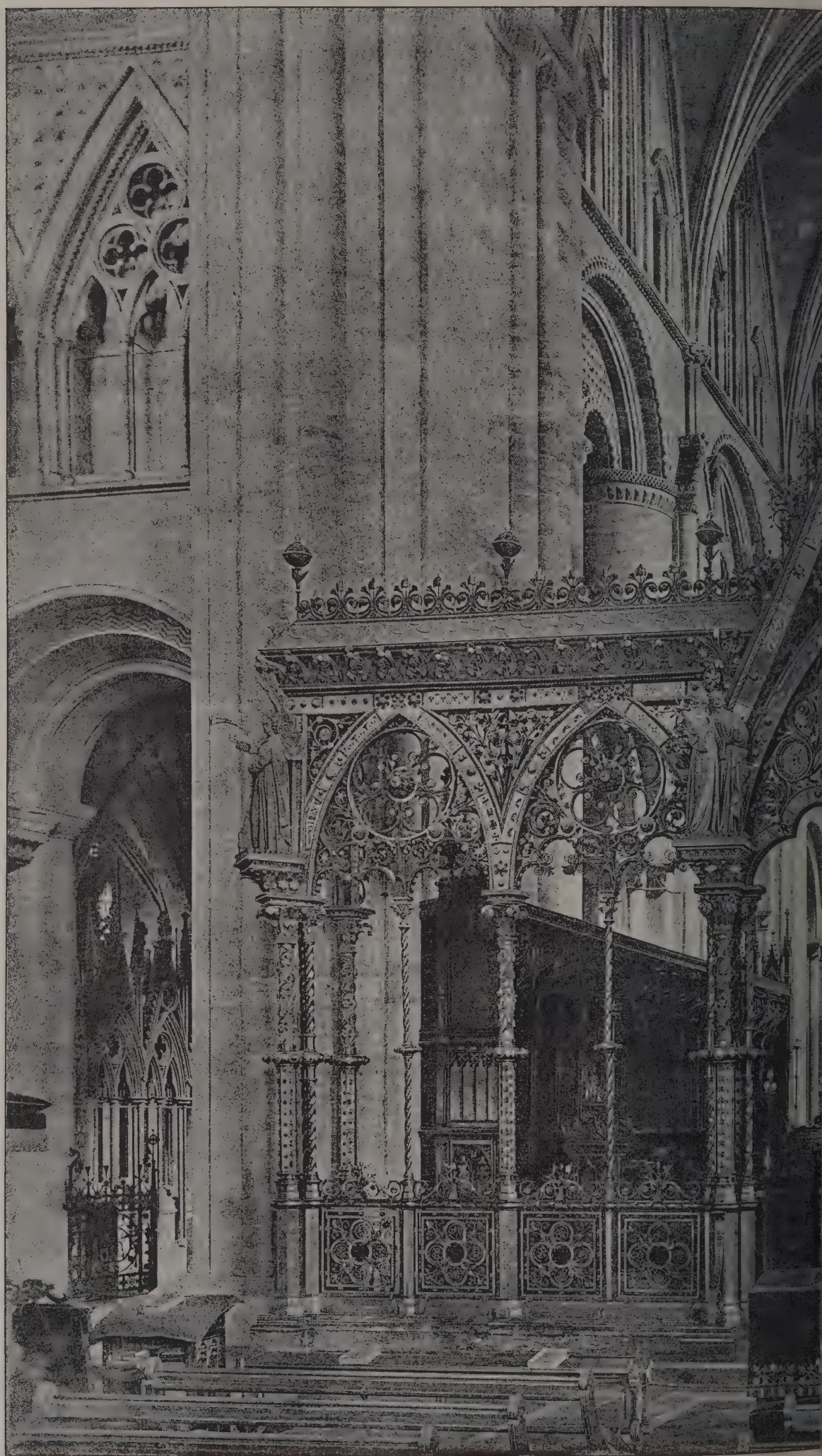






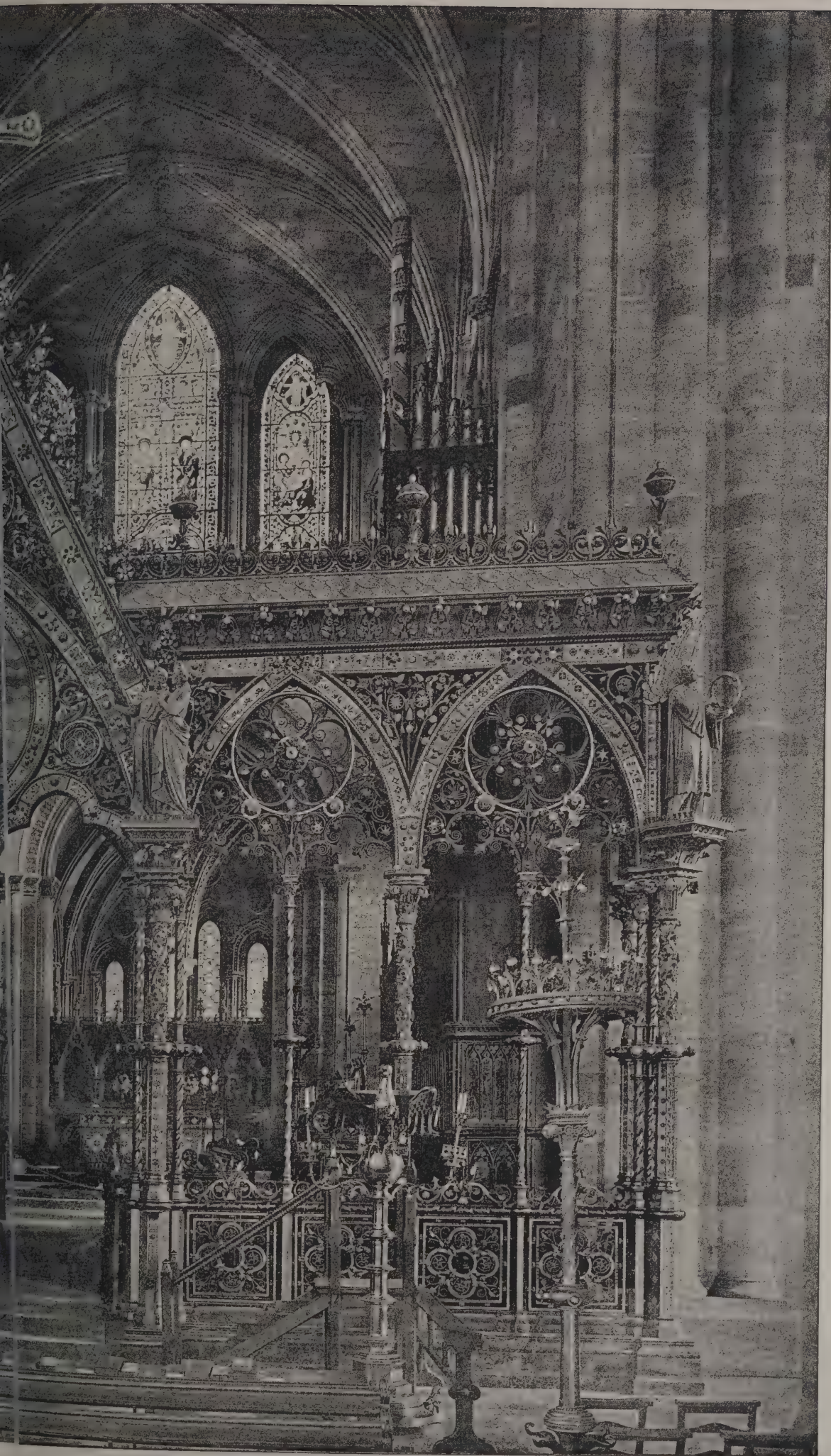
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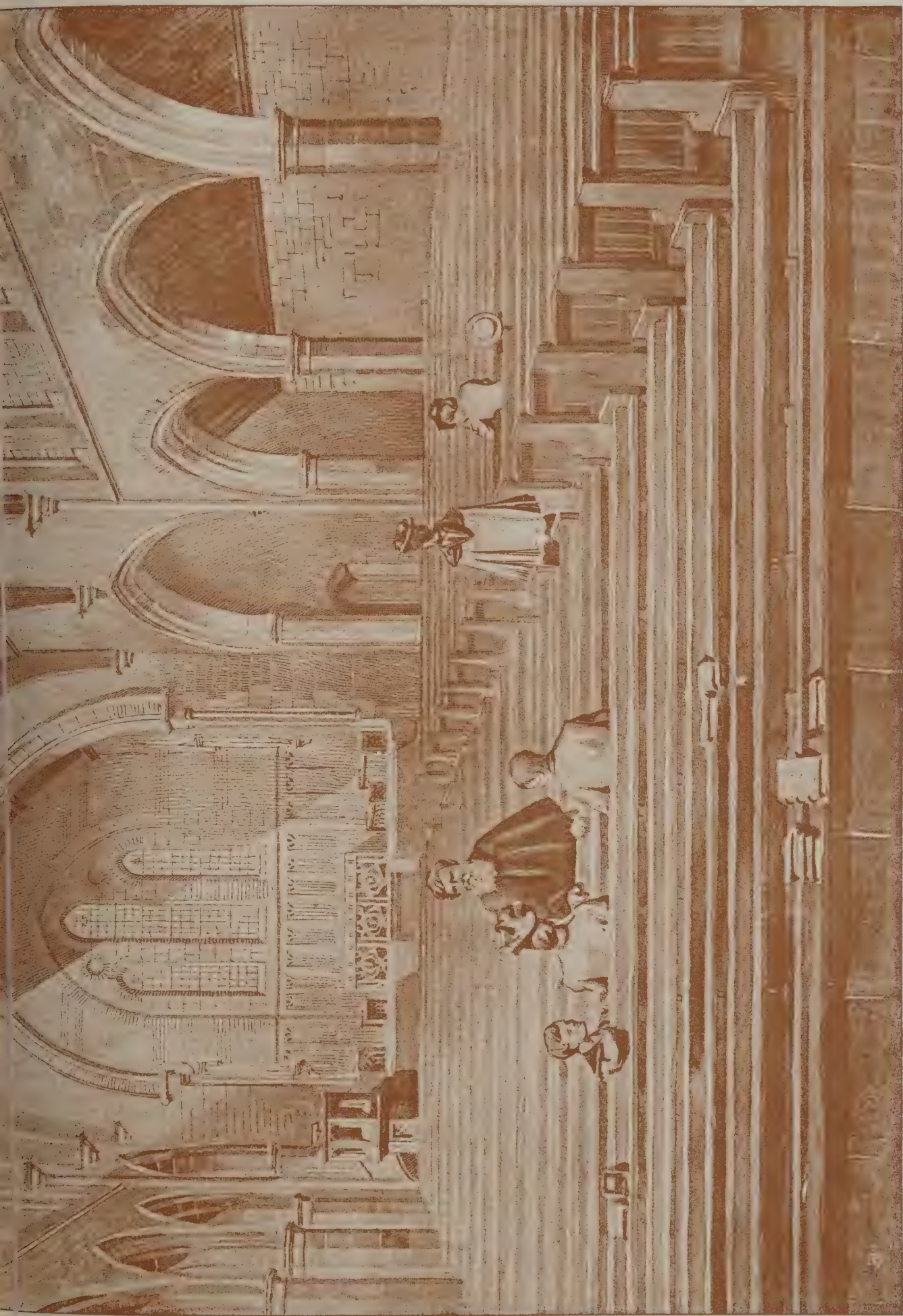












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INTERIOR: ST. DAVID'S CHURCH, BATHGATE.

J. GRAHAM FAIRLEY, F.R.I.B.A., Architect







THE

## Architect and Contract Reporter.

## EDITORIAL NOTICES.

*In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

## TENDERS, ETC.

*\*\* As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

## COMPETITIONS OPEN.

CAPE TOWN.—Jan. 31.—The Council of the University of the Cape of Good Hope invite designs for the erection of university buildings. Premiums of 400*l.*, 200*l.* and 100*l.* will be awarded to the authors of the designs placed first, second and third respectively. Particulars of the competition may be obtained on application to the Registrar at Cape Town, or to the Agent-General in London.

DURBAN (NATAL).—Dec. 18.—Designs are invited for new town hall, library, museum, art gallery and municipal offices. Three premiums of 500*l.*, 300*l.* and 200*l.* respectively will be awarded for the three best designs in order of merit. Mr. W. H. Radford, C.E., Albion Chambers, Nottingham.

GREENWICH.—Designs are invited for a public library (with chambers for chief librarian's residence) to be erected at a cost of about 6,500*l.*, with fittings, on a site about 7,000 feet super, in the borough of Greenwich. Premiums of 50*l.* and 30*l.* are offered. Particulars can be obtained on application to the Greenwich Borough Council.

INDIA.—Nov. 1.—Competitive designs are invited for the erection of a memorial to Her Majesty the late Queen Victoria at Allahabad. A premium of 2,000 rupees will be awarded to

the design selected by the committee. Mr. H. Nelson Wrigh Indian Civil Service, honorary secretary, Queen Victor Memorial Fund Committee, Allahabad, India.

NEWARK.—Oct. 14.—Designs and suggestions are invite for alterations and additions at the infirmary, Bowbridge Road, Newark, comprising a board and committee-room, a new mortuary and provision for twenty extra beds. A prize of twenty guineas is offered for the best plans sent to the office of Mr. M. H. Colton, clerk, 27 Lombard Street, Newark.

STROOD.—Oct. 15.—Plans are invited for further hospital accommodation on a site recently acquired by the Strood Rural District Council in Whitehill Road, Cobham. A premium of 15*l.* 15*s.* is offered for the best set of plans submitted.

## CONTRACTS OPEN.

ACCRINGTON.—Oct. 21.—For new works, Spring Hill, for Lang Bridge, Ltd: (contract No. 2) erection and completion of the superstructures; (3) supply and fixing of constructional iron and steelwork. Mr. Henry Ross, architect, 15 Cannon Street, Accrington.

ACTON.—Oct. 21.—For erection of a house for the engineer at the Acton sewer works. Mr. D. J. Ebbetts, surveyor, 242 High Street, Acton, W.

BARROW-IN-FURNESS.—For erection of new shop in Duke Street, Hindpool, and seven houses in Hartington Street, Barrow-in-Furness. Mr. J. Y. McIntosh, architect, Cornwallis Street, Barrow-in-Furness.

BEVERLEY.—Oct. 22.—For erection of a house for the clerk and steward of the East Riding asylum. Mr. C. W. Hobson, clerk to the asylum, Newbegin, Beverley.

BLACKPOOL.—Oct. 15.—For the supply and erection of coal elevator, bunker and automatic weigher in connection with the electricity works, West Caroline Street, Blackpool. Mr. Charles Furness, borough electrical engineer.

BOOTLE.—Oct. 18.—For the wiring of the new fire station in Strand Road, Bootle, Lancs. Messrs. Anderson & Crawford, architects, 36 Dale Street, Liverpool.

BRADFORD.—Oct. 13.—For demolishing steam-boiler chimney. Mr. F. Holland, architect, 11 Parkinson's Chambers, Hustlergate, Bradford.

BRIDLINGTON.—Oct. 20.—For construction of underground lavatories in South Cliff Road. Mr. A. E. Mathewman, town clerk, Town Hall, Bridlington.

BRIERLEY HILL.—Oct. 21.—For erection of a technical school and free library at Brierley Hill, Staffs. Mr. William Waldron, clerk, U.D.C., 17 High Street, Brierley Hill.

BROMSGROVE.—Nov. 15.—For erection of the first portion of the proposed new lunatic asylum on the Barnsley Hall estate, near Bromsgrove, Worcestershire. Mr. George T. Hine, architect, 35 Parliament Street, Westminster.

BURTON-UPON-TRENT.—Oct. 22.—For erection of a car depôt in Horninglow Street. Particulars may be obtained at the Borough Engineer's Offices, Town Hall, Burton-upon-Trent.

BURY.—Oct. 18.—For erection of stone fence walls near Clow Bridge reservoir. Mr. James Cunliffe, farm bailiff, Windy Bank, Water, Rawtenstall.

CARLTON.—Oct. 22.—For erection of isolation hospital at Carlton, Notts. Mr. Fred Hopkinson, architect, 40 Bridge Street, Worksop.

COALVILLE.—Nov. 4.—For supply and delivery of the pipes and specials required in the construction of new waterworks. Mr. J. B. Everard, 6 Millstone Lane, Leicester.

COALVILLE.—Nov. 4.—For supply and delivery of No. 192 sluice, air and reflux valves, No. 219 screw-down hydrants, No. 89 expansion joints, and No. 4 Deacon's waste-detecting

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meters, with other fittings, surface boxes, name plates and posts required in the construction of new waterworks. Mr. J. B. Everard, 6 Millstone Lane, Leicester.

COALVILLE.—Nov. 4.—For construction of a service reservoir to hold 500,000 gallons, the laying and jointing of mains, fixing fittings and testing and other work required in the construction of new waterworks. Mr. J. B. Everard, 6 Millstone Lane, Leicester.

COALVILLE.—Nov. 4.—For erection at the proposed new pumping station of two compound inverted tandem pumping engines, each capable of lifting not less than 240,000 gallons of water in twelve hours, and two steel Lancashire boilers, 6 feet 6 inches diameter, 20 feet long, including steam and water pipe connections and fittings, foundation bolts, plates and girders, overhead traveller, &c. Mr. J. B. Everard, 6 Millstone Lane, Leicester.

COBRIDGE.—Oct. 18.—For erection of additional rooms and other works at the Sandbach School and Almshouse Foundation, Globe Pottery, Cobridge, Staffs. Mt. Alfred Price, architect, Sandbach.

CONISTON.—Oct. 18.—For erection of a villa residence, Stott Park, Lake Side. Mr. Jonathan Bell, architect, Coniston.

CREWE.—Oct. 28.—For erection of a diphtheria pavilion for twelve beds and other additions to the isolation hospital. Mr. G. E. Bolshaw, architect, 189 Lord Street, Southport.

DERBY.—For erection of a model lodging-house in Walker Lane, Derby. Mr. Joseph T. Holford, architect, 34 Corn Market, Derby.

DERBY.—Oct. 15.—For erection of a smithy at the Nottingham Road depot. Mr. John Ward, borough surveyor, Babington Lane, Derby.

DOVER.—Oct. 24.—For erection of new coastguard buildings, consisting of quarters for an officer and seven men, with watchroom, &c., at East Cliff, near Dover. Particulars may be obtained at the Coastguard Station, East Cliff.

EAST INDIAN RAILWAY.—Oct. 15.—For delivery of steel rails. Mr. C. W. Young, secretary, Nicholas Lane, London.

EVERSLEY.—Oct. 13.—For erection of a steel platform with parapets to the bridge across the Eversley, and known as Eversley Bridge, Hants. Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

FELIXSTOWE.—Oct. 14.—For erection of stables and cart-sheds in Garrison Lane and street works in Brook Lane. Particulars obtained from the Surveyor, Town Hall, Felixstowe.

FULHAM.—Oct. 15.—For reconstruction of skylights, lanterns, &c., in the roof of the central library, Fulham Road. Mr. R. M. Prescott, town clerk, Town Hall, Fulham, S.W.

GREAT YARMOUTH.—Oct. 17.—For erection of two houses in York Road. Mr. Chas. G. Baker, architect, Town Hall Chambers, Great Yarmouth.

GREENWICH.—Oct. 14.—For erection of a weights and measures testing office, with stable building and a coroner's court in Lamb Lane. Particulars may be obtained at the General Section of the Architect's Department, 18 Pall Mall East, S.W.

HACKNEY.—Oct. 13.—For construction of a removable wooden floor, 120 feet long by 40 feet wide, a platform, two additional exits and other structural alterations at the men's first-class swimming bath, Public Baths, Lower Clapton Road. Mr. George Grocott, town clerk, Town Hall, Hackney.

HALIFAX.—Oct. 17.—For erection of new model bakery, &c., at Mile Cross, Halifax. Mr. Medley Hall, architect, 29 Northgate, Halifax.

HARROW.—Oct. 14.—For erection of a court-house at Harrow, Middlesex. Mr. H. T. Wakelam, county architect, Middlesex Guildhall, Westminster.

HUDDERSFIELD.—Oct. 14.—For erection of a weaving-shed at Thirstin Mills, Honley. Mr. J. Berry, architect, 3 Market Place, Huddersfield.

ILFORD.—Oct. 13.—For erection of a boys and girls' school for 880 children, with latrines, &c., on the Loxford Hall estate, and a domestic economy centre on the Cleveland Road school site, Ilford, Essex. Mr. C. J. Dawson, architect, 7 Bank Buildings, Ilford, Essex.

ISLEWORTH.—Oct. 28.—For erection of vagrant wards at the workhouse at Isleworth. Mr. W. H. Ward, architect, Paradise Street, Birmingham.

IRELAND.—Oct. 13.—For construction of a cast-iron subway under the Grand Canal Dock, near the Victoria Bridge, Dublin. Mr. Spencer Harty, city engineer, City Hall, Dublin.

IRELAND.—Oct. 13.—For erection of residence for the officer at the Glen distillery, Kilnap, co. Cork. Mr. James F. McMullen, architect, 50 South Mall, Cork.

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IRELAND.—Oct. 16.—For improvements to three houses and plastering four at Faban Street and Bogside, Londonderry. Mr. J. P. McGrath, architect, 28 Carlisle Road, Londonderry.

IRELAND.—Oct. 19.—For erection of a fire-brigade station at Ardoyne, Belfast. Messrs. Young & Mackenzie, architects, Scottish Provident Buildings, Belfast.

IRELAND.—Oct. 22.—For erection of eighty-four labourers' cottages in the South Dublin Rural District, viz fifteen cottages, under four contracts, in Clondalkin electoral division; fifteen cottages, under seven contracts, in Palmerston electoral division; thirty-seven cottages, under fourteen contracts, in Tallaght electoral division; and seventeen cottages, under nine contracts, in Whitechurch electoral division. Mr. T. J. Byrne, surveyor, 1 James's Street, Dublin.

IRELAND.—Oct. 29.—For additions and alterations to the Londonderry county and county borough infirmary. Mr. Albert E. Murray, architect, 37 Dawson Street, Dublin.

IRELAND.—Oct. 31.—For rebuilding premises 52 South Mall, Cork. Messrs. W. H. Hill & Son, architects, Cork.

KINGSTON-ON-THAMES.—Oct. 20.—For erection of a new ambulance and hearse shed, putting new wood floors and fire-places in and underpinning brick walls to the isolation wards, and erection of porter's room at infirmary, Kingston-on-Thames. Mr. Jas. Edgell, clerk, Union Offices, Coombe Lane, Kingston-on-Thames.

LANGTOFT.—Oct. 13.—For erection of a school at Langtoft, East Yorkshire. Mr. Joseph Shepherdson, architect, 14 Middle Street South, Driffield.

LEEDS.—For erection of a house in Spen Lane, Hardingley. Mr. Albert E. Kirk, architect, 13 Bond Street, Leeds.

LEEDS.—Oct. 16.—For erection of a shed at Antwerp mills, Armley. Mr. C. S. Nelson, architect, Sun Buildings, 15 Park Row, Leeds.

LINCOLN.—Oct. 16.—For reseating and additions and alterations to Wesley Chapel, Clasketgate, Lincoln. Messrs. W. Mortimer & Son, architects, Lincoln.

LONGWOOD.—Oct. 15.—For construction of a reservoir at the Prospect Mills, Longwood, Yorks, having a capacity of about 3,750,000 gallons. Messrs. C. F. Mallinson & Son, surveyors, &c., Market Place, Huddersfield.

LOUGHBOROUGH.—Oct. 21.—For erection of a Board school to accommodate 300 children in Rendell Street, Lough-

borough, Leics. Messrs. Barrowcliff & Allcock, architects, Mill Street, Loughborough.

MACCLESFIELD.—Oct. 14.—For taking-down and re-erection of stone wall adjoining the school of art and the formation of a new tennis-court at the girls' high school. Mr. Edward E. Adshead, borough engineer, Macclesfield.

MANCHESTER.—Oct. 13.—For erection of additional dressing-boxes in the females' swimming-bath at Osborne Street and Leaf Street baths. Particulars upon application at the General Superintendent's Office, Osborne Street Baths, Manchester.

MANCHESTER.—Oct. 16.—For steelwork in the construction of coal bunkers at the Stuart Street generating station. Particulars on application at the City Surveyor's office, Town Hall.

MANCHESTER.—Oct. 18.—For supply of the following, viz.:—(a) Three steel boilers for heating purposes. (b) Cast-iron pipes, &c. Mr. J. M. McElroy, general manager, Tramways Department, Manchester.

MORPETH.—Oct. 13.—For pulling-down and clearing away buildings at the corner of Market Place and Oldgate, Morpeth, Northumberland, and erection of new Y.M.C.A. premises, shops and dwellings. Mr. J. Walton Taylor, architect, St. John Street, Newcastle.

NORTH FEATHERSTONE.—Oct. 14.—For erection of a Primitive Methodist church at North Featherstone, Yorks. Mr. W. G. Smithson, architect, 13 Bond Street, Leeds.

PURLEY.—For erection of a house at Purley, Surrey. Mr. F. Owen Moore, architect, 12 Cornford Grove, Balham, S.W.

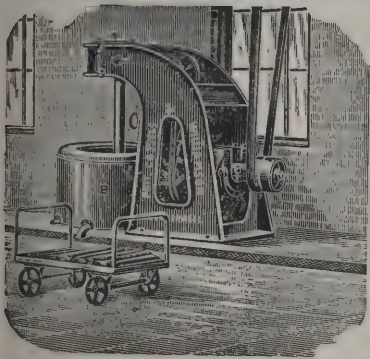
ROTHERHAM.—Oct. 16.—For supply of steam pipes and valves, feed pipes and valves, feed-pump and economiser, exhaust, water and drain pipes and valves, and the extension of the switchboard. Mr. H. Hampton Copnall, town clerk, Town Hall, Rotherham.

SALE.—For erection of an electricity supply station. Mr. Charles Hopkinson, 29 Princess Street, Manchester.

SCOTLAND.—Oct. 13.—For supplying, ready for erection, certain bucket elevators and accessories for catch-pits, also for the supply and erection of single line railway gantry, about 193 feet long, over precipitating tanks, at the Eastern District sewage works, Swanston Street, Glasgow. Mr. David Home Morton, 130 Bath Street, Glasgow.

SCOTLAND.—Oct. 16.—For erection of a custom-house at Longhope, Orkney. Particulars on application to the Secretary, H.M. Office of Works, &c., Storey's Gate, S.W.

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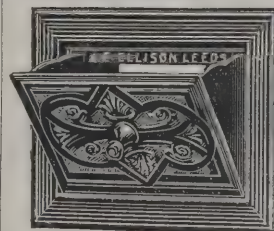
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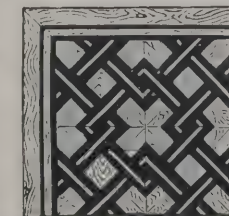
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SCOTLAND.—Oct. 20.—For construction of Lothian Road goods yard, Barrel Bank Covering, Edinburgh. Caledonian Railway Company's Divisional Engineer, Princes Street Station, Edinburgh.

SCOTLAND.—Oct. 28.—For construction, supply and erection under one contract of the machinery and accessories required for the mechanical equipment of the machinery buildings at the Dalmaur outfall works, Glasgow. Mr. David Howe Moreton, 130 Bath Street.

SHEFFIELD.—Oct. 13.—For erection of an additional carshed at Queen's Road, Sheffield. Mr. Charles F. Wike, C.E., city surveyor, Town Hall, Sheffield.

SHEFFIELD.—Oct. 13.—For alterations and improvements to the Conservatory Buildings, and the erection of new sanitary blocks at the Botanical Gardens. Messrs. Gibbs & Flockton, architects, 15 St. James Row.

SHEFFIELD.—Oct. 13.—For erection of a retaining wall to the roadway adjoining Haywood's Quarry, Deepcar. Messrs. Fowler & Marshall, surveyors, Hartshead, Sheffield.

SKIPTON.—Oct. 13.—For erection of sanatorium for consumptives at Eastby, near Skipton. Mr. Fred Holland, architect, 11 Parkinson's Chambers, Hustlergate, Bradford.

SOWERBY BRIDGE.—For erection of an engine-house, with large concrete bed, at Sowerby Bridge, Yorks. Mr. Arthur George Dalzell, architect, 15 Commercial Street, Halifax.

STAMFORD.—Oct. 27.—For erection of an infants' room at Greatford school, and removing and rebuilding the existing outer offices. Specifications and plans to be seen at the school or sent on application.

STOWMARKET.—For erection of the Stowmarket Co-operative Society's business premises in Bury Street. Mr. Philip J. Turner, architect, Stowmarket.

STRATFORD-ON-AVON.—Oct. 15.—For erection of schools to accommodate 150 children in the village of Pebworth. Messrs. Harvey Bros, architects, 30 King's Road, Evesham. Mr. H. B. Phillips, clerk to School Board, Honeybourne, Evesham.

STROUD.—Oct. 17.—For erection of an isolation hospital, with works incidental thereto, at Cashes Green, Cainscross, near Stroud, Gloucestershire. Mr. G. P. Milnes, architect, &c, Stroud.

SUMMERSEAT.—Oct. 27.—For reconstruction of the existing tanks, sludge filters, &c. Mr. James Diggle, Hind Hill Street, Heywood.

TEWKESBURY.—Oct. 13.—For erection of a mortuary at the back of Avon. Mr. H. L. Badham, town clerk, Town Hall, Tewkesbury.

TUNBRIDGE WELLS.—Oct. 18.—For construction of main flues at the central electric-light station. Any information may be obtained on application to the Borough Surveyor, Town Hall, Tunbridge Wells.

UPPER HOLLOWAY.—Oct. 16.—For builders' work at the Islington Infirmary, Highgate Hill. Mr. William Smith, architect, 65 Chancery Lane, W.C.

WAKEFIELD.—Oct. 18.—For electric-lighting installation at the old workhouse buildings. Mr. H. Beaumont, clerk to Guardians, Union Offices, Tetley House, Wakefield.

WALES.—Oct. 13.—For erection of public conveniences at Beresford Road and Fair Oak Road, Roath, Cardiff. Mr. J. L. Wheatley, town clerk, Cardiff.

WALES.—Oct. 13.—For erection of a new school (senior mixed department to accommodate 400) at Treorky, with master's residence, &c. Mr. Jacob Rees, architect, Hillside Cottage, Pentre.

WALES.—Oct. 13.—For erection of a new Constitutional club building at Dowlais. Messrs. James & Morgan, architects, Charles Street Chambers, Cardiff.

WALES.—Oct. 14.—For erection of four houses and two cottage flats at Cwmaman. Messrs. Llewellyn Smith & Davies, architects, Aberdare.

WALES.—Oct. 16.—For erection of a police station and cells at Llanfairfechan. Particulars may be obtained at the County Surveyor's Office, Carnarvon.

WALES.—Oct. 18.—For erection of a house on Sylen Mountain, near Five Roads, Llanelly. Mr. Wm. Bennett, Ystodwen Farm, Five Roads.

WALES.—Oct. 18.—For alterations and additions to Porthcawl police station. Mr. T. Mansel Franken, clerk, County Council Offices, Westgate Street, Cardiff.

WALES.—Oct. 21.—For erection of twenty-eight houses at Newbridge, Mon. Mr. George Stevens, surveyor, Council's Office, Abercarn.

WALES.—Oct. 21.—For repairs to the joint county bridge at Loughor, Carmarthenshire. Mr. J. W. Nicholas, clerk, County Offices, Carmarthen.

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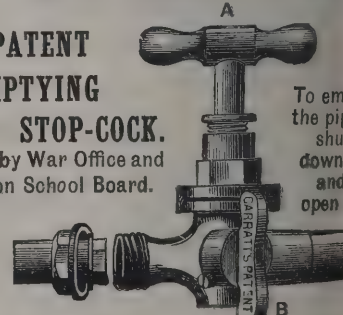
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WALES.—Oct. 23.—For erection of a boiler and engine house in connection with existing laundry at the Joint Counties Asylum, Carmarthen. Mr. E. W. Reed, clerk to the asylum, Carmarthen.

WALES.—Nov. 3.—For erection of classroom, cloak-rooms, boundary walls, &c., at Beaufort Hill Board school, Llangattock, Breconshire. Mr. Henry Waters, architect, Waengoch, Beaufort.

WALES.—Nov. 4.—For erection of a mixed and infants' school (to accommodate about 400) at Ystradgynlais. Mr. Philip Williams, Tyr Gorof, Ystradgynlais.

WIGAN.—Oct. 20.—For electrical equipment of a short length of new tramway and a portion of the existing tramways. Mr. Jas. Slevin, borough electrical engineer, Bradford Place, Wigan.

NEW schools were opened at Eastwood, Yorks, on the 2nd inst., in connection with the handsome Wesleyan church which they adjoin, and with which they communicate by means of a covered way. The scheme includes a capacious assembly hall 65 feet long by 50 feet, with end gallery; infants' room, 22 feet by 18 feet; church parlour, 26 feet by 18 feet; classrooms, lavatories, &c.; providing accommodation for 650 scholars. The front is in rock-faced York stone with ashlar dressings, the sides and rear being of brick. The front gable has a semi-circular inset containing a triple window, and is flanked by buttresses carried up and finished with octagonal pinnacles. Under the centre window there are six round-headed windows lighting the lobbies and classrooms. The two main entrances are placed right and left of the front, each having spacious porches and lobbies, and that on the left being connected with the covered way above referred to. Light cast-iron columns support the roof on the clerestory principle, and between these and the outer walls additional classrooms can be provided if required. The roof is partially open, the main timbers being visible and ornamented with arched work, the ceiling being of pitch pine. All the glazing is in cathedral glass in suitable tints, and the front windows are in leadwork with squares and diamonds and borders. The internal joinery is of pitch pine. Efficient ventilation is provided by air inlets and an exhaust ventilator in the roof. The heating is by a low-pressure hot-water system, distributing heat to all parts of the building. The cost of the work, exclusive of land and architect's fees, is 2,800*l.* The architect is Mr. John Wills, F.S.Sc., of Derby and London; the builder, Mr. Richard Snell, of Rotherham.

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For new front and decorations at The Harrow, Ripple Road, Barking. Mr. J. M. H. GLADWELL, architect, Kingsdown, Fillebrook Road, Leytonstone, N.E.

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#### Accepted tenders.

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J. & F. Hammerton, carpenter, joiner, plumber and glazier . . . . . 246 0 0  
M. Fleming, slater . . . . . 55 15 0  
J. Richardson, plasterer . . . . . 48 0 0  
H. J. Cheshire, painter . . . . . 18 16 6

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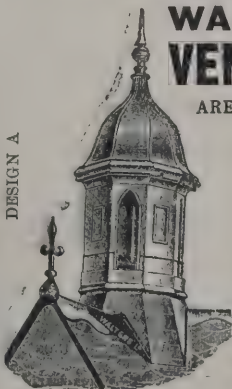
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S. Rushworth, Shipley, plumber.

J. Smithies, Great Horton Road, slater.

J. W. Sugden, Wilmer Road, plasterer.

J. C. & A. Sunderland, Great Horton, concreter.

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R. Raper, Dudley Hill, joiner.

S. E. Jackson, St. Stephen's Road, plumber.

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O. Booth & Sons, Bartle Lane, Great Horton, mason.

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Bywater Bros., Low Moor, plumber.

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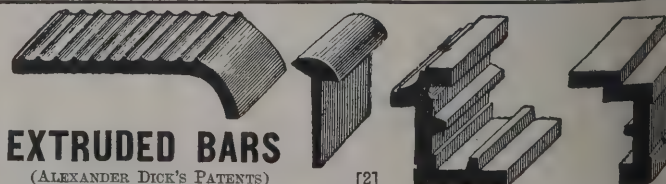
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For erection of a mortuary, coachhouse and stable, and store for disinfector at the infectious hospital, Whitehall Road, Cobham. Mr. G. E. BOND, architect, Pier Chambers, Chatham.  
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J. B. POTTER, Carshalton Road, Sutton (accepted)	11,099	0	0

## MANOR PARK.

For erection of stabling at the Rabbits Lodge. Mr. J. M. H. GLADWELL, architect, Kingsdown, Fillebrook Road, Leytonstone, N.E.

J. & H. Cocks, Ltd.	£363	0	0
H. Bishop	331	0	0
H. EVAN JONES & Co. (accepted)	249	12	0

## NORFOLK.

For alterations and additions to house at South Wootton Norfolk. Mr. HERBERT J. GREEN, architect, Norwich.

J. Cracknell	£298	0	0
R. Dye	285	0	0
Tash, Langley & Co.	279	11	0
Read & Wildbur, King's Lynn	274	0	0

\* Recommended for acceptance.

For alterations, additions, &c., at Middleton Hall, Norfolk. Mr. HERBERT J. GREEN, architect, Norwich. J. Kinnimont & Sons, 26 Chilworth Street, Gloucester Terrace, London, W. £2,390 0 0

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NORWICH.

For erection of additional classrooms and alterations at the Thorpe Hamlet girls' school and Nelson Street boys and girls' schools. Mr. C. J. BROWN, architect, Cathedral Offices, Norwich.

Nelson Street schools.

Downing & Son	£1,629	0	0
W. Wilkin, jun.	1,379	0	0
Severidge	1,368	0	0
Daws & Son	1,360	0	0
Scarles Bros.	1,340	0	0
Gill	1,330	0	0
T. C. R. King	1,300	0	0
Haydon & Daniels	1,299	0	0
Chapman & Son	1,298	0	0
Boddy & Son	1,199	0	0
Youngs & Son	1,198	0	0
Lincoln & Bush	1,150	0	0
Hannant	1,123	0	0
H. C. GREENGRASS, Pitt Street, Norwich (accepted)	1,120	0	0

Thorpe Hamlet schools.

Downing & Son	817	0	0
T. C. R. King	805	0	0
A. C. Taylor	800	0	0
T. Gill	729	0	0
Scarles Bros.	725	0	0
Chapman & Son	699	0	0
Haydon & Daniels	683	0	0
Lincoln & Bush	681	0	0
Greengrass	649	0	0
Boddy & Son	649	0	0
Youngs & Son	628	0	0
W. J. HANNANT, 118 Church Hill Road, Norwich (accepted)	607	0	0

OXTED.

For drainage to ten cottages in Station Road, Oxted, Surrey. Mr. MONEY MARSHALL, architect, 68 Great Tower Street, E.C.

G. Morgan	£132	0	0
SALES & SON (accepted)	128	0	0

PURSTON.

For repainting outside wood and ironwork at the public buildings, Wakefield Road, Purston. R. WHEATLEY, Pontefract (accepted) . . . £26 4 10

RICHMOND.

For sewage works in the borough. Mr. J. H. BRIERLEY, borough surveyor. NOWELL & Co., Warwick Road, Kensington (accepted).

For erection of a new dining-hall and laundry buildings at the workhouse, Richmond, Surrey. Mr. EDWARD J. PART-RIDGE, architect, Bank Chambers, Richmond.

J. W. Brooking	£23,957	0	0
Kellet	23,160	0	0
Martin, Wells & Co.	22,915	0	0
S. N. Soole & Son	22,813	0	0
Nightingale	22,500	0	0
W. Smith & Sons	21,625	0	0
J. M. Patrick	21,290	0	0
J. SHILLITOE & SON, Bury St. Edmunds (accepted)	21,000	0	0

SALISBURY.

For street works on the Pembroke Park Estate, Bemerton, Salisbury. Messrs. LEMON & BLIZARD, surveyors, 38 Silver Street, Salisbury. J. C. TRUEMAN, Swanley Junction (accepted) . £1,700 0 0

SOUTHGATE.

For construction of a road bridge over the New River at Whittington Road, Bowes Park, N. Mr. C. G. LAWSON, C.E., surveyor.

Spiers & Son	£2,148	0	0
Norton Bros.	1,200	0	0
NEWBY BROS., Southgate (accepted)	994	0	0

SCOTLAND.

For additions and alterations to Central Auction Mart, Turriff. Messrs. JAMES DUNCAN & SON, architects, Turriff.

Accepted tenders.

A. Massie, Turriff, mason.  
G. Milne, Forgue, Huntly, carpenter.  
J. Gammack & Co, Turriff, slater.  
C. Duthie & Sons, Turriff, plumber.  
Total, £529 4s

# LIFTS

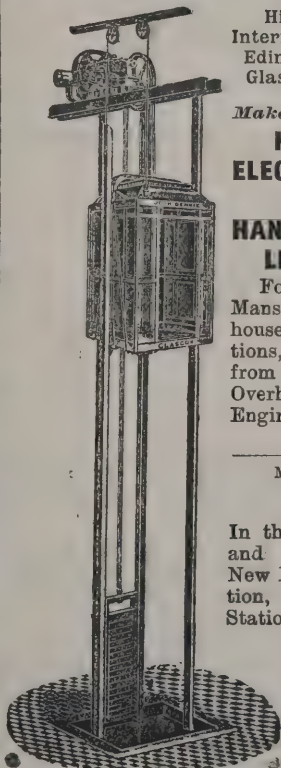
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**STANLEY.**

For sewerage works in Lee Moor and Rooks Nest Road, Stanley, Yorks. Mr. FRANK MASSIE, engineer, Tetley House, Wakefield.

Higgins & Pashley . . . . .	£401	10	0
Binks Bros. . . . .	350	0	0
A. C. Harris . . . . .	322	13	4
S. Hall . . . . .	255	10	4
T. & G. WILSON, Wakefield (accepted) . . . . .	238	11	0

**TONBRIDGE.**

For erection of a boundary wall at the Castle recreation ground.

MARTIN & Co., Tonbridge (accepted) . . . . .	£376	0	0
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**WILLESDEN.**

For additions and alterations to the Harlesden public library, Willesden Junction, N.W. Mr. JOHN CASH, architect, 28 Newman Street, Oxford Street, W.

Spiers & Sons . . . . .	£1,449	0	0
J. & W. Easterbrook . . . . .	1,327	0	0
J. Appleby . . . . .	1,274	0	0
L. F. Lamplough . . . . .	1,241	0	0
General Builders, Ltd. . . . .	1,137	0	0

*Received too late for Classification.*

**BROMLEY.**

For erection of business premises, High Street, Bromley, Kent. Messrs. WADMORE, WADMORE & MALLET, architects, 8 Bream's Buildings, Chancery Lane, E.C. Quantities by Mr. W. J. PAMPHILON, 21 Finsbury Pavement, E.C.

Syme & Duncan . . . . .	£8,867	0	0
W. G. Larke & Sons . . . . .	8,540	0	0
D. Payne . . . . .	8,095	0	0
E. P. Bulled & Co. . . . .	7,831	0	0
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Arnaud & Sons . . . . .	7,577	0	0
T. D. Gratz . . . . .	7,489	0	0
F. P. DUTHOIT, Bromley (accepted) . . . . .	7,416	0	0
F. W. Green . . . . .	7,231	0	0

**ELECTRIC NOTES.**

THE Halifax Corporation tramways and electricity committees recommend that application be made to the Local Government Board for leave to borrow 28,000*l.* for the extension of the electricity undertaking, owing to the overloaded state of the present plant.

A CONTRACT to the value of half a million sterling has been placed with the Westinghouse Brake Company, London, by the Clyde Valley Electrical Company, Glasgow, for the equipment of their two generating stations which are to supply electrical power for industrial purposes over an area of 751 square miles. The stations will be ready in about eighteen months time.

THE new electricity generating station erected by the Colne Corporation at a cost, including plant and street cables, of 25,000*l.*, was opened on the 26th ult. The installation will provide current for 5,260 8 c.-p. lamps, and provision is made for current for a projected light railway from Trawden to Nelson through Colne. It is not expected that the scheme will be a financial success for a few years. Councillor Hewitt, chairman of the electricity committee, performed the opening ceremony, and subsequently entertained the Corporation at dinner.

AN electrical exhibition, under the auspices of the Brighton Corporation, was opened at Brighton Aquarium on the 4th inst. One of its objects is to arouse interest in electricity by affording practical illustration of the many ways in which it has been brought by modern science to minister to the comfort and convenience of mankind. A striking transformation has been effected in the building; the corridors of which are filled with stalls at which are illustrated all the latest uses to which electricity can be put, while the whole place is ablaze with electric lights, giving the Aquarium the appearance of an Aladdin's cave. Among the principal novelties are an electric piano and a model electric tramway in full working order. All the most up-to-date electrical appliances are seen in actual operation, and the cooking is also done by electricity.

THE offices in connection with the municipal electric-lighting works and dust destructor at Hackney have been formally opened. The whole of the works are erected on five acres of land on the corner of the Millfields, with a frontage on Millfields Road, Clapton Park. The cost has been 44,741*l.*, this including 6,000*l.* for the offices now opened. There is yet to be added a mechanical coal-feeding apparatus.

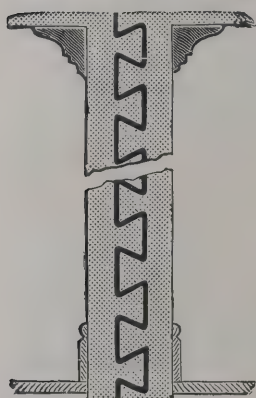
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which will hoist the coal from barges on the river Lea by electrical power and deliver it in the boiler-house. The total cost of the electric-lighting plant and apparatus, dust destructor and offices is 384,867. Although the electric-lighting works were only opened on October 31 of last year, already 118 miles of mains have been put down, while there are 670 consumers and some 700 applications for the power.

### TRADE NOTES.

MESSRS. JOHN OAKEY & SONS, LTD., will pay the dividend on Six per Cent. Preference shares for the six months ending October 31 on November 1.

MESSRS. ANDREW HANDYSIDE & CO., LTD, steel bridge, roof and structure makers, of Derby, have secured the contract for the extension of Messrs. Leys's Malleable Casting Works, Derby.

THE committee of the Sanitary Institute at the Health Exhibition (recently held in Manchester) have awarded to Messrs. Ewart & Son, Ltd., of 346-350 Euston Road, a medal for the combined efficiency and safety of their well-known "lightning" geyser.

OWING to their extensive premises in Drury Lane having been acquired by the London County Council for the purposes of the new street, Messrs. Hart, Son & Peard have removed to 138-140 Charing Cross Road, Oxford Street, where they are now fully prepared to receive their customers.

WE have received a price list of the various useful appliances of which Messrs. Heathman & Co., of Rectory Road, Parson's Green, S.W., and branches, are the manufacturers. These comprise fire-extinguishing apparatus, ladders, steps, barrows, window-cleaning appliances, &c., of which the dimensions and very moderate prices are fully given.

THE Rev. Jas. Harrison, M.A., vicar, churchwardens and inhabitants of Barbon, have given instructions to Messrs. W. Potts & Sons, clock manufacturers, Guildford Street, Leeds, to fix a new 8-day hour-striking clock in the tower of Barbon parish church from the plans of Lord Grimthorpe. The dial is from the designs of the architects, Messrs. Paley & Austen, Lancaster.

FOR the convenience of their customers in the north of London, Messrs. J. H. Sankey & Son, contractors to

H.M. Government, have opened a dépôt at the Midland Railway Goods Yard, Kentish Town (Gillies Street entrance), where they are stocking best Portland cement, grey lime, plaster, pipes, slates, sands, glazed bricks, blue bricks, fire bricks, sanitary specialties, &c., and all other goods in their line for which there is a demand. It is worthy of notice that from their various wharves and dépôts they are in a position to deliver anywhere in the metropolitan area by van. They point out that they can also deliver direct from the various works with which they are connected.

MESSRS. M. GLOVER & CO., saw-mill engineers of Leeds, had a very interesting exhibit at the recent great Yorkshire Agricultural Show, which received the constant attention of visitors. Representative appliances were exhibited illustrating their patent machinery for sawing, arranging, splitting, screening and bundling firewood, which are admittedly valuable in connection with the firewood industry, and the saving of labour, &c., should represent a high rate of profit for users. A portion of the exhibit consisted of a glass case containing valuable working models to scale. There were also exhibited some of Messrs. Glover's high-class saw-benches and several of their new patent "ideal" saw-guards. One of their well-known improved saw-sharpening machines and a machine for compressing and bundling up box and case boards was likewise shown. Users may be advised to ask the patentees for lists, &c., their address being M. Glover & Co, engineers, Holbeck Lane, Leeds.

A VERY satisfactory demonstration of the value of the May-Oatway fire alarm apparatus was given on Saturday afternoon last at Messrs. Hunter, Barr & Co.'s new premises in Queen Street, Glasgow. This efficient system, with which many of our readers are by this time familiar, and which consists of the expansion of an exposed wire or wires in the building by a sudden rise in temperature, which causes the action of a metallic connection to complete an electric circuit and ring a gong both in the building and at the Central Fire Station, was minutely examined by a large company and lucidly explained by Mr. G. H. Oatway, and at 3.17, in the presence of Bailie Cleland, the convener of the Fire Brigade committee; Firemaster Paterson, Central; and Firemaster Inkster, Aberdeen, and others, a quantity of wool waste, soaked in spirits of wine, was lit on the ground floor of the building. Twenty seconds from the moment of lighting the gong was ringing loudly, and the alarm thus efficiently given.

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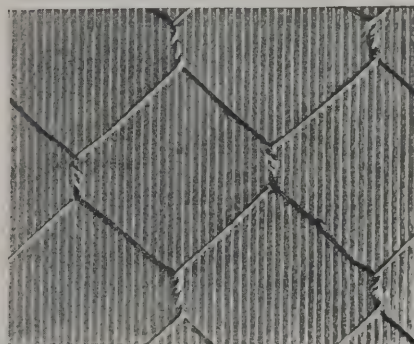
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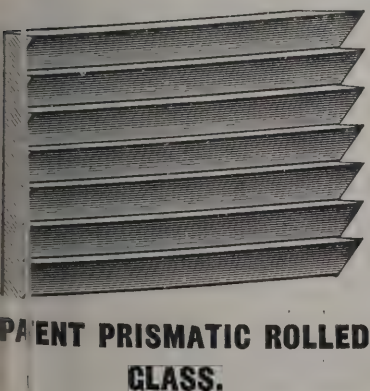
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## VARIETIES.

THE Bishop of Stepney, on the 4th inst., consecrated St. Faith's Church, Shandy Street. The chancel, with two bay naves, was opened for divine service in November, 1891. The completed building has cost 5,000*l*.

ST. MARY'S, Eastry, near Dover, has been reopened after undergoing extensive restoration. This church was erected in 1285, and was the third built on the same site. A thousand years ago Eastry was the capital of the kings of Kent, and Thomas à Becket lay in hiding at Eastry Court on his celebrated journey to France in 1164.

THE opening of the Barry Road, Northampton, Board school took place on Friday afternoon. The school, which gives accommodation for 1,370 children—420 boys, 420 girls and 530 infants—has, with the swimming bath and the caretaker's house, cost 24,396*l*. The rooms are lofty and well-lighted, while the arrangements for heating and ventilation are of the best. The architects were Messrs. Law & Harris.

A NEW Primitive Methodist church in Lady Pit Lane, Leeds, was opened on Saturday. Formerly the congregation worshipped in a small iron structure on the same site. Now they have got a commodious building, with a school, that has cost some 3,657*l*. The chapel contains seating accommodation for 650, and the school, which is underneath, will accommodate from 400 to 500. The building is of brick and in a modified Classic style, well adapted to the situation by the architect, Mr. W. G. Smithson, of Leeds.

THE new parish hall in connection with St. Mary's Church, Liscard, was formally opened on the 25th ult. in the presence of a large gathering of parishioners. The spacious hall, which has been erected and furnished at a cost of 2,300*l*., stands at the east end of the church, facing the old Manor Lane. It consists of an assembly-room and gallery which together allow

accommodation for 550 persons. There are two large classrooms at the west end, each giving teaching accommodation for forty-two children. These rooms are arranged in connection with the platform and serve as retiring-rooms. There is also a kitchen which can be used as a classroom. There are two principal entrances at the west end, and two minor entrances which would serve as ample exits in case of need. The ground floors are laid with blocks and tiles. The large room is fitted with heating apparatus, and the whole building is lighted by electricity. The roof timbers of the hall are specially designed so that the room may be used as a gymnasium. The architect for the building was Mr. E. Nobbs, and the building contract was carried out by Mr. T. F. Cooke.

THE formal opening of the Ellerbeck infectious hospital at Workington, built by the Workington Corporation, took place on the 25th ult. The hospital, which was at one time a poorhouse, was acquired by the old Local Board in 1888 for a sum of 800*l*., and a further sum of 300*l*. was spent by the Board to make it fit for the purposes of an infectious hospital. After some years the accommodation was found to be inadequate, and the Corporation in 1897 borrowed a sum of 5,505*l*. from the Local Government Board to convert the building into a thoroughly up-to-date hospital. The old building was gutted, only the walls and roof being left, and the hospital is a two-storeyed structure. The ground-floor consists of two large wards, one of which is 33 feet by 34½ feet, and has six beds, while the other is 27 feet by 34½ feet, and has provision for four beds. On the upper floor there are two similar wards, one with six beds and the other with four, making the total number of beds twenty. On each floor there is a nurses' room, and there is a hand-lift for the purpose of removing patients to the upper floor. The building is ventilated on the most modern system, and is heated by hot water. The outbuildings comprise washhouse, drying-room, ironing-room, laundry-room, mortuary and a disinfecting-chamber fitted up with a steam disinfecter. The administration block is a separate building, and every convenience has there been furnished. A bacteria bed plant has been laid down for the disposal of the sewage on plans prepared by Mr. Jos. Graham, C.E., of Carlisle. It consists of a grit-chamber, a septic-tank and three filters or contact-beds. The plans of the building were prepared by Mr. W. L. Eaglesfield, the surveyor, and Mr. H. B. Williams, the assistant surveyor, under whose superintendence the work has been carried out.

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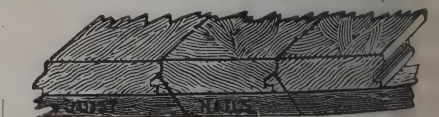
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**SAFE DEPOSITS.**

NOT the least interesting of the sights of town are the premises of the Chancery Lane Safe Deposit Company, which consist



of two vast subterranean storeys underneath the block of lofty stone buildings near the Holborn end of that gloomy region of law. In the very entrance there is something Miltonic in the look of the stalwart janitors,

Whose charge it is to keep  
This place inviolable;

and in wandering through the acre of space which the floors comprise we are impressed by the long rows of steel strong-rooms and steel safes. Here are stored away in safety countless documents of the greatest importance, and jewellery, precious stones, money, shares and other valuables, the worth of which must amount to a large sum. Chests, trunks and other secured packages may be deposited in common strong-holds under the control of the company for a few shillings a year. For safes the rent varies between one guinea and eight; for strong-rooms between five guineas and a hundred. The tenants have the only keys to them, the company having no duplicates, and they have access to them at all hours of the day. The building is entirely of iron and concrete, and it is patrolled by trustworthy men by day and night; it is therefore quite proof against thieves or fire. Pleasant and comfortable reading and writing-rooms, with a telephone, are provided for the accommodation of the tenants, and ladies have rooms reserved for them. The company have certainly satisfied a great want, as is proved by the constant increase in the number of their tenants.

**BUILDING AND BUILDERS.**

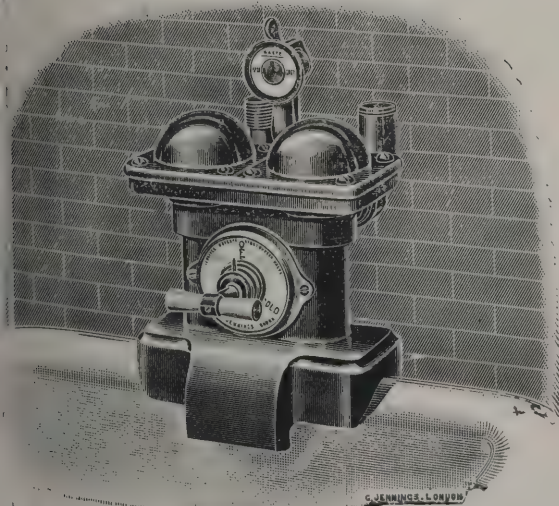
A NEW Independent Methodist chapel is to be erected at High Park Road, Southport, at a cost of 1,500*l*, and a site has been secured for 270*l*.

AT a meeting of the local Society for the Prevention of Consumption at Newcastle it was decided to build a sanatorium for consumptive patients in Northumberland and Newcastle. The proposed building is to accommodate 50 patients, and will cost 50,000*l*.

ANOTHER large theatre is about to be erected at the corner of St Martin's Lane and Chandos Street, and is to be called the Coliseum. The site consists of considerable freehold property, including three public-houses—the Chandos being the largest. A continuous entertainment is to be provided, starting at midday and lasting until midnight. Mr. Frank Matcham will be the architect.

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THE Midland and Great Northern Railways joint committee have in contemplation a scheme which practically involves the rebuilding of the Beach station, Yarmouth. The plans will be carried out by degrees. The first step will be the construction of new platforms and offices, and a subway under Kitchener Road for foot traffic. The contract for the work has been given to Messrs Chapman & Sons, of Rupert Street, Norwich.

MEMORIAL-STONES have been laid of a new Wesleyan chapel and Sunday-school at Kenilworth. The chapel, which will be a handsome building in Late Gothic style, in red brick with stone dressings, will take the place of the old incommensurable structure which has long ceased to be adequate for the local needs of the Connexion. The total cost of the scheme, including land, is 2,300*l*.

CHELTEMHAM wore an unwonted air of gaiety on the 1st inst, the occasion being the laying of the foundation-stone of the new town hall which is being erected on ground adjoining the winter garden. The main entrance of the new building (with carriage porch outside) is on the north-east side of Imperial Square, and leads into the entrance hall (40 feet by 20 feet). At each end of this entrance hall is an octagonal inner hall, from which access is obtained to the ladies' cloak-rooms, &c., on the north-west side; this latter also contains a large staircase leading to the galleries above. From each of these inner halls a corridor 12 feet wide runs the whole length on either side of the main hall, and these corridors give access at several points to the main hall and to various other rooms which will be used in connection therewith. Thus opening out of the corridor on the south-east side of main hall are the drawing-rooms (57 feet by 27 feet and 26 feet by 16 feet 6 inches), card-room (26 feet by 16 feet 6 inches), and smoking-room (21 feet by 16 feet), and on the north-west side the supper-room (55 feet 6 inches by 55 feet 6 inches), refreshment-room (37 feet by 37 feet), with service-room (37 feet by 18 feet) adjoining, and kitchen, &c., beneath. The north-west corridor connects the new town hall with the winter garden. The main hall, which will be used for balls, concerts, &c., is 112 feet long, 52 feet wide and 43 feet high, with coved ceiling. Galleries are placed at one end over the entrance hall and along each side over the corridors, and open into the hall by a series of arched openings, these being reached by staircases at the opposite end of the building. At the other end of the main hall is the platform and orchestra, with organ chamber behind same, access to which is obtained by a

separate staircase. Large storage accommodation for various purposes is provided under the floor of the main hall. Great care has been bestowed upon the planning of the buildings to make the arrangements as simple and workable as possible and to provide ample approaches and exits. The structure is already far advanced, part being nearly roofed in. The design of the building was entrusted to Messrs. Waller & Son, architects, of Gloucester, and the estimated outlay is about 35,000*l*.

### INDUSTRIAL LOCOMOTIVES.

FOR the extended use of the locomotive much of the credit should be given to Messrs. Peckett & Sons, of Bristol. Recognising the fact that for passenger and goods traffic each railway company has its own special engines, they have produced types of engines which not only can supplement those on railways, but can be adopted for a multiplicity of operations, one of the most important being for contractors' haulage. An illustrated description of their works has appeared, and a glance at the plates is sufficient to suggest the system which prevails throughout the establishments. In similar works much is commonly left to chance, but at Bristol we see "shops" which are specially arranged for the operations which are performed in them, and it is apparent that the works and machinery have not assumed a holiday appearance or have been prepared for photographing. All the views seem to have been taken immediately after the men had ceased to work. The premises are very extensive, the "shops" alone covering an area of about five acres. All parts of the engines are made by the firm. The majority of the men employed were trained in the shops, and all co-operate as if they were parts of a colossal machine. As we mentioned at the time, Messrs. Peckett supplied the engines for the Chichester and Selsey Light Railway, which was the first of its kind in this country, and their engines are known for their utility in most parts of the world. There are many types of them. In one illustration we see a saddle-tank locomotive drawing trucks on the Metropolitan Railway; but the firm turn out locomotives which are adapted to such small gauges as 1 foot 9 inches; some are for a gauge of 3 feet and upwards. There is always in stock engines for the 4 feet 8½ inches gauge, but any gauge can be suited. An important quality is that the parts are standardised, and in consequence there is no delay in repairing a locomotive which



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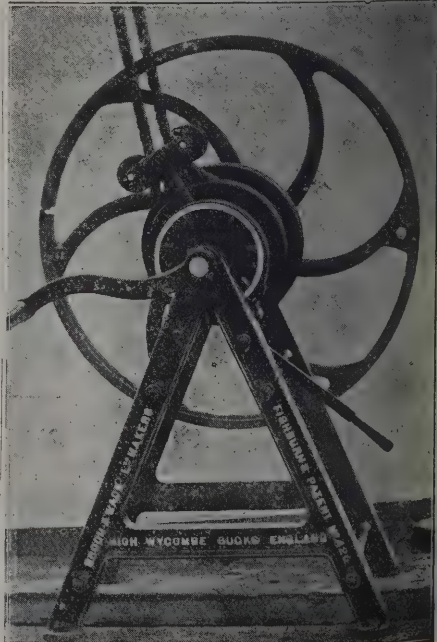
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breaks down from any cause. The Atlas Works have been in existence for about forty years. In 1880 they were taken over by the late Mr. Thomas Peckett, and ten years afterwards the business came into possession of Messrs. G. T. Peckett, J. F. Peckett, T. Peckett and L. Peckett, each of whom looks after one or more departments. The views of the works and the history of the firm are a refutation of the pessimists who imagine that English engineers are not equal to the demands of the age.

### THE DEVELOPMENT OF ROLLED BEAMS.

THERE have been so many engineering triumphs during the nineteenth century and there are so many champions to uphold the supremacy of particular examples, it is not surprising that their relative value has not been established. But as regards statical construction nothing arose during the century to surpass the determination of the forms of beams and columns. Previous to 1820, when Tredgold by means of experiments on a small scale was able to ascertain the most efficient section of a cast-iron beam, the forms which were in use would now be considered as absurd. The limitation of the resistance to extension offered by cast-iron was, however, an obstacle to its general employment for beams. The elaborate and costly experiments of Eaton Hodgkinson and Fairbairn, which were confirmed by those ordered by Robert Stephenson to discover the most suitable form for a wrought-iron beam which would serve as a substitute for cast-iron, were crowned with success. It was established beyond doubt that with two horizontal flanges united by a web a beam was produced of which the strength could be calculated beforehand, and which was not liable to the uncertainties or accidents which diminished the confidence in the use of cast-iron. The flanges might take the form of a series of cells or chambers and the web might become a framing of struts and ties, but the principle of a great structure like the Britannia Bridge was identical with that of a small girder made up of angle-irons and plates and which could be utilised for a factory floor or for a bridge over a lane. From that apparently simple conclusion structures have become possible which have not only revolutionised the practice of bridge building, but have enabled civil engineering to accomplish its main purpose of facilitating communication between men.

The simplicity of the normal wrought-iron beam was an inducement to inventors to devise arrangements for its pro-

duction by rolling. If angles, tees and channels could be turned out in unlimited quantities, why should not a form which might be described as a double tee or a quadruple angle iron with a web be also feasible? Various sections of rails could be rolled, and why not I beams or joists? A strike of carpenters in Paris had extended the use of iron, and, moreover, English architects began to realise the advantage of having floors which resembled the French, and in which rolled iron was an element. The production of joists was therefore quickened, but for a long time the sections were limited in their dimensions. An increase of size was effected with difficulty. Twenty years ago the great Cockerill Company in Belgium rolled no larger sections than 12½ inches by 6¼ inches for iron, and 8½ inches by 4 inches for steel. The biggest steel joist which has been available up to the present measures 20 inches by 7½ inches, although the Americans have a 24 inches by 7½ inches. The difficulty is as much with the width of the flanges as with the depth. As a rule the flanges were supposed to measure one-half the length, and thus such proportions as 12 inches by 6 inches, 10 inches by 5 inches, 8 inches by 4 inches, 6 inches by 3 inches, have become familiar among builders. After a certain limit the proportion is diminished—16 by 6, 14 by 6 and 17½ by 6¼ are recognised market sections.

The inefficiency arising from the inadequacy of small-size sections was overcome. Plates have been added to increase the width of joists, and two or more have been rivetted together in order to obtain the desired height. At one time it was generally accepted that for all girders which exceed 12 inches in depth it was economical to construct them of plates and angle-irons, but in a great many cases there is not sufficient time for the building-up of beams. The old leisurely methods are not adapted to our time. A man who purchases a building site and expends money on building is eager to secure returns for his outlay as soon as possible, and any course by which time can be saved is gladly utilised. One of the reasons for the adoption of steel structures in America is the expedition with which the work advances. It is possible to have several storeys of offices occupied while the remainder of the building is in the hands of the contractors.

What we have said is of course familiar to our readers, but it will help to explain the satisfaction in which every growth in size of rolled joists is received. The whole history of the world, it has been stated, would have been altered if Cleopatra's nose had been an inch longer or shorter. The possibility of

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being able to obtain a 24-inch instead of a 20-inch girder may have an important influence in fixing the character of a building. What, then, is to be said of an improvement in rolling mills by which 30-inch girders can be as easily procured as 7-inch joists were at one time? The advantages would be difficult to estimate on account of their vastness.

But increased length is only one of the improvements which architects and engineers have long desired in rolled joists. The new Differdange beams can also have no less a breadth than 12 inches, or nearly 5 inches in excess of what has been available. The old ratio no longer rules in them, for it is possible to obtain sections in which the height and width correspond. The following are some of the sections which can now be ordered:— $9\frac{1}{2}$  inches by  $9\frac{1}{2}$  inches, 10 inches by 10 inches,  $10\frac{1}{4}$  inches by  $10\frac{1}{4}$  inches,  $10\frac{3}{8}$  inches by  $10\frac{3}{8}$  inches, 11 inches by 11 inches,  $11\frac{1}{2}$  inches by  $11\frac{1}{2}$  inches, 12 inches by 12 inches. Then we can obtain a whole series of sections between  $12\frac{1}{2}$  inches and  $29\frac{1}{2}$  inches in height which have flanges with a width of 12 inches.

It is needless to point out the power of resistance which is derived from the increase in the width of the flanges. In calculating the strength of a girder we have to consider not only the area of material but the breadth and depth. In many cases the depth or height has to be reduced to a minimum, and the loss of advantages must be made up by greater width. For instance, a 16-inch by 6-inch joist is supposed to carry a safe load of 20 tons on a 20 feet span. But a 12-inch by 12-inch joist would perform the same work and allow a saving of 4 inches in the depth of a floor. Girders should be always sufficiently deep, but when space has to be measured in fractions of an inch compensation must be found in width. There are also numerous other cases where width is essential to steadiness. When steel joists are used for columns or stanchions the width of flanges aids stability to an extraordinary extent.

We have confined our remarks to qualities which must be self-evident when they are mentioned. Nothing has been said about the sections of the flanges in which a uniform taper of 9 per cent. has been adopted. In the majority of rolled joists the tapering is at least 14 per cent. Care has also been taken in forming the contour of the curves between the web and the flanges and in the curves of the flanges. In fact, the whole section shows a combination of lines which will make the Differdange beams easy of recognition. The steel generally employed is equal to a strain of from 24 to 29 tons

per square inch. But higher qualities of steel can be used by special agreement.

The Differdange beams have been introduced to the English market by Messrs. H. J. Skelton & Co., 71 Finsbury Pavement, E.C., who have prepared tables and diagrams which are convincing from their scientific accuracy. The beams themselves stand in no need of eulogy. They will meet necessities of construction which formerly required not only labour, but anxiety on the part of architects. To be able to secure a beam which on a span of 15 feet will sustain a distributed load of 102 tons with a working stress of only 5 tons a square inch is a gain which every architect can appreciate, especially when he remembers the beam can be purchased and delivered immediately, thus avoiding delays which often cause inconvenience to clients as well as to contractors.

### SOCIETY OF ENGINEERS.

At a meeting of the Society of Engineers, held at the Royal United Service Institution, Whitehall, on Monday evening October 6, Mr. Percy Griffith, president, in the chair, a paper was read on "The Hennebique System of Ferro-Concrete Construction," by Mr. Augustus de Rohan Galbraith.

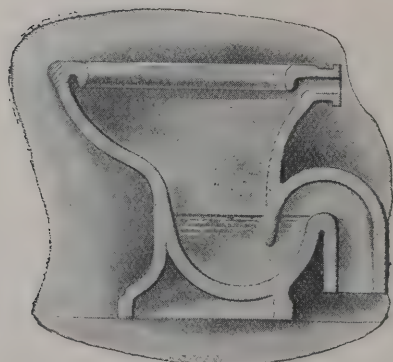
The author commenced by observing that ferro-concrete construction appeared not to be very widely known in the profession. He then sketched the early history of the system, pointing out that the first authenticated adoption of the principle was by Napoleon the Great in the erection of fortifications near Strasburg in Alsace-Lorraine towards the close of the eighteenth century, and in which works hoop-iron bonding in concrete was employed.

He then referred to the various systems of ferro-concrete construction, stating that the originator of the principle was M. Joseph Monier, a Frenchman, and that it was first applied to the manufacture of slabs and pipes in ferro-cement. He then described the ferro-concrete system invented by M. Hennebique, a French engineer, which system has been widely introduced in practice in France, including the construction of a bridge of three arches at Chatellerault, 26 feet 3 inches wide, and having a centre span of 172 feet and two side spans of 135 feet each. This system is also being adopted in this country in various engineering works, notably in connection with the Old Quay widening and new dock works of the London and South-Western Railway Company at Southampton.

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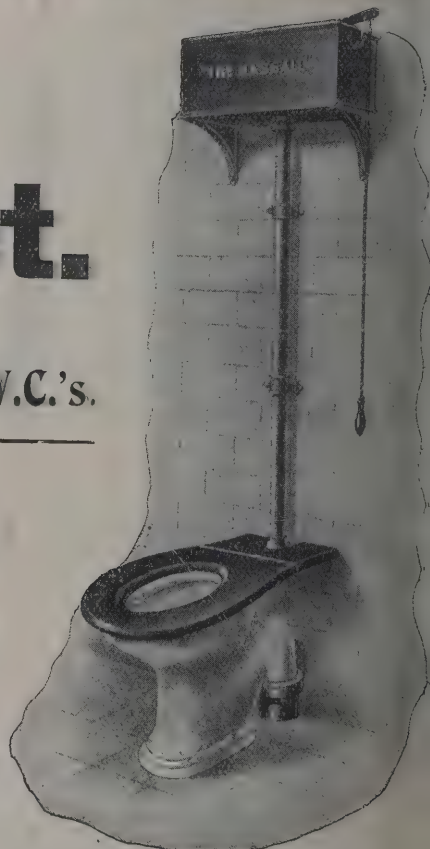
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The Hennebique principle consists in embedding in concrete straight and cranked iron or steel tension bars and stirrups, to take the shearing stresses, together with distance pieces, the system being applicable to, and employed in, entire buildings from foundation to roof, inclusive. The piles used at Southampton are built up in vertical moulds, in which are placed long steel rods, which give the required strength. These are laced together with wire stirrups, and Portland cement concrete of the best quality is filled into the moulds and rammed round the steel. After a month the pile is taken out of its mould and driven in position, much in the same way as timber piles are. The ram is exceptionally heavy, generally 30 cwt. The head of the pile is protected from injury by covering it with a helmet or iron case filled with sawdust; a timber dolly is always used.

The author then pointed out the care required in the selection and preparation of the materials, explaining that the usual proportions of the concrete were 5 to 1, and giving the preference of Siemens-Martin steel to Bessemer steel owing to the purer and more uniformly good quality of the former. He then dealt with the application of the system in general construction, giving the results of some tests of Hennebique beams with and without stirrups, which proved the superior strength of the former. He then stated that the results of experiments by Professors Baushinger and Ritter showed that the adherence of iron to concrete was about 570 lbs. per square inch. The coefficient of expansion and contraction of steel and concrete was found by M. Durand Claye to be identical up to the fifth decimal, giving the breaking strain of concrete as between 3,000 and 4,000 lbs. per square inch.

The advantages of the system as regards fire resistance were then illustrated by the light of some severe fire tests carried out at Ghent, together with the results of a fire which occurred at a spinning mill at St. Etienne, Belgium, which proved that ferro-concrete structures were perfectly fireproof.

The author then gave the following examples of the cost of the Hennebique system as carried out in different structures. The Chatellerault bridge 18*l.* 12*s.* per lineal foot; a grain warehouse at Plymouth 43*d.* per cube foot of space; a flour mill at Swansea 44*d.* per cube foot; grain silos at Swansea 64*d.* per cube foot, and some coal hoppers at Portsmouth 74*d.* per cube foot.

In conclusion the author referred to the development of the ferro-concrete system on the Continent, owing to which the French Government recently created a special department at

the Ministry of Public Works to take into consideration all matters relating to that principle of construction. He observed that although the system had not hitherto made very great headway in England, its advantages were becoming recognised and its adoption was increasing.

### METROPOLITAN IMPROVEMENTS.

In the course of the address delivered by the Chairman of the London County Council on the 7th inst., it was stated that the net cost of the four schemes which were proceeded with was estimated at 462,552*l.* Deducting from this amount the contributions to be received from the local authorities concerned, the estimated net cost to the Council became 355,348*l.*; adding to this the amount of 117,426*l.*, which during the year the Council agreed to contribute towards the cost of local improvements, the total net capital expenditure sanctioned by the Council during the year in respect of street improvements was 472,774*l.* The four improvements for which Parliamentary powers were being sought included the widening of Hampstead Road at the southern end, which would cost 225,500*l.*, of which the St. Pancras Borough Council would contribute one-eighth, and the widening of certain long lines of thoroughfare in Fulham, Deptford, Camberwell and Lambeth, in connection with proposals to construct tramways, the local authorities concerned contributing part of the cost of the street widenings. During the year one important improvement was completed, viz. the construction of Tower Bridge Road, which formed the principal southern approach to the Tower Bridge from Old Kent Road. Considerable progress had been made with the thirty-three schemes in course of execution. Of these the two most important were the new street from Holborn to the Strand and what was known as the "Westminster improvement scheme." In the case of the Holborn to the Strand improvement, where it was necessary to acquire property involving an expenditure approaching 5,000,000*l.* within a comparatively short period, Parliament had sanctioned the postponement for seven years of the beginning of the provision for the sinking fund in order to prevent an unduly heavy charge falling on the ratepayers during the seven years or so occupied in the carrying out of the improvement. After that period rents from surplus lands were expected to produce an income sufficient to pay practically the whole of the interest on the

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capital outlay. The Council also endeavoured to obtain permission to charge interest in the first few years as part of the capital cost of the improvement, but the Lords Commissioners of His Majesty's Treasury, after taking all the circumstances into consideration, came to the conclusion that they would not be justified in supporting a provision of this nature if inserted in a Bill promoted by the Council. It was anticipated that the net cost of this scheme, after obtaining recoupment by disposal of the surplus land, would ultimately not exceed 774,000*l.*, but in the meantime, during the construction of the street, interest would have to be paid on probably four or five times that amount. The total gross expenditure of the Council in respect of the county improvements already sanctioned and now in hand, or about to be undertaken, was estimated at 11,127,344*l.*, and the net expenditure, after deducting recoupment, at 5,415,444*l.*

The parks committee devoted itself unceasingly to the question of providing additional open spaces for the county, a question becoming year by year more difficult as building operations progressed and open land became less in area and more costly in price. The total area of the parks and open spaces under the control of the Council was 3,832 acres, the total cost of acquisition, including the cost of permanent works, having been about 1,475,000*l.* For the money paid the Council had obtained a most valuable asset in the form of land used for the enjoyment of the people. The committee might be congratulated on the high state of efficiency at which it had maintained the county parks and playgrounds, and upon the arrangements made to secure for the public the use and enjoyment of the places to their utmost capacity, including the provision of music, accommodation for the various games, and facilities for the study of botany, for which the Council sanctioned in May 1898 the planting of beds in Battersea, Ravenscourt and Victoria parks.

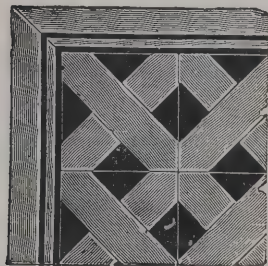
During the year undertakings were entered into which would involve a total expenditure of about 65,000*l.* in respect of land and about 600,000*l.* in respect of buildings and other works. There had been considerable difficulty in past years in providing accommodation for persons of the working classes without incurring to a slight extent a charge upon the rates. The committee now found itself in the position, after paying interest and capital charges, of having a small balance remaining to the credit of the Council. This result had been achieved by the strict economy of its staff and by the fact of having a housing manager to watch the outgoings with the greatest care.

Good progress had been made with the development of the Totterdown Fields estate, Tooting, where cottages might be expected to be ready for letting in the late autumn. A new estate at Old Oak Common Lane, Hammersmith, had also been purchased. This estate was within the county, and its 50 acres would afford accommodation for some 9,200 persons. The Council had now about 348 acres of land acquired for "housing" purposes, at a cost of 217,000*l.*, and upon this land dwellings, chiefly cottages, for about 68,000 persons had been were being, or would be built at a cost of nearly 3,000,000*l.*

### BANGOUR ASYLUM WATER SUPPLY.

A SPECIAL meeting of the Edinburgh District Lunacy Board was held on Friday last for the purpose of considering the report of Messrs. W. A. Tait and George H. Hill, the engineers, on the Bangour Asylum water supply, and to receive the recommendation of the asylums committee on the matter. Mr. Richard Clark presided, and said that as they had the presence of Mr. Hill the asylums committee thought it would be a good opportunity for him to meet the whole Board. Questions having been invited, Captain Morrison said the sooner they proceeded with the Broxburn scheme the better, for they would then be able to get on with the work. They had wasted too much time already. Mr. Nisbet said he would like to know if there was not a possibility of getting the water from an artesian well. Mr. Williamson put a similar question, and in reply Mr. Hill said that his experience for obtaining water for a district was that where water could be obtained without pumping that was the proper course to follow. Pumping carried a perpetual charge, while in the other case in the course of thirty years the waterworks became their own property. He advised them to take the drainage area in preference to an artesian well. Mr. Welsh asked if they would require to purchase a drainage area close by, and the Chairman replied that it was unnecessary. Mr. Nisbet asked what means they would have for preventing pollution if they did not acquire the right of property in the drainage area, and the Chairman replied that they had had the opinion of Mr. Hill that it was not necessary to acquire the drainage area. He intended to make a motion on the recommendation of the committee.

The Clerk then read the recommendation of the committee, which was to the effect that the Chairman had moved and



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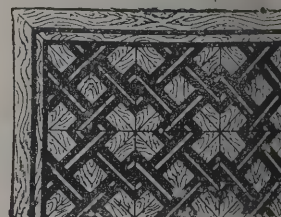
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Mr. Stalker seconded:—"That the committee, having heard Mr. Hill and Mr. Tait as to their report on the supply of water to the asylum, agree to recommend the board to adopt the scheme to supply 72,000 gallons per day from Broxburn, the initial cost of which is 16,000*l.*, and an annual cost of 900*l.*, embracing redemption and interest, and that the powers to acquire the drainage area to protect the purity of the supply being, in the opinion of the engineers, not absolutely necessary be not exercised, but that the board's powers under the Act for the purchase of a site for their works both at Linenfaulds and Broxburn, in view of possible extension, be exercised within the limit of time allowed by the Act."

The Chairman moved and Mr Stalker seconded the adoption of the recommendation. The Rev. John Baird, in supporting it, said he was very pleased at the issue of their deliberations. The committee had very carefully gone into the matter, and every possible point had been well considered. He thought they found themselves now in a very satisfactory position, and he was glad that the result of their various discussions had had the issue indicated in the motion. Mr James Thomson moved an addition to the motion, to the effect that the engineers be given power to construct cesspools or other sewage works, and have them cleaned out by the board so as to intercept pollution. The Chairman suggesting that the asylums committee would consider the matter, Mr Thomson's addition was not pressed. The Chairman said that two acres of ground had been acquired for their purpose. Mr. Welsh asked if 72,000 gallons a day would be ample for the institution, and the Chairman replied in the affirmative. The motion was unanimously agreed to, and the matter was remitted to the asylums committee to see it carried out. A vote of thanks to Mr. Hill concluded the meeting.

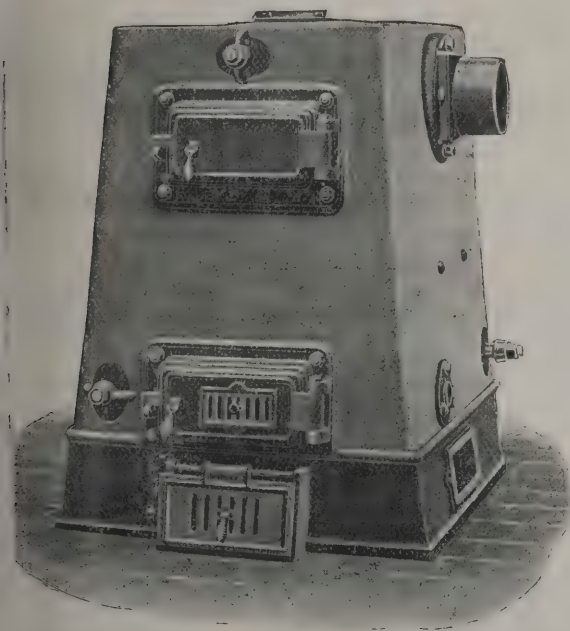
#### CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

At the Caxton Hall, Caxton Street, Westminster, on the 2nd inst., Mr. Ebenezer Howard, the author of the Garden City project, delivered an address before the members of the Civil and Mechanical Engineers' Society on "Some Engineering Features of the Garden City Scheme." Under the scheme it is proposed to lay out towns or settlements in concentric rings or belts, consisting of alternate blocks of buildings and open spaces arranged in circular formation, with an ornamental park in the centre. Discussing the engineering

aspect of such a project, Mr. Howard devoted much attention to the arrangements for water and sewage distribution. The whole city, he said, would be planned out before the engineer laid a pipe, and consequently his system of reticulation could be arranged with unexampled precision; while the sewage engineer would be, for once in his life, happy. Equally, from the electrical supply point of view, Garden City would present no difficulty. Its first use would be to supply energy and light for the construction of the town itself, because it would be necessary before the building of the town commenced to have a supply of power ready provided. If the city were to be built to-morrow steam-engines would be employed to generate the current, and the power-house would be outside the town; but a few years hence gas-engines would probably be requisitioned, with a power-house of handsome appearance in the centre of the city. Lighting in the streets would probably be by gas of poor quality with incandescent mantles, but in houses the electric light would be more popular. Traffic on the roads would be utterly different from that of an ordinary town, and the engineer would have it in his power to exercise a unique advantage by placing streets for rapid transit over or under the slow-traffic thoroughfares. The advantages to an industrial community when all the fundamentals of industry—light, heat and power "on tap" at practically wholesale charges—were provided were so obvious that the supply was sure to produce a demand, and he was sanguine that the Garden City was the city of the future.

#### SANITARY INSPECTORS' ASSOCIATION.

THE nineteenth annual general meeting of this Association was held on Saturday evening at the Holborn Restaurant. Mr. W. Wilkinson, the retiring chairman of the Council, presided during the first part of the proceedings, and moved the adoption of the report, which stated that marked progress had characterised the affairs of the Association during the past year, and it was believed that the position, status, responsibility and value of the sanitary inspector would soon receive that recognition from the public which had so long been merited. Reference was made to the appointment of a Royal Commission on Tuberculosis, and it was stated that many of the country inspectors could render incalculable service in connection with that subject. An offer had been received from the Chadwick Trustees of a gold medal and 50*l.* for presentation to that member of the Association whose



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report to his authorities for the year was considered most worthy. A sub-committee had been appointed with a view to altering certain of the conditions in order to make it practicable for every member of the Association to compete for the gift. During the year ninety-three members had been elected, and a new branch had been opened at Belfast. Mr. Alexander seconded the motion, and the report was adopted. Mr. I. Young, the new chairman of the Council, afterwards took the chair, and was invested by the outgoing chairman with the badge of office. Mr. Young, after assuring the meeting that he would do all in his power to further the interests of the Association, read a letter which the Council proposed to address to the Sanitary Institute, calling attention to the case of the Borough of Southwark v. the Metropolitan Dwellings Company, Ltd., in which Dr. Wynter Blyth was reported to have stated in his evidence for the defendants that he was chairman of the Council of the Sanitary Institute, and that the water-test was an unreasonable test to apply to old drains, with the result that the magistrate dismissed the summons. The prominent position of the witness gave weight to his opinion. The decision was, in the opinion of the Council, most prejudicial to the public health, and the expressed opinion of the witness was so strongly opposed to the experience of members of the Sanitary Inspectors' Association, and to the teachings of the Sanitary Institute, that they respectfully asked the Council of the Sanitary Institute to take steps to dissociate the Institute from implied concurrence in Dr. Wynter Blyth's opinion. He said that sanitary inspectors must safeguard their interests, and when principles were taught which they knew from practical experience to be wrong they must combat them. It was resolved to send the letter, and to forward copies to the Local Government Board and the London County Council.

#### PREPARATION OF CONCRETE.

A BRIDGE with two arches, each 50 feet in span, has been constructed of concrete on the Peoria and Eastern Railway, U.S. The concrete for the arch and spandrel walls is a mixture of one part of Portland cement, two of sand and five of stone broken to pass a 1½-inch ring, while the mixture for piers, abutments and wing walls is one part cement, three of sand and six of stone broken to pass a 2-inch ring. The following directions for preparation of the concrete were given by the engineer:—

Hand-mixed concrete shall not be made in batches of more than 1 yard in each batch. The proper amount of the several kinds of material shall be measured in some way which is entirely satisfactory to the engineer or inspector in charge of the work, so that they may be satisfied that the requisite proportions of each kind of material are delivered for each batch of concrete. Satisfactory methods of measurement will be the use of headless or bottomless barrels for measuring sand and broken stone; the use of boxes into which the sand and stone may be cast and levelled off (the boxes then being removed) or the use of square and uniform-size wheelbarrows, expressly designed for the purpose. The measurement of sand and broken stone in the ordinary shallow, round-bottom wheelbarrow will not be considered satisfactory, and shall not be permitted.

The detail of mixing concrete by hand shall be generally as follows:—The proper amount of sand shall be measured and spread upon the concrete platform, and the proper amount of cement shall be delivered and spread upon the same; the sand and cement shall be turned over dry, either by means of shovels or hoes until they are evenly mixed. They shall then be wet and mixed into a rather thin mortar, and shall then again be spread into a uniform and thin layer upon the concrete platform. The proper amount of concrete stone (the same having been previously drenched with water) shall be spread upon the mortar, and the whole shall be turned over at least twice, either by shovels or hoes before it is loaded into the wheelbarrows, or in any other way taken to be placed in the work. In wetting the mixture of sand and cement to make the mortar, and in wetting the subsequent mixture of stone and sand and cement (if necessary), a spray or sprinkler shall be used. The water must not be dashed upon the mass in buckets or large quantities, or by means of a jet. The inspector shall insist that the resultant mixture of sand, cement and stone be as nearly as possible, uniform in character, the mortar being equally distributed through the mass of stone. The inspector shall also see that the mixture is neither too wet nor too dry. It should be of such a consistency that when thoroughly rammed it will quake slightly, but it should not be thin enough to quake in the barrow or before ramming.

Machine mixed concrete shall be made of the same general consistency as the hand mixed concrete above specified. Proper precautions shall be taken to see that the requisite proportions of the different ingredients are used. If machines are used which are not provided with devices to deliver each

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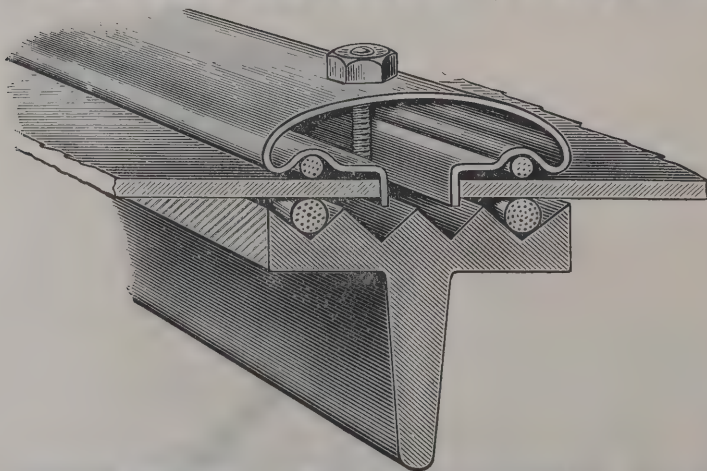
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tem, the process of making the concrete shall generally be as follows:—The proper amount of sand, cement and stone for a batch not to exceed 1 yard of concrete shall be delivered on the platform and roughly mixed together so that when the dry mass is cut down and delivered to the mixer by means of shovels, proper amounts of each of the ingredients are handled each shovelful. It will not be regarded as a satisfactory process to deliver crushed stone, sand and cement at random to the mixer, without taking some special means as above described to insure the delivery of the proper quantity of each ingredient as nearly as may be simultaneously.

Concrete facing shall be composed of 1 part Portland cement and 2½ parts sand, and shall have a thickness of at least 1 inch on all arch soffits, arch faces, abutments, piers, spandrels or other exposed surfaces. There must be no definite planes or surface of demarkation between the facing and concrete backing. The facing and backing must be deposited in the same layer, and be well rammed in place at the same time. No plastering will be allowed on the exposed faces of the work, but the inside faces of spandrel walls covered by the fill may be plastered with mortar having the same composition as specified for facing.

The concrete for arches shall be started simultaneously from both ends of the arch, and be built in longitudinal sections deep enough to constitute a day's work. The concrete shall be deposited in layers not more than 6 inches thick, each layer being well rammed in place before the previously deposited layer has had time to set partially. The work shall proceed day and night, if necessary, to complete each longitudinal section. These sections, while being built, shall be held in place by substantial timber forms, normal to the centreing and parallel to each other, and these forms shall be removed when the section has set sufficiently to admit of it. The sections shall be connected as specified above, and also, if in the opinion of the engineer it is deemed necessary, steel clamps or tie-rods shall be built into the concrete.

MINISTERIAL BUILDING IN AUSTRALIA.

ALTHOUGH the Minister for Works of New South Wales has from time to time given information to the public for the purpose of comparing favourably the day-labour system against the contract system, attempting to show how much has been saved here and how much has been gained there through

having works carried out by day-labour, says the *Building and Engineering Journal*, the Minister has not yet shown any inclination to point out how much has been lost in both time and money on any of the day-labour jobs which have far exceeded the cost for which they could have been done by contract. Perhaps one of the most glaring cases of the extravagance of the day-labour system, both in regard to waste of time and money, is furnished by the half-finished post and telegraph office at Newcastle, N.S.W., which has now been in hand so long, and which at the present rate of progress will take another two years to complete. Tenders were in the first instance called for this work by the State Government, being opened on September 11, 1899. The lowest tenderer was Mr. W. P. Graham at 17,711£, the next being Messrs. John C. Harrison & Son at 19,385£. Mr. Graham, evidently having quoted too low, withdrew from the job, and, being the second lowest tenderers, Messrs. Harrison & Son naturally expected that they would get the work, which they had undertaken to finish in eighteen months. Mr. Harrison interviewed the Minister for Works with a view to securing the contract, pointing out that there were numerous precedents upon which to grant his firm's request to be entrusted with the work, inasmuch as contracts had been let to the second lowest tenderers in previous cases. The Minister for Works, however, said it was impossible to give Messrs. Harrison & Son the work, owing to the fact that the departmental estimate was 16,000£ for the new building, which amount only had been voted by Parliament for it. The Minister decided to call for fresh tenders for the work, which were received in February 1900, and the result of this second tendering was that Messrs. Howie Bros were lowest at 19,229£. Messrs. Harrison & Son, no doubt in consequence of the way they had been treated in connection with the first tendering, refrained from sending in any offer at all. For some reason or other Messrs. Howie Bros. also withdrew from the contract, after which the Minister for Works proceeded to show how much the new post and telegraph office at Newcastle would cost if carried out by day-labour instead of by contract. As previously stated, the building is now only half finished, and has already cost over 20,000£, through being erected by day-labour, or 4,000£ more than the original departmental estimate for the whole work. According to the Federal estimates, the work will now cost 34,000£ odd to finish it, whereas it could have been completed months ago by Messrs. Harrison & Son, who were anxious to get the job in 1899, for

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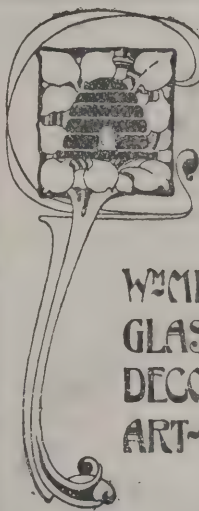
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the sum of 19,385<sup>7</sup>. In the face of these facts, it is very difficult to accept Ministerial representations as to the existence of any advantages of the day-labour system over the contract system. In the case of the Newcastle post and telegraph office, it is quite plainly to be seen that the employment of day-labour means that the work is to cost the taxpayers nearly twice as much as it would have done if carried out by contract. Any contractor could have finished this job comfortably in eighteen months' time; so the facts show that not only is there to be a great waste of public money in connection with the work, but also of valuable time. There is another point in this matter which paints the case all the worse for the day-labour policy of the Government. We believe that freestone has been substituted in the staircases in the building in lieu of trachyte, provided for in the tendering in connection with the work. This would have considerably reduced the estimates of contractors who tendered for the job had they been asked to use freestone for the staircases instead of trachyte. Attempts appear to have been made recently to put the increased cost of this building on to the Federal Tariff. This, however, cannot be swallowed at all by people who understand anything about the matter. It is sheer nonsense to argue that the Federal Tariff had anything whatever to do with the excessive cost of the bricks used in the building, being made locally, and the freestone being supplied from Sydney. Whatever imported ironwork there is in the building must have been on the ground or in position before the Federal Tariff came in. Had the work been done by contract, all ironwork required would certainly have been purchased long before the Federal Tariff came into operation, and the Government also had any amount of time and opportunity to purchase the ironwork needed before the tariff came in.

### HOUSE DRAINAGE AND PLUMBING.

A PAPER on "House Drainage and Sanitary Plumbing from an Inspector's Point of View" was read by Mr. J. J. Elliott at the Sanitary Congress, Manchester.

House drainage and sanitary plumbing in recent years, he said, have become prominent and important factors in the science of sanitation, and as these two are inseparably connected with our present mode of living, and the health of the masses influenced by them, it is essential that those in authority should study to have these factors as perfect as possible, and also have absolute control of them.

The control of drainage and sanitary plumber's work is of the utmost importance, and nothing should be spared by way of legislation to enforce good and thorough work. The local authority should have absolute control of both and have competent inspectors to see that these works are properly executed.

Authorised lists of drainers, as kept by many towns, are far from being satisfactory, and in innumerable instances the drains inside premises are broken into for cleansing, are altered or reconstructed, without any responsible official being acquainted with the fact, the result being that the drains are probably left in a very imperfect condition, and what may previously have been a drain as defined by the Public Health Acts may have been converted into a sewer by the juncture of some branch drain from an adjoining premises belonging to the same owner, thus increasing the responsibility of the authority. It should be imperative that no drain or sewer be laid, reconstructed, opened or uncovered without the consent in writing of the authority or their representative, penalties being imposed for non-observance; the same should also apply to all sanitary plumber's work. All such works should be tested and passed by the authority's inspectors.

Medical officers and surveyors have a variety of work and cannot devote the time necessary to the effectual carrying out of this work. In towns it would be a distinct advantage to have a properly organised drainage department, with a thoroughly practical man at its head, who could devote all his time and energy to this class of work. The practical advantage of this, with regard to thoroughly good work and uniformity of system, cannot be overestimated.

The testing of such work is of the greatest importance. In general practice the testing of drains by hydraulic and other tests is well known. But after a satisfactory application of this test it is not to be inferred that they will remain watertight—a side pressure of earth against the pipes, a settling of the ground under the pipes, the careless filling of the trench or the vibration caused by machinery in motion, would each be sufficient to make the drain leak. This being so, all drains, wherever practicable, should be provided with easy means of access and be provided with a valve or other arrangement, so that at any time the drains may be stopped and tested with water.

The testing of drains and sanitary plumber's work should be repeated at stated times, say once in three years, preferably by an inspector acting under the direction of the sanitary authority. Records of such testing could be kept by the authority, and if certificates were granted to owners of property,

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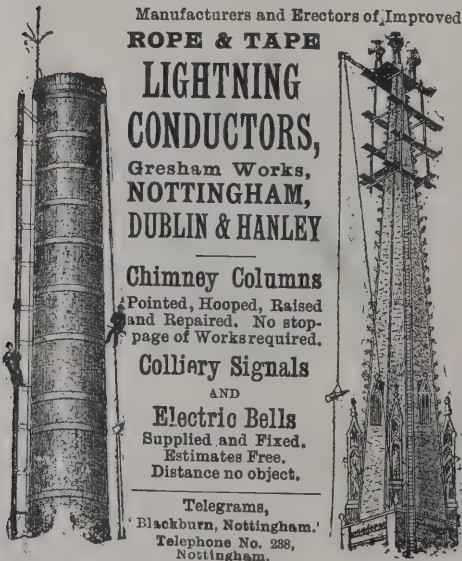
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iving date of testing with general remarks, much good would undoubtedly accrue. The authority would also be kept informed as to the condition of all drains within its jurisdiction. This would also tend to lessen diseases which are attributable to soils saturated with organic matter and to defective drainage and plumber's work.

Attention was also drawn to the desirability and usefulness of automatic flushing-tanks in connection with drainage systems, and also to the necessity of having all the soil which has been excavated from trenches around and in the vicinity of defective drains thoroughly disinfected by freely sprinkling calcium chloride or some other equally effective agent.

A uniform system of drainage and sanitary plumber's work is a thing very much to be desired, and many advantages would accrue if such a system existed. It would be hailed with delight not only by property owners, but by contractors, manufacturers and inspectors alike.

The registration of plumbers is truly a step in the right direction and should be heartily supported, but registration will not debar a plumber from scamping his work.

The fittings and pipes in connection with a water-supply are tested and approved with a view to the saving of water, and if at any time these go wrong the most that is likely to occur is an inconvenience to the occupants, and the leak is easily detected; how much more essential it is that the more important branch of the plumber's art—sanitary plumbing, which affects the health of the community—be subjected to a thorough and systematic inspection.

To formulate a model specification for a uniform system would take up more time than that allowed for this paper, but as a step toward something tangible, it is suggested that a council of experts in drainage and plumber's work be organised, preferably by the Sanitary Institute or other similarly influential organisation, to devise a suitable system and to recommend the same to the consideration of the various corporations and councils with a view to its ultimate adoption.

christ, to the solution of the utilisation of its phosphoric ores, while we in this country were only beginning to think about it; it employed the invention of Martin, another Englishman, combined with that of a naturalised Englishman, Siemens, to the production of ingot iron, an article that is now rapidly superseding puddle iron, despite every statement to the contrary; it applied the invention of Watt and the discoveries of other Englishmen with regard to the thermal conditions for obtaining the best economy in steam-engines. All this has been done with the result given above, and is very materially presented to anyone who has visited the excellent exhibition at Düsseldorf. We have recently heard a good deal about financial crises in Germany. These have no doubt considerable foundation in fact. But let us ramble about the "Black" counties of Westphalia and Rhineland. Let us judge by what we see, and not by what we are told. The people are not ruined. Let us compare Düsseldorf with Birmingham, as being the respective metropolis of the "Black counties" of Germany and our own Midlands. Perhaps it is misleading to apply the term "Black county" to the German Midlands, because we do not see there the thousand and one chimneys belching forth black fumes and other noxious vapours with their concomitant waste. Modern automatic stokers are largely employed. The fuel is washed of a considerable amount of its sulphur compounds and ash before use. The dust and small coal is not thrown away, but compressed into briquettes. Fuel is, whenever possible, gasified and so burned.

We are in our own district (thanks to private enterprise) attempting to go one step further. That is to supply a purer product such as the Mond gas to the works. But how are we receiving this new fuel? Unless we are very much mistaken, by all kinds of obstructions. We visit the alleys of Düsseldorf, the equivalents of our back slums, and what do we see? None of the degrading poverty rampant in many parts of this district and no counterpart of the "Hooligan" or "Peaky Blinder." We walk through streets well paved and almost invariably lined with trees. We see no equivalent of the street loafer. Even the flower girls are respectably dressed, bright and cheerful. On the other hand, we see no signs of excessive luxury. The directors and proprietors of some of the large works do not depress one with an exhibition of extravagant wealth. We do not meet the drunkard at midday and we certainly do not see anything of those debased specimens of humanity—men and women—who promenade the streets at night. The men are strong and on the average stouter than

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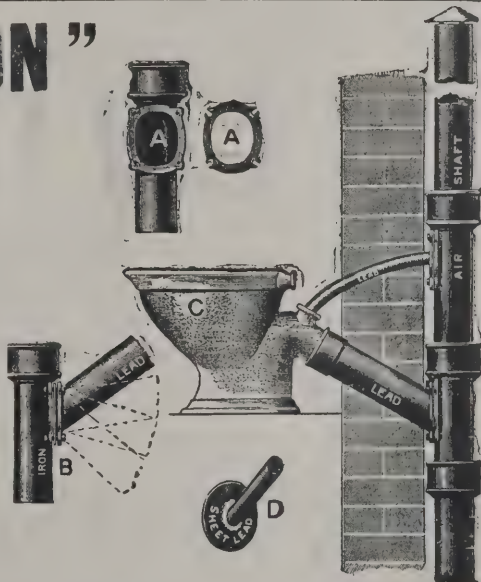
This junction has been invented with a view to enable anyone fixing closets overcoming the difficulty of the many angles required for the various makes, also to avoid the necessity of having joints inside the walls, which are dangerous and not allowed by County Councils, Borough Engineers, Architects, &c. The 4 inch Junction can be made to any size from 4 inch downwards. Any plumber will see at a glance the great convenience of this joint as it only requires one junction for the many shapes and sizes. No Brass Thimbles or Calking required. In fixing this Joint, it is necessary to cut the Lead Pipe to the required angle, place on the loose Iron Flange, then flange back the Pipe 2 inch all round, coat the face of Flange with a little Red Lead Putty, bring the two Faces together and screw up with the Bolts, screwing up each Bolt a little at a time until they are all tight, then the Joint is made and will stand any test. Another great convenience is:—In case of any alterations or renewal of Soil Pipes, all is required where this Junction is used is to unbolt the same, and the Closet and Pipe leading to it are left in position. With all other Junctions it is necessary to take down the W.C., break open the wall, damaging the Property and causing other inconvenience.

- Is the front view of Junction and loose flange; the inlet being elongated, allows the lead pipe to be cut to any required angle.
- Shows the Joint fixed and ready for tightening up, and also a few of the angles which can be got.
- Shows the one size which can be adapted for 4 in. Soil Pipe, and a 4 in. x 1 1/2 in. Invert Junction for Anti-syphon Pipes, &c.
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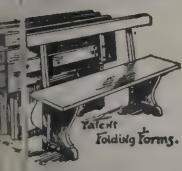
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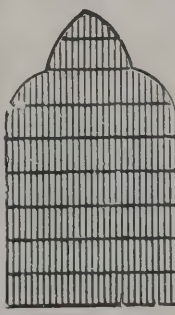
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our men. The women are always clean, neatly dressed and cheerful. There appears to be more order in the affairs of life from the highest to the lowest member of society. If this be the result of a compulsory military system, then let us have a form of compulsory military system. If this be the result of a better organised educational system, then let us reform our educational system on parallel lines, and that at once.

The economic conditions existing in the "Black country" of Germany have rendered it imperative in the case of mining that their collieries should be equipped with large plants, because the mines vary from 500 to 1,000 yards deep. Every modern device for the transport of material is to be found in these large undertakings. There are no small collieries as we understand them. All the mines are on a scale equivalent to the Sandwell Park or Hamstead collieries, and even larger. Most of these collieries are equipped with coal-sorting and washing plants. Small coal and dust is collected and made into briquettes. By automatic devices and gravity the coal is carried into the coking ovens, in which most of the by-products are recovered. Some of these are converted into manures and others sent away for the production of aniline dyes, drugs, scents, &c.

Then, again, we were impressed by the number of overhead ropeways carrying ore, coal and coke from the mines, wharfs or collieries to the top of the blast furnaces, as it were, in a continuous stream. Electricity is largely called into requisition for actuating these various subsidiary operations. It is a common sight to see five miles or more of overhead ropeways carrying coke from the ovens at the collieries to a neighbouring blast furnace. As at the works, so at the collieries the miners can purchase their beer at a restaurant controlled by proprietors of the mine, and excellent changing-rooms, baths and wash-rooms are provided for the miners. We pass on to the steel-works, which we find, as a rule, fully equipped with all the modern appliances for the movement of material such as overhead travelling and jib cranes worked by electricity, and whenever it was possible to prevent brute force or brute labour on the part of the men mechanical appliances were at once installed. The workmen are regarded as directors of various processes carried out by machinery rather than beasts of burden. Ingot iron is one of the chief products of the district. Structural work of all kinds and dimensions is undertaken. Cranes of colossal proportions for lifting 1,000 tons are constructed of the ingot iron or mild steel. Bridges and girders of all kinds and shapes are made. In one works we visited we saw a crank shaft being

made for the electric-light station or tramway of the Corporation of Manchester. The exhibition of Düsseldorf is unique in its representative character, and remarkable for the artistic display of such articles as coke, sewage pipes, fire-bricks, rails, bolts and nuts, tubes, ropes and wire, and unparalleled in size and finish of its prime movers. Steam dynamos are at work developing thousands of horse-power and compound colliery winding-engines of colossal proportions working like clockwork. One of the largest gas-engines ever built is at work at the Exhibition, proving the possibilities of using waste blast-furnace gases for blowing purposes and for other necessary operations in the metallurgy of iron.

It is not invidious to compare the excellent electrical tram service in Düsseldorf with the monstrous steam tram rampant in Birmingham and the disconnected condition of the tramways. One can travel from one end of Düsseldorf to another by means of the former. Transfer tickets are in vogue which enable one to step from one system to another at certain crossings. For the equivalent of one penny one can travel nearly five miles in beautifully-appointed electrical tramcars through streets which eclipse in beauty the Hagley Road. These cars are provided with open trailers so that smokers may enjoy their cigars to and from business. The tramway service has practically superseded all vehicular traffic. In other words the requirements of the districts are made paramount, and not subservient to the wishes of a few individuals. The streets of Düsseldorf are laid out on a scale equal to that of Hagley Road, even larger. Down its main thoroughfares, the Hofgarten and Allee Strasse, tramcars run without defacing the beauties of these streets. No thoroughfare in Birmingham can be compared to them. The streets are beautifully lit with arc lamps and the general use of electricity by the ratepayers is shown in the number of houses wired for and using electric light. Düsseldorf is not only the centre of industrial enterprise, but also a city of artistic excellence. As far as we can judge, there is one spirit underlying the whole of the industry of the "Black country" of Germany. It is the spirit on the part of workmen and employers to excel in all they do, and determination to prove to the world that the individual units of the Fatherland are no longer content to take a second position in the commercial enterprises of the age. It would be well if a considerable amount of petty rivalry that exists in our district was sunk, in order that a higher ideal, with its concomitant advantages, shall take root and blossom in our course.

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# The Architect.

## THE WEEK.

IN the competition for the Municipal Buildings, Deptford, forty-five designs were submitted. Mr. J. BELCHER, A.R.A., the assessor appointed by the Council to adjudicate upon the designs, placed the following in their respective order of merit:—First, Design No. 3—Messrs. LANCHESTER, STEWART & RICKARDS, 1 Vernon Place, Bloomsbury Square, W.C. Second, Design No. 32—Messrs. S. B. RUSSELL & C. E. MALLOWS, 11 Gray's Inn Square, W.C. Third, Design No. 27—Mr. ARTHUR J. GALE, 4 Serjeants' Inn, Fleet Street, E.C. The Council think that the authors of the designs submitted would like to see the same, and have made arrangements for their exhibition at the Sayes Court Hall, Evelyn Street, Deptford, to-day (Friday) from 10 A.M. to 5 P.M. Sayes Court Hall is within the Sayes Court gardens and grounds.

ALTHOUGH there is a prejudice against cast-iron beams, which can, however, be utilised in many cases, yet casting in a broad sense still remains among the most important varieties of human industry. Great tensile strength is not always requisite, and an immense quantity of most useful articles as well as machines can be produced in which the tensile limits of the material need not be exceeded. The first part of a book on "Iron Foundry Practice," by Mr. G. R. BALE (the Technical Publishing Company, Ltd.), has appeared, and it gives information in its 400 pages about moulding and casting in a wide sense. It is one of the cheapest technical manuals which has lately been put on the market. The chemical aspects of cast-iron have not been hitherto sufficiently considered. The success of chill castings and malleable castings are suggestive of the improvements which can be attained. About the latter the author writes:—"The malleable cast-iron industry, although, comparatively speaking, still in its infancy, is undoubtedly of great importance. Never before has any metal known to the iron-casting industry attained the position already occupied in the commercial world by the malleable casting, while perhaps the most gratifying feature connected with its manufacture arises from the fact that wherever it has been introduced it has invariably developed, to the exclusion of other metals." It may be granted that some specimens of malleable casting are imperfect, but that arises mainly from defective knowledge of what is sought. Chemistry is particularly necessary in dealing with all the operations, and where reliance is placed on chance rather than science the products cannot be always satisfactory.

CONTRACTORS who employ steam-rollers or road locomotives are sometimes indifferent to the provisions of the Locomotive Act. A man, for instance, may not always be in front of the engine and steam is occasionally blown off in the road, although the Act prohibits both negligencies. A case which was heard a few days ago in the Portsmouth County Court suggests how easily accidents may arise from both causes. Three men were driving in a trap between Gosport and Fareham when they observed a traction-engine with trucks. The horse became frightened, but the driver, according to his own account, took care that he went steadily towards the locomotive. Just as the trap came near steam was blown off, the horse was alarmed and bolted, the trap toppled over throwing the occupants. The driver, who brought the action, said he was for several weeks under medical care and was unable to do any work. The engine-man stated it was impossible to let off steam as the engine was working at a pressure of 100, while the safety-valve was gauged to 120. He ascribed the accident to the plaintiff's taking his right hand off the reins in order to return a salute. The horse swerved and it was in the effort to restrain him the mishap occurred. A witness said he heard the plaintiff give a similar account of what occurred. Judgment was given for the defendant with costs. Fortunately the accident was not serious, and the result was not inequitable, but not much was required for the accident to have more serious consequences, and then the County Court judge could hardly fail to give a decision in favour of the plaintiff, or we might even suppose that in

the higher Court there would be not one, but three actions against the builder.

EUGÈNE FROMENTIN died in 1870, in his fiftieth year, and he is still without a memorial. A committee has been formed in Paris, with M. BOUGUEREAU as president, for the purpose of atoning for the neglect of thirty-two years. It is proposed to solicit 400*l.* from the municipal council of La Rochelle, the birthplace of the artist, and then to appeal to all Frenchmen for the remainder of the money which will be required. FROMENTIN was a remarkable man; he had gained some reputation as a landscapist when, like some other French painters, he was attracted to Algiers. But instead of a hurried visit he resolved to settle for some time in the country and live as an Arab. He wrote two books which were attractive, as they were the first to suggest the peculiar character of the desert as seen by a painter. Many books about Algeria have since been issued, but not one of them gives so deep an impression of North African life, and the two will be found delightful reading, especially by those who are confined in cities. FROMENTIN's paintings of Arab life bear the stamp of truth, although perhaps it might be said of them, paradoxical as it may seem, that they are not suggestive of the conventional notions of Arab life which have been founded on pictures that were not entirely completed in Africa. Some of his paintings are now in the Louvre.

ON July 18 last the Villa Borghese was to be sold by auction. The announcement was not credited in Rome, for so little restriction has been placed upon visitors, the people ultimately came to look on it as if it were one of their own possessions; in fact, they were less at home in some of the national buildings and public places. The villa was designed by GIOVANNI VANSANZIO, better known as "Il Fiammingo," but several of the princes enlarged and otherwise altered it. The museum was of universal renown, and it was purchased by NAPOLEON for 13,000,000 francs in order to enrich the Louvre. A great many of the works are still found at Paris, but those removed have been succeeded by others which were also remarkable. In recent times pains and penalties were incurred for sales of works of art by the Borghese family to foreigners, regardless of the terms of Cardinal PACCI's law. The mortgages and other claims on the property amount to 5,247,676 lire. It would be risky for any stranger to buy the villa, and the Italian Government, therefore, resolved to contribute 3,000,000 lire towards the payment of the debt, part of the sum being fines which had been imposed for breaches of the Pacci law. The King of ITALY has now arranged to supply the balance, and the villa will thus become the property of the city of Rome. In the grounds it is likely that a memorial of King HUMBERT will be erected.

AMONG the uses which honey subserved in antiquity was the preservation of dead bodies from decay. In Greece or Rome it does not appear to have been systematically employed for that purpose, and in consequence some doubts have been cast upon the practice. An inscription has been brought to light in Telmessos, in Pisidia, which was a part of the province of Pamphylia, and was the scene of a portion of FELLOW's explorations. The words of the tablet are:—"Here sleeps the sleep of eternity a man to whom the muses confided the gift of eloquence. BOETHOS lies in sweet honey." This is sufficient to confirm what was stated about the use of honey, or, it may be, of wax, as an aid in the process of embalming. It is presumed that the practice was more common among Babylonians and Persians than among Europeans. The kings of Sparta were distinguished by its use, and, in fact, the use of wax, it is believed, was restricted to princes and nobles. We cannot now realise what form was assumed by the honey or wax, but it is reasonable to conclude that the appearance of an encasement of wax would suggest waxen portraits which at one time were used not merely for public purposes, but as a means to preserve the portraits of people in their families. PLINY speaks of VARRO as rendering great service not only by the publication of the lives of about 700 personages, but by joining thereto their portraits. WINCKELMANN thinks he means portraits in plaster, but by others the passage is interpreted as referring to portraits in wax. Wax is still employed for portraiture.





PAINTERS' ARCHITECTURE: DOMENICHINO.

## CANADIAN ARCHÆOLOGY.

THERE was a time when archæology was generally restricted to remains which were suggestive of ancient life in Græce and Rome. By degrees the limits of the science were widened. The greater part of Europe was considered to be worthy of attention. The final stage was the recognition of the vast continent of America as a field of archæological research.

The problems which are offered there are manifold. At present a voyage across the Atlantic occupies a few days, but before steam navigation was perfected it was a tedious undertaking. As it was assumed that the cradle of the human race was in Asia, the first effort was to discover how the emigrants were able to reach so remote a region by means of boats which had to be impelled by oars. In endeavouring to answer the question, controversies have arisen not only between archæologists, ethnologists and historians, but geologists also, for they have interfered as if they alone were capable of solving the puzzle. In other words, the difficulty is so great, the easiest solution is to suppose that at one period there was continuity between east and west, if only by a narrow isthmus, which facilitated emigration. The possibility of an independent origin for the American race is so revolutionary of accepted beliefs that few of those who have taken a share in the contest have ventured to suggest it.

Often it has been said that one of the drawbacks of the United States is the absence of antiquity. Not even family ghosts are to be found in any of the new and popular cities. But the Government were wise enough to take measures for the demonstration of the existence of states, governments and civilised life on the Western Continent long before COLUMBUS made his daring voyage. The various ways in which archæological knowledge has been consequently extended are startling. The colossal architecture of parts of South America had been made familiar by the books of CATHERWOOD, STEPHENS and other travellers. There was, however, much else discovered afterwards which seemed strange to European builders. The cliff dwellings of Arizona and Colorado were unlike any examples with which European archæologists were acquainted. The globular adobe bricks were another novelty in building materials. The aboriginal communal dwellings suggested that some modern theories had been known and acted on long ago among tribes of Western Indians. Remains of buildings by the Maya show that they were competent to employ the ancient Mycænean method of forming arches by means of advancing courses or corbelling until they met at the summit. It was supposed that the utilising of earthenware drain-pipes for chimneys showed ingenuity, but the American Indians could improvise chimneys out of their earthenware cooking vessels. The great mounds known as the "Huacas" have sometimes an area of 10 acres, and were proofs that the effect of mass was no less appreciated across the Atlantic than in Egypt.

The success of the United States archæologists incited similar attempts in Canada. But it could not be expected in so poor a country to have the study of archæology carried out on as suitable a scale. There are no immense examples of masonry to convince the inhabitants of the existence of earlier and mysterious races who possessed skill in architecture. Wherever the inquirer turns in Canada, he finds nothing which is not in some way related to the Indian tribes with whom he is acquainted, or at least can have occasional glimpses of them. He does not admire or trust them. The former denizens of the country, however humble in the scale of civilisation, merit at least attention, and, moreover, as archæology is widely related, it would not be extraordinary if some of the evidence obtainable in Canada afforded aid towards the solution of prehistoric problems in Europe.

At any rate, England and Canada are in co-operation in conducting an ethnological survey. In this country the prime movers are a special committee of the British Association. The provincial governments, as well as the Dominion Government, have afforded aid, and it is hoped that in time the survey will be organised on a permanent basis, and that museums of local antiquities will be established throughout the country.

The last report is interesting, for it contains an account of the investigations of Mr. CHARLES HILL-TOUT among the Lower Frazer Indians. It is believed there are fourteen or fifteen separate tribes. They occupy the extreme west of Canada, in British Columbia, and are found on Vancouver Island. It might be imagined that as a result of that "moving on" which is like a command of destiny, they had been driven to the extreme limit of North America and had no course before them but to die or trust themselves to the ocean. These Salish tribes use dialects which are to some extent intelligible to Indians of the same race, however divided, with the exception of Halkomelem, men to whom Mr. HILL-TOUT's attention was mainly directed. They sometimes form very small village communities having from one to twelve adult males. They have no traditions of an ancestral home. They believe their ancestors always lived in the same region, looking on the same sky and the same mountains. The few traditions which have survived are not credible to the younger members, for, like polished Europeans, they are sceptical about whatever suggests the greater glory of former ages. A community seems to have been divided into chief, notables and common folk, slaves being also known. The chieftaincy was in most cases hereditary, although the chief could be deposed at the will of the people. He was a director rather than a ruler, and, in fact, the office was more sacerdotal than imperial. At the present time if a white minister or instructor should be absent the chief takes his place in church. To depose a chief was a rare act, and he was succeeded in his position by some member of his family. There was a war chief but no warrior class, and any fighting that arose was commonly caused by the invasion of hunting-grounds. Their per-



manent habitation was in a communal "long-house," a kind of dwelling which arose out of the desire for mutual safety and protection, and which was also common in parts of the States. The influence of the building has not been without its effect on the character of the people. The communism is concluded to be the result of the long-house, and the dances which serve instead of dramas are still performed in the buildings during winter days and evenings. Mr. HILL-TOUT gives the following description of one:—

The permanent habitation of the Tcil'qē'uk was the communal "long-house." The adoption of this style of dwelling, I learnt, was primarily for purposes of mutual protection and defence in cases of attack. It can readily be seen that such houses would be imperatively needful where the community was small, the number of males limited, and the tribe surrounded by hostile and predatory bands. Later, when this need was no longer felt, custom and a recognition of the social advantages of such a structure would operate to perpetuate this mode of building. I think there can be but little doubt that these dwellings, first erected for mutual safety and protection, have profoundly affected the social life and customs of the Indians using them. The communism of the Halkōmē'lem and coast Salish tribes doubtless grew out of it; likewise their character dances, which are invariably performed during the winter days and evenings in these long common houses. The long-house of the Tcil'qē'uk was of the half-gable or single-slope pattern, the front or higher side rising to 25 or 30 feet. The interior was equally divided between the different families of the tribe. Each family was entitled to a space eight talcs\* square. When the tribe was populous these houses would extend in an unbroken line for several hundred feet. The chief always occupied the centre. In this custom we have plain evidence of the truth of the statement made to me by the Indians, that they adopted this style of house primarily for protective purposes. The chief—the father and head of the tribe—whose loss would be most severely felt, is always lodged in the securest portion of the structure. On either side of him dwell his brothers, the elder ones coming first. After them come the lesser chiefs and notables, and beyond these again the common folk. There were commonly but two doors to these dwellings—one at each end. In the interior the spaces allotted to family use were separated by hanging mats or screens of grass or reeds. On festive occasions these were taken down and the divisions thrown into one. The beds were formed by reed mats laid one upon another, the head-rests or pillows being rolls of the same. The coverings of the meaner class were of the same material; the wealthier supplemented these by dressed skins and blankets made from the wool of the mountain goat. The "keekwilee," or underground winter-house, was also occasionally used by some of the Tcil'qē'uk, and known to them by the term *skem'el*. *Lā'lem* is the name by which the long-house was known, which, to judge by the *lam* of the Sk'qō'mic and other tribes, is the collective form of the term.

At the last meeting of the British Association Dr. HADDON made "Totemism" the subject of his presidential address in the anthropological section. Various definitions have been given of this word. Dr. HADDON followed Dr. FRAZER in believing that totemism, when fully developed, implies the division of a people into several totem kins, or totem clans, each of which has one, or frequently more than one, totem, "the totem being usually a species of animal, sometimes a species of plant, occasionally a natural object or phenomenon, rarely a manufactured object." Mr. HILL-TOUT explains the extent to which totemism prevails among the Indians who are the objects of his study. Like Dr. HADDON, he is of opinion that the totem was evolved from a fetish or talisman, for he says:—"That the peculiar clan totem of our northern tribes is the further evolution and natural extension of the personal totem becomes equally clear under the study of the origin and spread of personal and family crests and emblems; these standing in the same relation to the clan totem as the fetish does to the personal totem. These crests and emblems, formerly so highly esteemed and jealously guarded by those entitled to them, which entered so largely and affected so profoundly the social life and organisation of our coast Indians, are seen to have originated in two different ways. One springs from pictographic or plastic representation of the *su'lia*, as among the interior Salish and the northern Alaskan tribes; the other is an emblematic record of some event or adventure,

more or less mythical, in the life of the owner or his ancestors."

The *su'lia*, which represents a protecting influence, is not only found on weapons, utensils, clothes, but among the Halkomelem tribes it is painted or carved on the posts of the house and on the family corpse-box. It is to some extent a recognition of individuality in the midst of a communistic society. The subject is particularly interesting, for the efforts of the Indians are suggestive of the true foundation of heraldry as well as of the badges which have been of so much importance in uniting Scotsmen and in the mutual desire to assist one another which is known as clannishness.

Mr. HILL-TOUT has been occupied with the archæology of the territories of the Halkomelem tribes during the past ten years. He divides the remains into middens, burial-mounds or tumuli. One remarkable example is described by him which he met with on the north arm of the river Frazer. Since the midden mass was formed, a forest with trees from 4 to 8 feet in diameter has grown upon it. From sections of the trees it is evident that they are at least 500 years old. Nature has therefore taken possession of the place where prehistoric men had collected. The midden was composed of the decaying remains of marine shells with enormous quantities of ashes, calcined and fractured stones. The skulls found are unlike those of the modern Indians. No pottery was discovered, and Mr. HILL-TOUT concludes that the ceramic art appears to have been wholly unknown to the ancient as well as to the modern Indians of British Columbia. Instead of moulding and baking clay, they hollowed their bowls or basins from stone. They looked to nature for typical forms, and some of their utensils resemble animals and fish, the bear, frog and salmon being the favourite models. Occasionally, the bowl was shaped into a human head with a face on the exterior. As in Europe, they made spear and arrow points from bones, and axes, knives, chisels and scrapers from stone. Stone swords were a favourite weapon; some were like the short double-edged Roman sword, while others in cross section were similar to a belaying pin.

The middens are puzzling. Mr. HILL-TOUT holds that they must have been formed at least 1,000 years ago. But as the changes in the language spoken might be accomplished in half that time, he cannot believe that the middens could have belonged to ancestors of the Halkomelem tribes. The later middens are of a different character, and are thought to be old camp sites of existing tribes. The shells in them were so abundant and so well preserved, the early settlers were able to profitably convert them into lime. The relics are mainly in stone, and there is no such quantity of bone specimens as in the older middens. But the relic-hunters have been at work, and many interesting specimens are to be seen in the New York Museum.

The burial mounds have not yielded many relics. Separate interment was practised. From the presence of charcoal it is assumed that cremation was a custom especially in Vancouver Island, but whether the body was subjected to it or only the food, clothes and belongings of the deceased person remains uncertain. One class of sepulchral mounds were enclosed with boulders, and as they weighed from 25 to 200 lbs. each the total weight in some cases must have been from 25 to 30 tons. Sometimes the stones or boulders were piled in a conical form, as in Scottish cairns.

The most remarkable peculiarity in the tumuli is found in layers of sand that are at times disposed in a variety of colours, dark reddish or brown alternating with layers of clay and dark grey sand. In every case the sand appears to have been brought from a distance. What purpose the sand was intended to serve is not to be ascertained, and why it should be necessary to undergo the trouble of bringing it from a distance instead of using the sand in the neighbourhood will perhaps be always a mystery. A practice of this kind, which is entirely unknown even by tradition to the modern Indians of British Columbia, adds new interest to the difficulties of the subject. All that is evident is that in the district through which the Lower Frazer River runs in British Columbia there was once a people who had established customs about burials, as we can see from the character of their graves, but where they came from and how they vanished are questions to which no answer is

\* A *talcs* was the length of the interval or space between the outstretched arms of a man, measured across his chest from the tip of the middle finger on one hand to the corresponding point on the other.



forthcoming. There is no link by which they can be connected with the present Salish tribes that are among the KING's subjects, and who are supposed to be comparatively new arrivals, although they have no clue to the place of their origin. Future explorations may reveal evidence to enlighten us, but the rewards which such work offers in Canada, however interesting, cannot vie with those that are anticipated when digging in any part of Greece or of the Roman empire.

#### CHIMNEYS IN PARIS HOUSES.

THE sacrifice of a celebrity is sometimes necessary in order to have a reform introduced. It will not be the fault of some French journalists if the sudden death of the late EMILE ZOLA does not lead to an improvement in the chimneys of Paris. That one is needed is demonstrated by the remarkable variety of chimney-pots which can be observed in the city. There is so much to be admired on the line of sight in the streets of Paris, both natives and visitors avoid raising their eyes to the roofs. They are wise in controlling their vision. The spectacle of an assemblage of contorted tubes at variance with the fine masonry of the façade beneath as to appear like the work of another class of beings who are inimical to architectural effect, does not gratify the spectator. Parisians who possess the power of ignoring the forms which crown their homes are, however, sarcastic on those seen in foreign cities. THÉOPHILE GAUTIER, for whom the grotesque offered attractions, considered the chimney-pots to be the only things in Geneva which were suggestive of a little imagination among the people. He compared them to the English acrobats or acropedestrians, but with the stipulation that all of the profession in the world had collected in the most serious of capitals. With habitual honesty he admitted that Geneva was only a place of rehearsal for Paris. It was in the latter the "fumistes" were able to triumph.

The French stoves, or "calorifères," are as a rule of graceful form, and, it may be allowed, are never over-ornamented. The principles, as explained by inventors, are scientific, and on that account the honours obtained by the stoves from exhibitions are deserved. But no science or art can overcome the danger of the stuff which has to serve in many cases for fuel. A stove is supposed to "burn anything," and the tests of its efficiency are of the most diversified kinds. In that way the danger generally arises, instead of from the construction. But in the construction of chimneys there is also carelessness, and on that subject M. GEORGES BOURDON has been enabled to contribute to the *Figaro* the opinions of M. BOUVARD, the director of the architecture of the city of Paris, as well as of M. CATTI, who is, we suppose, a Piedmontese, like the majority of the chimney doctors of France, and who fills the office of "Président de la Chambre syndicale des entrepreneurs de fumisterie."

M. BOUVARD admits the prevalence of danger of which the death of EMILE ZOLA afforded sinister evidence, but he refuses to acknowledge that his department is in any way responsible for the consequences, however fatal, as their power can be called hardly nominal. It is true that in the by-laws and regulations of Paris much is said on the subject of chimneys. As recently as September 1901 an amended code was issued. The length of chimneys, the inclination of flues, the thickness of the material employed are three points on which there are formal regulations. But what effect have they? All the plans for new buildings have to be passed by M. BOUVARD's department. Care is taken to see that they correspond with the enactments. When the building is completed an "architecte-voyer" must undertake an examination. But he has to judge by what is visible, and has no authority to make openings in the walls in order to ascertain the character of the flues. Should complaints be raised by occupiers, then the "Commission des logements insalubres" will proceed to the place indicated, verify if possible the cause of the complaint and send a formal notice or summons to the proprietor. The latter can treat the document as waste-paper, for he knows that while in a case of urgency relating to defective construction the department of architecture can take down a balcony which threatens to become a danger to passers-by,

it possesses no actual powers to insure salubrity. The power begins and ends with the promotion of security. According to M. BOUVARD there is some hope that a remedy will shortly be found. A measure has been passed which has only to be put into working order in order to be exercised. The Commission of insalubrious lodgings can then do something more than remonstrate, for it will be empowered to inflict penalties for any transgression of the regulations. It is not to be supposed that carbonic acid or oxide of carbon will no longer be present in Parisian apartments, but tenants can have the satisfaction of knowing that municipal officers exist who can endeavour to pursue proprietors for neglecting to take measures against insanitary defects.

M. CATTI looks at causes and effects more closely. A chimney, he says, may be closed (*bouchée*) by an accumulation of soot, spiders' webs or birds' nests. It can be cleaned by the sweeps. It does not follow, however, that because the sweep's brush is forced along the flue at the beginning of every winter that a room is free from danger. There may be breaches in neighbouring flues through which the gas from one passes into the other and into the "appartement." Warm air charged with gases may find an entrance by many other ways. The arrangement of the flues may be imperfect. There was, it is stated, an elbow of which one side was almost horizontal in the room occupied by EMILE ZOLA, and that was one of the causes of his death. At the outlet a chimney may also be dominated by adjoining buildings, and the smoke cannot escape. M. CATTI also maintains that tapestries, hangings, cushions, &c., diminish the power of a chimney, and that a part of the gas is attracted within a room by them instead of travelling to the external air.

M. CATTI is in favour of wood as a fuel; for of all means of heating it is, he says, the healthiest and the least perilous. But the movable slow combustion stoves which the French demand he regards as menaces to life. The thin column of warm air which is emitted from them, and which should be accompanied by all the oxides and the carburets of hydrogen produced by combustion, is not always strong enough to struggle against the column of cold air which fills the flue, and must succumb to it. M. CATTI also believes a kind of verdigris is formed by the agency of French stoves, which not even pottery can resist. The tubes suffer in consequence, and irregular outlets for the escape of gases are thus provided. M. CATTI says he has had lately to reconstruct the chimneys of two adjoining houses which were deteriorated by that cause alone.

It is believed that EMILE ZOLA might have escaped death like his wife if he had not fallen while endeavouring to reach the window, and thus was enveloped in a stratum of air in which carbonic acid prevailed. M. CATTI was able to give particulars of another case which supported that theory. Two children of a professor of chemistry became seriously ill while the man and his wife remained in their customary state of health. The physicians were powerless. The chemist, who may have heard of Dr. CARNELLY's experiments, resolved to test the air derived from the room at the level at which it was inhaled by his wife and himself and at the level in which the children breathed. It was proved that while the latter was infected, the former was comparatively pure. The perilous stuff which came from the stove, being of greater specific gravity than ordinary air, could not rise, and was the poison through which the children suffered.

The modern builder's work in France does not satisfy M. CATTI. He described the houses as "châteaux de carton," mere structures of cards. Beautiful mansions are sought, but people will not pay the price required for good work. Everything has to be of the cheapest. The architects reduce the estimates of the contractors, the proprietors cut down the estimates of the architects. Then what happens? Inferior materials are utilised, and the workmanship is indifferent. For flues earthenware pipes are employed of the requisite thickness, but the jointing is neglected. The French architects no more meet with the approval of M. CATTI than the French stoves. They have, he asserts, the strangest theories about air. A hole is made in a façade, a grille is inserted in it, and the architect believes he has secured ventilation, but there is no conduit behind and the hole is valueless. M. CATTI mentions



that a few days before he had to demolish a chimney which did not work, and he was surprised to find that the flue after a certain height was confounded with another in a neighbouring house. The arrangement was prohibited by the municipal regulations, but the architect said it was perfection. There was death in each of the rooms with which the flues were connected, and, of course, the chairman of the fumistes has drawn a conclusion about the responsibility for them. On hearing the story M. GEORGES BOURDON recalls the legend, which is as popular in France as in England, of the architect who did not provide for chimneys until after the fireplaces had been constructed. M. BOURDON suggests that the architect in question was wiser than his modern successors in Paris. But how is the blame to be divided in such cases as EMILE ZOLA'S, where the stove in the appartement was as ineffective as the chimney?

### THE ROMAN FORT AT GELLYGAER.

THE following report of the exploration of the Roman Fort at Gellygaer has been prepared by Mr. John Ward, F.S.A., of the Cardiff Naturalists' Society:—

The village of Gellygaer lies between the Rhymney and the Bargoed Taff valleys, near the north-east border of Glamorgan, and at a distance of thirteen and a half miles N.N.W. of Cardiff. It occupies a high position (780 feet above the sea), and commands an extensive sweep of characteristic coal-measure country, for this village is in the heart of the eastern part of the South Wales coal-field.

The site of the fort is in a field to the north-west of the church, which has time beyond memory borne the name of Gaer Fawr (great camp). Here a number of low mounds bore witness to the significance of the name, for to an experienced eye they marked the outline and chief buildings of a typical Roman fort. The position is not naturally strong, yet it is well chosen. It occupies a commanding position on the brow of Nant Cylla, but is overlooked by rising ground on the north-west.

The exploration, for which permission was given by the owner of the property, Mr. Capel Hanbury Leigh, J.P., began in October 1899, and was continued during the warmer months each year until the end of autumn, 1901. During its progress the whole of the site was sufficiently excavated to admit of a survey being made of all the buildings, some of the more important being wholly uncovered. It shares with Housesteads on the Roman wall in Northumberland the distinction of being the most completely explored Roman fort in this country.

The survey of the remains, made by Mr. J. W. Rodger, of Cardiff, presents a typical Roman fort, singularly complete and characterised by great simplicity. The outer line of defence, it will be observed, is the usual ditch, which, in the case of Gellygaer, was crossed at the gates by bridges; the inner, an earthen rampart, faced on both sides by retaining walls. This rampart is pierced by four gates, one about the middle of each side. Besides the chambers which flank these gates there are twelve others, probably the basements of towers, at approximately equal distances along the rampart, one being at each corner. Connecting the lateral gates is the wide transverse street, the Via Principalis, and midway on its south-west side is the forum-like structure invariably found in these forts and usually denominated the Prætorium. This structure, as usual, breaks the continuity of the longitudinal street. The rest of the site is occupied by buildings of several types, corresponding in the main with those of other forts.

The length reckoned from the external face of the rampart is 404 feet and breadth 385 feet, so that this fort is one of the smallest of the British excavated series, and it is a shorter oblong than usual. Another peculiarity is the backward position of the Via Principalis.

The various buildings, including the rampart revêtements, were found to rarely remain to a greater height than 3 feet above the Roman level. They were constructed of the local Pennant grit-stone, a hard, thinly bedded rock, which is still the chief building material of the district. The masonry may be described as regularly coursed rubblework, but it varied considerably in quality. The gates, for instance, were neatly constructed of well-selected stones, many of which were more or less dressed. Some of the walls of the buildings of the interior, on the other hand—probably sleeper-walls to support superstructures of timber—were built of rough stones as quarried, with an admixture of weathered field stones. The voussoirs of the gate arches were of calcareous tufa.

Mortar had been used in all these walls, but it was found, as a rule, to have decomposed into sandy loam of the same colour as the surrounding soil. This proneness to decomposition was apparently due to the use of "white" lime, *i.e.*

lime derived from carboniferous limestone, and the inability of getting a suitable sand in the district. This limestone, together with the calcareous tufa just referred to, is found in the vicinity of Castle Morlais, ten miles to the north-west.

The foundations of all the outside and of most of the divisional walls were deep and well laid, consisting of rough quarried and field stones, roughly coursed in the case of the more important walls, and packed on end in the case of the less important.

The roofs of several of the more important buildings had been covered with red tiles of the usual Roman type; but from the absence of roofing tiles of any sort on the sites of others, particularly the "long" buildings, it may be inferred that these buildings had been thatched or covered with wooden shingles or planks.

The ditch was found to be of a shallow V-shape in section, approximately 19 feet in width from lip to lip and 7 feet in depth; and owing to the tenacious character of the natural soil the sides were singularly well preserved. The excavation in front of the south-west gate showed that each side of the ditch had been cut back so as to leave a step about 2 feet from the bottom, obviously to serve as a platform for the supports of a bridge, and from the absence of masonry it may be concluded that the bridge was of wood.

As already stated, the rampart was of earth (evidently derived from the ditch) and confined between two walls. The outer of these walls varied from 3 feet to 4 feet 3 inches in thickness, and the inner was considerably thinner. Both walls had been built against the earth bank. The total width of the rampart varied from 19 feet 4 inches to a trifle over 20 feet.

All the gates, so far as could be judged from their remains, were of similar design and size. They were double, that is, each contained two passages, 11 feet long and wide, separated by an intervening spina. Front and back these passages were narrowed to portals 9 feet 6 inches wide by projecting jambs or pilasters, which doubtless had carried arches, as the fragments of voussoirs of calcareous tufa were plentifully found on the sites. On either side of the pair of passages was an oblong guard-chamber about 11 feet by 9 feet 6 inches (internal measurements), entered by a narrow doorway in the back.

The whole structure (passages and guard-chambers) was within the width of the rampart, and the front pair of portals was set back nearly 6 feet behind the front line of the rampart. These portals had been provided with two-leaved doors, which turned on pivots. These in closing stopped against a rim or sill of stone which crossed the threshold, and in opening fell back into the recesses made by the projection of the pilasters. In one of the passages of the south-west gate the raised sill, pivot holes and bolt holes were found intact, the former consisting of two flagstones end to end, and set on edge in the ground, the upper edge being worn by traffic.

From the presence of red roofing tiles on the site of the north-east gate it is probable that the gates were roofed with these tiles.

The building (VII) designated by some the Prætorium and by others the Forum was the most central and probably the most important feature of the interior of the fort. It was oblong in plan, 80 feet by 68 feet, and was of simple type, consisting of (a) an interior courtyard entered from the Via Principalis, and surrounded on three sides by a narrow-roofed ambulatory, and (b) a posterior portion consisting of a space which may be regarded as the enlarged ambulatory of the fourth or far side of the courtyard with a range of five rooms opening into it. The middle room was distinguished from the rest by its external projection, in this respect resembling the corresponding room in some of the German prætoria.

On the north-west side of the Prætorium was a house-like structure (VI), consisting of a series of rooms which opened into a corridor surrounding a small central court, entered from the Via Principalis.

On the opposite side was an enclosed yard, which also had its chief entrance from the above street. This yard was not fully explored, but the trenches sufficiently showed that it was used for various purposes.

Between these and the lateral gates were two remarkable buttressed buildings (V. and VIII.), each about 83 by 35 feet. Remains of similar buildings have been found in most Roman forts, but nowhere else have they supplied so many hints as to their original construction and arrangement. Each of the Gellygaer examples consisted of a middle portion having a raised floor of wood or other perishable material, supported upon a number of parallel sleeper walls. In these walls and between the buttresses of the external walls were openings, evidently to allow of the free circulation of air between this raised floor and the ground. The roof above had been tiled in the usual way. At each end were the remains of a sort of portico, containing an entrance into the middle portion, reached by several steps. Of the various conjectures as to the use of these buildings the most feasible is that they were store-houses.

The four buildings described above formed a range along



the south-west side of the great cross street, the rest of the interior being occupied by a number of narrow transverse buildings, which apparently had been thatched, for no roofing tiles of any sort were found on their sites.

Six of these (I., II., XII., XIII., XIV., XV.) were alike, L-shaped, and their average length was 145 feet and width 36 feet. For about two-thirds of their length (corresponding to the upright limb of the L), however, the actual wall on one side was recessed or set back about 6 feet, the full width being maintained along this portion by a row of nine posts, which evidently supported the overhanging roof, forming a verandah. Buildings of a similar shape, but with stone pillars instead of wooden posts, have been found at Chesters (Cilurnum), in Northumberland. As these were divided into a number of narrow apartments opening on to the verandah, it is probable that the Gellygaer examples were similarly divided, only by wooden instead of stone partitions. These buildings were probably used for barracks.

The other long buildings differed from one another in shape and size, and it is likely enough that they were used for different purposes.

A complete memoir of the exploration, with plans, &c., drawn up by Mr. John Ward, F.S.A., for the Cardiff Naturalists' Society, is now in the press. Application for copies should be made to the hon. secretary of the Society, Dr. William Sheen, Cardiff.

### A SUSSEX MANOR.

NOT everybody in Sussex knows "the manor of Streatham," though most people are familiar with Henfield. A few days ago, says the *Sussex Daily News*, Mr. W. B. B. Freeland of Chichester, held at Henfield a court baron of the Ecclesiastical Commissioners, as deputy steward, and showed that, with his customary thoroughness, he had been at great pains to find out all he could about the manor of Streatham. It seems that when he took over the stewardship of the manor he was unable to find anyone who could tell him the bounds of the manor or the customs, or why the manor was apparently in two detached portions, but it occurred to him to search the cathedral register and library, and he there found first of all a survey of the manor made in 1647 by direction of the Long Parliament, who conceived the idea that it would be a right thing to annex the whole of the property of the archbishops and bishops throughout England, and as a preliminary to that step they had surveys made of the manor and sent commissioners down to Henfield; and thus the Long Parliament had preserved for them what they otherwise would not have had, and that was an accurate survey of the manor, describing the whole of the bounds, the copyholders and freeholders, and setting forth the customs and everything connected with the manor.

This still, however, left open the question how the manor was apparently severed into two parts, and it occurred to Mr. Freeland to consult the Domesday Book, and there he found the solution of the question, for on looking to the excellent map attached to the Domesday Book, he found that the cultivated lands in Sussex ceased on a line drawn east and west through Morley Farm, in Shermanbury, called Morleia in the Domesday Book, and that the whole of the land to the north was uncultivated, and comprised the great forest of Anderida, as it was then called. He further found on the Court Rolls of the Manor, and on the survey, evidence that the Bishop, as Lord of the Manor, had a chase in this forest, which extended far to the north, nearly to Crawley, and he had no doubt that all the manors adjacent to this forest also had their sporting rights over the forest generally, and in time, no doubt, verderers and foresters began to reside in various parts of the forest, and so little communities were formed and at last, at Cowfold, a church was built and endowed by the Bishop, and this was the origin of Cowfold. Mr. Freeland further ascertained that the original name of the manor, as it appeared in the Domesday Book, was undoubtedly Hamfelde, but that no doubt it took the name of Streatham from the fact that the Bishop had a country house at Streatham, which has now dwindled to a cottage residence or residences, and that he held his courts there, and so the manor came in time to be called the Manor of Streatham, from the place in which the courts were held.

A similar case had occurred in the Bishop's manor of Westringes, which has been modernised into Wittering. The manor of Wittering is not known by the name of the parish but by that of Cackham, from the Bishop's house, which he built there and which was one of his residences. Cackham Tower is still a prominent landmark, and one of the most beautiful views in Sussex is to be observed from its summit. The Bishop held his court there, and they are held there to this day. Hence the Wittering Manor is now called the manor of Cackham. As regards the neighbouring manor of Shermanbury, this, it appeared, was with other manors given to William de Braiose, said to be modernised into a name "Bruce," who

had his principal residence at Bramber Castle. What became of William de Braiose or his successor he (Mr. Freeland) had been unable to trace, except that his successor in title had quarrelled with King John and "rebelled" against him, after which he seems to have disappeared, and the manor of Shermanbury passed from hand to hand till it came into the possession of the family of the Rev. H. W. Hunt, from whose papers he (Mr. Freeland) had derived some of his information.

It was a peculiarity of this manor that several smaller manors such as the manors of Wantley, Moustow, Oreham and Wall Court were comprised within the bounds of the manor. But these were small holdings, not having any territorial jurisdiction with the exception of the manor of Wall Court, as to which there is a great peculiarity that it had twelve freehold tenants and no copyholders. As the copyholders were aware, the bishop originally held a court leet here for the Hundred of Tipnoak, in which the parishes of Henfield, Woodmancote, part of Shermanbury and Albourne were situated. No one could explain to him the origin of the name Tipnoak, but certainly in the Domesday Book it was called the Hundred of Hamfelde, and so it ought to be called to this day. Mr. Freeland had thus traced the history of the manor with which the Bishop had first of all been endowed by the Saxons. William the Conqueror had left the Church in possession of her property, and consequently the bishops of Chichester had both ecclesiastically and civilly been the lords of the manor from the very earliest times down to recent years, when, in or about the year 1870, the Ecclesiastical Commissioners, of whom the Bishop was one, were allowed to sweep the manor along with the other property of the Bishop into their net. That was the reason why they were assembled under the lordship of the Ecclesiastical Commissioners.

### HADDINGTON PARISH CHURCH.

A MEETING of heritors has been held at Haddington, when a report to the First Commissioner of Works, dated April 11, 1902, signed by Sir Herbert Maxwell, Bart., Sir John Stirling Maxwell, Bart., and Mr. R. Rowand Anderson, LL.D., and sent by the Board of Works in response to an application for the same by the heritors, was submitted re the proposed restoration of Haddington parish church:—

"Sir,—In accordance with your instructions, we have visited the parish church of St. Mary's, Haddington, bearing in mind the proposal submitted to you for obtaining the additional accommodation required for the congregation by restoring and reroofing the transept and treating it as an enlargement of the present church, which occupies the nave. We have carefully read and weighed the correspondence on the subject, both that between yourself and various individuals and that which has appeared on the subject in the public prints. We have also noted the statements set forth in the petition addressed to you by the ministers, kirk session and congregation and of other persons resident in the parish of Haddington, and, having given due consideration to the objections per contra against restoration of ancient buildings in general and of Haddington parish church in particular, we desire to submit the following report. In the first place, we would observe that although the building under consideration is commonly spoken of as Haddington Abbey or the 'Lamp of Lothian,' it is as certain as anything historic can be that the abbey and its church stood upon another site and have entirely disappeared. What we have to deal with is a building of the fifteenth century, which has been used in whole or in part as the parish church continuously from its erection, or at all events since the Reformation until the present day. We consider that this fact considerably modifies the objections entertained against the restoration of buildings which have become ruinous and ceased to be used for the purpose originally intended. Although choir and transept have been disused and become ruinous, the nave has never ceased to fulfil the requirements of the parish church. Mr. Eustace Balfour, whose opinion is entitled to respect, both on account of his professional standing and because he is a native of the county, condemns the proposed enlargement of the parish church as 'trespassing on the ruined portion of the abbey,' and recommends that the money offered by Mr. Christie should be applied to 'the erection of a new supplementary church in another part of the parish.' Such a scheme appears to us very inexpedient. In the first place, it is not at all probable that Mr. Christie would consent to spend his money on such a purpose. At all events, what is before us is his offer to find funds for the restoration of such parts of the church of St. Mary as may give the additional room required for the congregation. In the second place, it is probable that the parishioners, most of whom seem to have signed the petition to yourself, would regret the rupture of ancient association with the church of St. Mary. Lastly, when a parish church has ceased to afford the accommodation required, it is surely most natural and practical to restore it to some part, at least,



of its original dimensions, especially when this can be done without destroying any features of the original structure, for we cannot agree in Mr. Eustace Balfour's opinion that it is impossible to treat the transept as proposed 'without serious injury to its artistic or antiquarian value.' We recommend, therefore, that Mr. Christie's offer be accepted, and that the restoration of the transept be sanctioned according to the plans prepared by Messrs. Hay & Henderson, architects, Edinburgh, subject to the following modifications which we venture to suggest:—The finish proposed by Messrs. Hay & Henderson for the tower is unsatisfactory. There is on the centre of each face of the tower evidence of an intention to complete the central tower with an open crown like St. Giles's, Edinburgh, or King's College Chapel, Aberdeen, but there is no evidence that it was ever carried out. As far as one can make out from the present structure the idea was abandoned. We think the architects should be asked to reconsider the finish they show, and to try the effect of a pyramidal slated roof rising from behind a parapet, or a saddle-back structure, also rising from behind the parapet, as may be seen at the Dundee Church tower, Iona Cathedral, Crichton Church, &c. The former would put less weight on the piers of tower. We would also advise that the open parapets introduced in the early part of the nineteenth century be not reproduced, but that they be kept quite plain, as there is every reason to believe the original ones were, judging from the remains still to be seen, and from examples at other buildings. The tower has gone over to the north-east, but not to an extent to indicate any danger. The base of the north-east pier is crushed, and as the reinstatement of the vaulting will put a small extra weight on the piers, it would be desirable that the architects should carefully examine the foundations and underpin or enclose them with cement concrete as they may deem necessary. We venture to add that we consider it important that a decision should be arrived at and announced promptly, seeing that, as Mr. Christie is an aged gentleman, his handsome and generous offer may not remain long open for acceptance."

The Clerk (Mr. Stirling) read a letter from the law agents of the late Mr. Christie, intimating that it would be about the middle of October before they could state whether Mr. Christie's offer was still open or not.

### YORK MINSTER.

INFORMATION has been given of the progress which has been made in the restoration of the north-west tower at York Minster under the direction of Mr. G. F. Bodley, R.A. The third stage of the work, which is now completed, has been the most expensive owing to a series of elaborate buttress gables, niche-heads and pinnacles. Up to August the carvers had executed 2,058 crockets, 118 birds, 62 grotesques, 61 finials, 87 gargoyles and a number of bosses. No less than 6,608 cubic feet of stone have been used.

The Dean of York (Dr. A. P. Purey-Cust) has issued a report on the work, in the course of which he says:—When the whole of the existing scaffolding is removed the result, I am sure, will be to give encouragement to continue the work on the corresponding tower as soon as possible. The funds entrusted to us are, of course, still available, though the amount is gradually diminishing under the constant and large demands for workmen's wages and for material. We have reason, I think, to feel well satisfied that the large sum of 21,182*l.* 12*s.* 6*d.* should have been collected for the purpose during the heavy demands made on many persons for the South African war, and we cannot but be touched by the munificent bequest of the late Miss Florence Caroline Duncombe. We hope, however, that our many kind friends and well-wishers will continue their liberality until the great work is thoroughly completed.

Indeed the demands upon us seem to be increasing rather than diminishing, and other portions of the building to be requiring immediate attention as well as the west front. We have had to take prompt action with one of the windows in the south nave aisle, the old stonework of which was so rapidly giving way that it has had at once to be removed and replaced with new stonework. And now the condition of the beautiful stained glass in the chapter-house is demanding serious and speedy attention. The surface of the glass seems to have become smitten with little spots or scabs, which gradually spread until the face is entirely consumed and the substance of the plate reduced to the thickness of silver paper. Unless some protection is devised these windows will be speedily blown in and some of the most valuable portions of our art treasures blemished or destroyed. No doubt the expense will be great, and we cannot but hope that not only the general public but those also who have acquired their knowledge as glass painters from studying these windows will help us in this additional call upon our resources, and subscriptions are invited to a special fund for that purpose.

The whole of the glass is crumbling into dust, daylight is

showing through in many places, and quite a large quantity of the glass is as thin as tissue paper and breaks at the slightest touch. In the first place, minute holes are formed which enlarge until they meet and the whole surface becomes eaten away. All the Decorated glass in the cathedral is corroding in the same manner. The chapter-house windows are a little earlier and are in the worst condition, but there is no doubt that unless something is done to protect the outside surface from the atmosphere before very long the nave windows will be in the same condition.

Mr. Bodley, in his report, says:—

It is a matter that really presses, lest a storm should do much damage.

### THE KHAMi RuINS, NEAR BULAWAYO.

A PAPER by Mr. F. P. Mennell, F.G.S., curator of the Rhodesia Museum, was read before the British Association, in which he said that all over the territory between the Zambesi and the Limpopo, now known as Southern Rhodesia, are numerous structures which testify to a former occupation of the country by a race far more advanced in the arts than the Bantu tribes, who are shown by Arab records to have inhabited the country for fully two thousand years. The Khami ruins, situated twelve miles from Bulawayo, may be taken as typical. They consist of about a dozen separate structures showing the usual mortarless walls faced with carefully squared granite blocks about twice as large as an ordinary brick. These walls are about 3 feet thick and rise perpendicularly without any batter as a rule to heights of 10 to 20 feet or more. The exterior walls roughly conform to the shape of the ground available, or are more or less circular, but the interior ones ramify about in a most intricate manner. The principal ruin has three sets of walls at different levels, and as the spaces which they enclose have become filled with debris, they give the hill on which they are built a terraced appearance. The main entrance to this structure has square ends to the walls on either side, and recent excavations have revealed the fact that a series of stone-built steps lead up to it from the foot of the slope. In other cases the walls are rounded off at the entrances and rounded buttresses support them at times. Other devices in the way of decoration are the "chess-board" and "herring-bone" patterns, formed by varying the positions of the facing blocks and the introduction of dark-coloured dolomite blocks to contrast with the granite.

It has been stated that these structures could not have been roofed in, and in only one instance (Impatani) out of many hundreds is a covered entrance known. At Dhllo Dhllo ruins, however, there are the remains of wooden posts let into the masonry, and these have now been found at Khami also. It seems possible that they may have been intended, in some cases, at least, as supports for a roof. That the buildings were intended primarily as forts may be inferred from their inaccessible situations, their narrow and well-commanded entrances, and the fact that the sides of some of the hills on which they are built have evidently been artificially steepened.

Many objects of interest have been discovered at Khami, most of which are now in the Rhodesia Museum, Bulawayo. The pottery and the articles made of copper and iron are probably in nearly all cases the work of later occupants of the ruins than the builders. Discrimination is rendered difficult by the obvious fact that the natives have copied the designs of the earlier workers. This may indicate either that they are the degenerate descendants of the builders of these remarkable structures, or that their ancestors were forced to work for the latter as slaves. The second is in all probability the correct explanation. Peculiar flat oval-shaped stones, sometimes pierced with a hole near one end, are among the articles which may be regarded as ancient, and so are the numerous gold ornaments. The latter include chain and wirework, tacks for fastening beaten gold on to wood, and gold beads of all shapes and sizes and in every stage of manufacture. A few pieces of tin found in one of the smaller structures are of interest, as the metal does not appear to occur anywhere in Rhodesia. They may have been imported. Two classes of objects are conspicuous by their absence here as at all the other ruins. These are inscriptions of any kind, and iron tools such as must have been used in dressing the stone for building. The latter may well have rusted away during the thousands of years which have almost certainly elapsed since they were laid aside, but the absence of the former is not so easy to explain if these structures are the work, as has been contended, of the Sabæan of Arabia.

The Casket which was presented to Lord Roberts at Winchester was designed by Mr. H. W. Lonsdale, of Bedford Row, London. The wood employed was formerly part of a beam in the Norman roof of the cathedral.



## NOTES AND COMMENTS.

FORMAL notice has been served in Cincinnati for the erection of a building fifteen storeys high—*i.e.* about 210 feet—in which concrete and steel will form the walls. The building inspector, who has to authorise the work, appears to have felt his responsibility in approving of the experiment, and an inquiry was held by him on the subject. It was explained that the concrete construction proposed was stronger and more rigid than steel, and will stand the vibrations and strains due to wind pressure better and in a more perfect way. The strength of the structure does not depend on rivetted joints, but on the monolithic character of the concrete, being all one solid mass of stone held together by twisted steel rods and imparting to it an elasticity equivalent to that of a steel building. The architects of the building are Messrs. A. O. ELZNER & GEORGE M. ANDERSON, and the structure will be erected by the Cincinnati Fireproof Company. The building inspector of Philadelphia states that he has had a similar structure under his consideration, and that he had resolved to interpose no obstacle for its erection.

TRICCA, in Thessaly, is among the towns mentioned by HOMER in the catalogue of the ships in the "Iliad." The troops sent to Troy were described as being led by two sons of ÆSCULAPIUS, who were also mighty healers. The Temple of Æsculapius was much venerated. Tricca is now generally known as Trikkala, and excavations near it have produced interesting results. For some time the inhabitants of a neighbouring village have been secretly opening the ground on a hill where the remains of walls suggested a place of importance in ancient days. What they obtained cannot be fully ascertained. But when Dr. KASTRIOTIS, the ephorus, heard of the operations he went to the spot, and after working for two or three days was rewarded with several interesting examples. The most valuable is a bronze statuette of a hoplite, or heavily armed soldier, who bears his helmet, shield and spear. It is in good condition, and is thought to belong to the sixth century B.C. Seven lances, two sword blades, bronze vessels, buckles, nails, &c., were found, besides tiles from the roof of the temple, all marked with the same stamp, and dressed stones from the foundations. It is, however, concluded that the walls which stood on them were of wood. If possible, excavations will be conducted in other parts of the Acropolis. It was near Trikkala that a relief in marble was exhumed which represented ARTEMIS, with attendants and votaries, carrying branches of oak.

THE cantilever principle has been adopted for the viaduct which crosses in one span the valley of the river Viaur in connection with the Orleans railway. It has long been desired to establish railway communication between Carmines and Rodez. They were separated by a valley with abrupt sides. During several years various projects were brought forward, but in 1889 M. THIERRY presented a design by which the deep valley would be crossed by a bridge on the cantilever principle. Much expense was thereby saved in scaffolding. The French Government have liberally contributed towards the expenditure.

THE annual report of the Manchester Society of Architects states that the aggregate membership is 193, viz., ninety-two Fellows, fifty-two Associates and forty-nine students, as against a membership of 182 at the date of the last report, being an increase of eleven. One Fellow has resigned, four members were struck off the roll for nonpayment of subscriptions, five members died, including two past presidents, viz., Mr. R. I. BENNETT and Mr. JAMES STEVENS. Mr. ALFRED DARBYSHIRE has presented a badge to be worn by the president for the time being. The proposal to create a chair of architecture at Owens College has received much and careful consideration from the Council, and during the past year several conferences have been held on the subject. It having come to the knowledge of the Council that the Manchester Corporation were contemplating the erection of the Victoria Baths, in High Street, without first inviting architects in practice to send in competitive

drawings, the following resolution was passed:—"That this Council learns with satisfaction that the suggestion contained in the resolution of the Council, dated February 18, 1901, with regard to the appointment and duties of the city architect has been approved by the City Council; such a decision having been arrived at, it is very desirable that such an important public work as is contemplated in the erection of the Victoria Baths in High Street, involving a large expenditure, should be thrown open either to limited competition or generally to local members of the architectural profession." The students committee say they hope their branch of the Society will be taken up with renewed enthusiasm, and that all the students will endeavour to make the future meetings a success, as there is little doubt that the past ones have helped to bring them more together, and have encouraged that friendly interchange of views and criticism which is so helpful in any work.

THE English company working the quarries at Pentelicus have been fortunate in obtaining an immense block of white marble, which will serve for the podium of the great statue of WAGNER to be erected at Bayreuth. A similar block was raised for the Moltke Memorial. One of the Athenian journals considers it to be a remarkable coincidence, that the material for a memorial of the representative of the latest form of dramatic and musical entertainment should be derived from a place which was dedicated to the ever-young Dionysian BACCHUS, whose festivities originated the drama and opera.

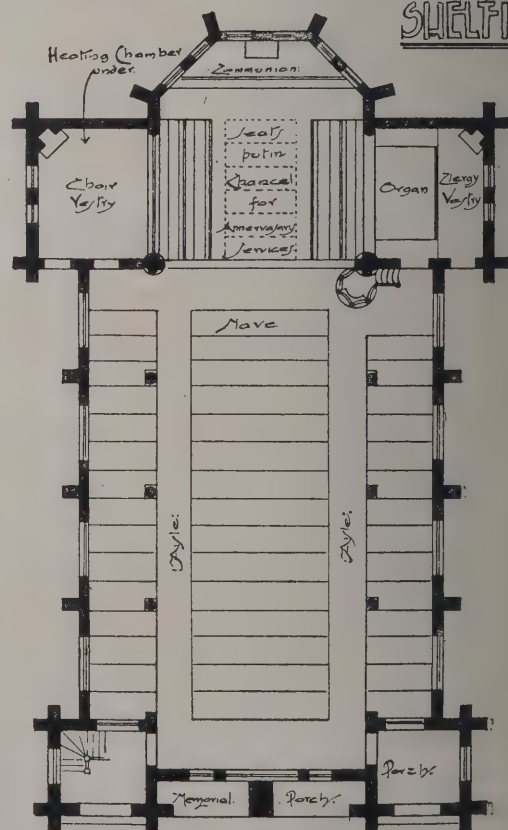
## ILLUSTRATIONS.

FRESHAM HILL, FARNHAM.

CATHEDRAL SERIES—HEREFORD: FROM NORTH CHOIR AISLE, LOOKING SOUTH-EAST.

## PROPOSED WESLEYAN CHURCH—

SHELFIELD



## : ZEPHYR PLAN:

TWO HOUSES AT OLD COLWYN.

FISHERY ESTATE, MAIDENHEAD: VIEW SHOWING PROPOSED DEVELOPMENTS.



## DESIGN FOR VICTORIAN MEMORIAL.

THE drawing is one of a set submitted in the Liverpool Victorian Memorial competition. The base is triangular, that appearing the most suitable form for the site. The materials are fine axed granite columns, &c., polished dark grey; the figures, capitals, &c., bronze. The three principal figures are Charity, Justice and Fame; the small ones Time, Death and Eternity. The band round the plinth would represent the most eminent men of the reign. The plate scales roughly  $\frac{1}{8}$  inch to a foot. The design is by Mr. C. W. JEWITT, Brecknock Studios, N.W.





### MANCHESTER SOCIETY OF ARCHITECTS.

AT the first meeting of the Manchester Society of Architects Mr. Alfred Darbyshire delivered his presidential address for the present session.

In his former address he said he alluded to the establishment of a chair of architecture at the Owens College. He had to chronicle the failure of their efforts to induce the Corporation of the city to join in the establishment of that University chair of architecture, and he also stated that their efforts would not cease till every means at their disposal was exhausted. The paramount question they had to deal with was that of endowment, so as to make the professorship worth the acceptance of a man in whom the profession would have confidence, and whose opinion on all points of artistic value would be sought and respected. It must be admitted that such a tribunal of appeal was required in dealing with artistic matters in such a city as Manchester. They were surrounded with evidences of that want of advice and control; witness the architectural settings of our public statues, and the artistic horrors and heraldic blunders made in the decoration efforts of public buildings (including the civic hall) at a Coronation time or on other occasions of public rejoicing. There were many ways in which the knowledge and culture of a professor of architecture at the University would be of great value, and without in any way conflicting with the official control of the city architect. The Corporation had now joined the movement, and with the assistance of funds promised by gentlemen interested in their art, he felt that they were now approaching a consummation which would add honour and dignity to architecture and its practice. When his term of office closed with the present session he hoped to vacate the chair with the knowledge that the chair of architecture at Owens College was an accomplished fact. After an allusion to the important question of architectural competition and the need for proper and efficient assessment, Mr. Darbyshire said it seemed to him that a fit and proper motto for the present condition of civilisation and movement was the one word, "Speed."

Science moved at such a rate in the application of its principles and discoveries to the needs of humanity and progress that the architect was bewildered, and his greatest energies were needed to keep pace with the hurried onward movement. In the architecture of our cities the architects had, and would have, the hardest tasks to perform in the application of their art to the present and probable conditions of the future. This unseemly speed and competition had engendered a utilitarian spirit, which dominated all city architecture. If a beautiful and refined façade was produced, its lines and its architectural beauties were ruined and destroyed by huge signboards in the form of cut out flaring gilt letters stuck on the elevation, often without the least respect for the lines of architecture, and to the complete destruction of what often was a costly artistic effort. Speaking of science, let them consider what electricity was doing in the way of destruction of city architecture. Hold-fasts for overhead wires were driven into and fixed on architectural façades without the slightest consideration for their artistic value. It was a matter of no consequence as to whether the buildings were public or private, and perhaps no greater instance of the hasty application of scientific requirements to the spoliation of architecture could be found than the present aspect of Albert Square in their city. It was a mass of electrical network. The fine elevations of Waterhouse were completely cut to pieces, and their beautiful lines destroyed. It was said that on the occasion of one of Ruskin's Oxford students returning from Italy he said to the great master, "The moment I entered the Florentine Gallery I knew why you have given to Botticelli such supremacy" (or words to that effect). "Indeed," said Ruskin. "You saw this in an instant. And only to think it took me twenty years to find it out. What will be the end of our civilisation if we go at this speed?" It might reasonably be asked, Could nothing be done to save the destruction of their beautiful art, and to perpetuate and maintain some of the past traditions upon which it had been based since the days of its perfection on the classic plains of Attica? He was convinced that the only reply to this interrogation was, "Let the architects of the present and all future time study the art of the past, whether pagan or Christian; from such study will be evolved the fact that whilst all past architecture was the outcome of certain eras of civilisation under climatic conditions, it never lost sight of the beautiful." A study of their art in the past would also reveal the fact that it was truthful to the requirements of the time. This was an important point and should never be lost sight of; then Christian places of worship would no longer be copies of Grecian temples, factory and workshop buildings would not violate Italian art by the use of its beautiful turrets for chimney-stacks; but the evolution of the art in the future would be truthful to the requirements of the time, and not the result of eccentric efforts at originality or merely reproductions of past examples. A new style on the instant was impossible; it was, and ever would be, the growth and requirement of time.

The modern historian who wrote the chronicle of our own time would have to recognise a topsy-turvydom unknown in the world's history. England, after its past centuries of consolidation in art, literature and intellectuality was now going at the speed which characterised the building up of the new Western world, whereas America was now consolidating in the realms of art, literature and intellectual culture. On this side of the Atlantic we did not hesitate to spoil our art with the hideous application of scientific necessities. There was little respect for existing beauty. We even went to such lengths as painting white marble statues and, he regretted to say it, in their own city, too, although they were recognised as the works of great sculptors of bygone days. Briefly, the architect of this new century had a condition of things to grapple with which would militate against the principles of beauty in architecture, and without beauty architecture became mere building, and only the exponent of science. It was a matter for serious consideration as to how their architects were to face this new condition of English civilisation. The struggle between the commercial and the beautiful would be fierce and its issue doubtful. They could only hope that under whatever new conditions and requirements architects would have to work they would, like the grand old Greeks, still love the beautiful, and so help to maintain through the coming ages the prestige of our great Empire.

On the proposition of Mr. J. B. Gass, seconded by Mr. J. W. Beaumont, a vote of thanks was accorded the President for his paper.

### BRITISH SCHOOL AT ATHENS.

THE annual meeting of the subscribers to the British School at Athens was held on Tuesday in the rooms of the Society of Antiquaries. Dr. Thomas Hodgkin, who presided, congratulated the school on the safe return of Mr. W. Loring, the honorary secretary, from the seat of war.

The report stated that the work of the school had been carried on successfully under the directorship of Mr. Bosanquet during the past session. The first student to arrive in Athens was Miss Lorimer, classical tutor at Somerville College, Oxford, early in October. After some weeks spent in country travel she devoted herself in Athens to a study of the red-figured vases of the latter half of the fifth century in the Central Museum. Another lady student, the Baroness E. Rosenörn-Lehn (University College, London), in the course of a long season at the school (from the beginning of November to the end of June) applied herself mainly to numismatic studies, making a special investigation of the representations of birds in ancient art, especially on coins. The men students were Mr. M. N. Tod, scholar of St. John's College, Oxford ("senior student"); Mr. F. W. Hasluck, scholar of King's College, Cambridge ("school student"); Mr. C. Heaton Comyn ("architectural student"); Mr. A. P. Oppé (late exhibitor of New College, Oxford), and Mr. A. E. Henderson (architect). The committee were happy to report that the design sketched out last year by Sir R. Jebb for the endowment of a studentship for research had been realised by the appointment of Mr. M. N. Tod, the "senior student," for two years. Mr. Tod's special line of study being epigraphy, he spent much time in the Epigraphic Museum at Athens, under the general direction of Dr. Wilhelm, collating and, where necessary, preparing for publication a number of difficult fourth-century inscriptions, which was shortly to appear in the *Journal of Hellenic Studies*. Mr. Hasluck arrived, with Mr. Bosanquet, at the beginning of November, and devoted the winter (1) to attendance at archaeological lectures and the acquisition of the modern language; (2) to a comprehensive study in Athens of the history and antiquities of Cyzicus, in Asia Minor, with a view to an excavation which was to have been undertaken in the spring. The excavation unfortunately was necessarily abandoned, through no fault of Mr. Hasluck, who, however, was able to collect some thirty-five unpublished inscriptions and two pieces of archaic sculpture, one of which (a sixth-century relief of Herakles) was considered of sufficient value to be removed to the Imperial Museum at Constantinople. Mr. Comyn was appointed to an "architectural studentship" in connection with the excavations in Crete. He occupied himself in the neighbourhood of Athens by making a complete set of drawings of the beautiful little Byzantine church at Daou, at the south end of Mount Pentelicus, to which Mr. Bosanquet had invited his attention. Mr. Oppé had worked steadily in the library of the school at the obscure subject of Greek oracles. Mr. Henderson was readmitted as a student for the third time, for the special purpose of the Cyzicus survey. Of the preceding year's students, Mr. J. H. Marshall had been appointed Director-General of the Archaeological Survey of India; Mr. Hopkinson had become a lecturer in Greek at the University of Birmingham; and Mr. Frost a lecturer in the Training College at Isleworth. Mr. Wells had settled down to the practice of his profession as an architect, and Mr. Penoyre



had undertaken a course of archaeological "Extension" lectures. Messrs. Fyfe and Mackenzie, formerly students of the school, had served once more as Mr. Evans's assistants at Knossos. Mr. Edgar, formerly a student of the school, and now on the staff of the Museum, Ghizeh, spent some time in Athens, working both on the catalogue of that Museum and on the report of excavations at Phylakopi. Passing to the work of the director, the committee had to record the preliminary excavation of the early site at Palaio-kastro, on the eastern coast of Crete. The excavation was carried out under the supervision of the director, with the assistance of the "architectural student" appointed for the purpose. The site appeared to have been almost untouched from Mycenaean times until the middle of the last century, and contained abundant remains of houses, large and small, of the Mycenaean period, together with numerous tombs and many hundred vases, both of that and of the earlier ("Kamaraes") epoch. The British Association had made a grant of 50*l.* for the expenses of an expert, who was to make a special study of the well-preserved skulls which had been found. The director had been busy sorting and preparing for publication the last results of the important excavations at Phylakopi in Melos. The finest specimens of pottery from Phylakopi now adorned the Mycenaean room in the Central Museum at Athens; and a number of duplicates had been brought home to England by the courteous permission of the Greek Government, and would be divided between the Ashmolean, Fitzwilliam and (probably) the British Museums. The library had been well maintained at an expense of rather more than 100*l.*, and a fresh catalogue would soon be needed. The directors of other foreign schools in Athens had again, as always, proved themselves valuable friends to the director and students; and thanks were especially due to Drs. Dörpfeld, Richardson and Wilhelm for the welcome accorded to our countrymen at their lectures. Dr. Schrader, second secretary of the German School, and Dr. Svoronos, keeper of the national collection of coins, had also earned their especial thanks. The committee regretted to have to report a deficit of 164*l.* on the year's working. It was earnestly to be hoped that this deficiency might be speedily supplied by fresh subscriptions.

The Chairman congratulated the meeting on the success of the school. In past times the zeal of archaeologists had been somewhat intermittent. Now it was to be hoped that it would be continuous, and that we should not fall behind other nations, and that no Chancellor of the Exchequer would ever lay his hands on the little grant which had been made by the Government. The details known a generation ago of early Greek history were few and uninteresting; Carlyle had bitterly complained of Thirlwall's first volume as nothing but Dolopes, Dolopes, Dolopes. Now happily that was all changed, and the dry bones were made to live, and it might be that the Pelasgians themselves would be brought into clear historic line. It was satisfactory that the British Association was helping, and that the men of science—the anthropologists—were joining hands with a classical society such as this. It would seem that the key to the Pelasgian inscriptions was possessed by the Emperor Claudius; it was, he hoped, reserved for our scholars to rediscover that key. He moved the adoption of the report.

The motion was seconded by Professor Lewis Campbell, who said that his time had been spent rather in the development than in the origin of Greek thought. It was to be hoped that the two lines of study would long continue in co-operation. The motion was unanimously carried.

Mr. Bosanquet, the director, then gave a short account of last year's work, which included the explorations in Crete.

## THE PROPOSED LONDON COUNTY HALL.

At the meeting of the London County Council on Tuesday the special committee on new offices submitted their report recommending the Council to seek Parliamentary powers for the acquisition of a site in the Adelphi for the erection of a new county hall.

Mr. Fletcher moved the reception of the report. He said that the committee had now been considering the matter for 2½ years. The present hall was never considered their permanent home. Taking into consideration the beautiful buildings provided by other public authorities in London, he asked why a body like the London County Council should hesitate in providing a proper and adequate home for itself. The real question was the adequacy of the site. It was central and accessible, and in purchasing it they would get the best value for their money. The amount to be paid was about half the cost of a similar area in Spring Gardens and Cockspur Street. He contended that if the Council was going to build its own home it should be on its own freehold. The site was also capable of extension if necessary.

Mr. Hubbard denied that there was any urgency in the matter. The Council was paying about 20,000*l.* a year in rent for its office. The proposed Adelphi site would cost them

44,000*l.* and there would be another 40,000*l.* a year for the building. He asked where the justification was for the Council to spend 80,000*l.* a year when 20,000*l.* would suffice.

Colonel Rotton complained that the Council had not been fairly treated in this matter. They were driven into a corner and had no opportunity of considering other sites. They had lost the opportunity of acquiring the Westminster Aquarium site, which could have been secured for half the sum now required. They could, too, have obtained it without the necessity of going to Parliament, and in every way it was a more suitable site than the one now proposed. The price of the Adelphi site was far too costly for the advantages to be gained.

Dr. Cooper moved the following amendment:—"That in view of the heavy rates now being levied in all the eastern and southern metropolitan boroughs, it is inadvisable to apply to Parliament for sanction to raise the large sums of money which the adoption of this scheme must necessitate, until Parliament has given to London some new source or sources of income." The proposed scheme would be useless without the widening of the Strand, the cost of which should be added to the scheme. It was altogether a bad site, and he was surprised that anyone should suggest that the Council should spend 1,000,000*l.*, and perhaps 2,000,000*l.*, on a building to be overshadowed by such a hideous monstrosity as Charing Cross station. He could, however, see no reason why they should not provide a modest building on some of the land which they had at their disposal in connection with the Holborn to Strand scheme.

Mr. Piggott said they could hardly expect to provide more ample and convenient accommodation at the same rental they were now paying. There was no country or city in the world that would attempt to carry on its business under the conditions which now obtained in regard to the Council's staff. To make their present offices tenable they had spent over 25,000*l.* No site could be more central than the proposed one at the Adelphi, facing the Embankment. He could not imagine a more suitable site for light, air or accessibility. When they had acquired the site they would find that they already had about three acres of garden under their own control right in front of them.

Lord Welby, the chairman of the finance committee, pointed out that in the year 1904-5, when the first charges under this scheme, if passed, would have to be met, the charges for the Holborn to Strand scheme would have reached their maximum, as well as those for the electrification of the tramways, and there would be a largely increased charge on the rates for the first, whilst the income from the trams would probably almost disappear. In view, therefore, of these facts he urged delay, and declared that it would not be prudent or sound finance, and would be dangerous to real Progressive policy if they hurried on this scheme for a new county hall, which would involve an undue charge on the year 1904-5.

Mr. Elliott thought the Council's present buildings sufficed, and that it was unnecessary for all the staff to be under one roof.

Mr. Burns, M.P., said that owing to the prevarication of the Council many possible sites were passing out of their hands. Were they going to wait until Carnegie came along and gave them a hall for nothing? He hoped not. The truth was the Council urgently needed a good and substantial building. It was impossible for the Council to do its work properly when its fifteen departments were housed in seven different buildings, in some cases a quarter to a half-mile apart. He would not have objected to the Aquarium site. Next to that, the Adelphi was the best site. It was very accessible and central, and would complete the link of national, social and municipal buildings for which the Embankment was so well suited. He did not want an hôtel de ville, but he wanted a solid, dignified building that Londoners could regard as their own, and in which their representatives could properly do their work.

Dr. Longstaff said there was a magnificent site, commanding quietude for committee business, available at an exceedingly reasonable price, and were such an opportunity allowed to pass it might never occur again. The freeholder of a large portion of the site had behaved with great courtesy to the Council.

The Council divided—

For the amendment	29
Against	78
Majority against	—49

On the motion of Colonel Rotton, the debate was adjourned.

A letter has been addressed by Mr. Alfred L. Cohen to his colleagues on the London County Council concerning their proposal to expend 900,000*l.* on the acquisition of Adelphi Terrace as a site and another 1,000,000*l.* on the erection of buildings thereon for a county hall and adjacent offices. The building of a county hall, he says, will take years, and will cost millions, and he proposes an amendment. Is it really essential, he asks, to concentrate every department of the Council on one spot? There may be certain advantages in so doing, but these advantages are counterbalanced by the enormous cost.



Perhaps the most practical solution of the difficulty is for the committee to decide what departments should remain at Spring Gardens and what should go to a less costly quarter, and the committees controlling the various departments could meet in the houses where their officials are at work, and on spots less costly than the Adelphi. Mr. Cohen desires to remind the Council that its present debt amounts to 52,749,682*l.* 11*s.* 5*d.*, and that its capital commitments amounted in March last to 18,207,000*l.*, so giving a total of 70,956,682*l.* 11*s.* 5*d.* Further, is it wise to add to this enormous debt a sum of 900,000*l.* in the acquisition alone of a site on land in a back street, and on which a building eight storeys high is to be erected, which would accommodate only 850 officials, while the present staff is already 897? If, however, the Council should determine to abandon its present building and build a new one, Mr. Cohen points out that, though the cost of the Adelphi site is stated to compare favourably with the other sites which have been considered, it compares unfavourably with at least one site that does not seem to have been considered, but is available and more accessible. If the Council go south of the Thames there is a site available east of Westminster Bridge, between the Westminster Bridge Road and the works dépôt, which, in the opinion of the valuer, could be purchased, including compensation, for 650,000*l.*, and contains an area of 4.1 acres. By the expenditure of about 21,000*l.* in the construction of an embankment wall in line with the embankment of St. Thomas's Hospital, and the payment of a fine of 10,000*l.* to the Thames Conservancy, the foreshore could be reclaimed and thereby an addition of 1.3 acres secured, so that a total area of 5.4 acres could be secured for 681,000*l.*, the Adelphi site, 3.35 acres, costing more money and giving less accommodation. Mr. Cohen urges the consideration of the South London site on grounds of economy, of beauty, and of great convenience of access.

#### ARCHITECTURAL ASSOCIATION OF IRELAND.

THE first general sessional meeting of the Irish Association was held on the 7th inst. in Dublin. Mr. F. G. Hicks, president, occupied the chair.

The annual report was read by Mr. Beckett, one of the hon. secretaries, and briefly recounted the work of last session and the various lectures delivered by prominent members of the profession. The report recorded regretfully that the attendance at the classes last year was not all that could have been desired. In membership and finance the Association was in a flourishing condition.

Mr. Holloway moved the adoption of the report.

Mr. Allberry, in seconding the motion, suggested that another secretary should be appointed to take charge of the reports for the technical and daily papers. He also thought it would be a good thing to try and get the Irish Institute of Architects to hold examinations. They could then draft a syllabus which pupils would be ready to take up in order to be examined in Ireland on Irish lines.

The report was adopted.

Prizes won during the past session were then distributed, the following being the successful competitors:—

Architects' Institute Prize—Mr. John Knox Vinycomb.

The Doolin Prize—Mr. John Knox Vinycomb.

The Beckett Prize—Mr. F. H. Tallan.

First Prize, Class of Design—Mr. F. H. Tallan.

Second Prize, Class of Design—Mr. G. Hamilton Barlee.

The President then delivered his inaugural address, which contained many valuable suggestions for the improvement of the Association. In the course of his remarks, which were frequently applauded, the President said he was not going to bring forward any very new or startling ideas. He proposed to talk of themselves and address his remarks chiefly to the younger members of the Association. The education of students in the past had been practically nil, and even now it was of a more or less haphazard and imperfect description, and the chief object of the Association was to promote and afford facilities for the study of architecture, which was a very comprehensive word. It took the London Association fifty years to discover that their educational system was not all that could be desired, and a revolution resulted in their present apparently complete and up-to-date system. They should profit by that experience and look for defects as they went along and supply the necessary improvements if possible. They had difficulties here to contend with of which they knew nothing in London. Their little roll of 131 members, compared with that of London of 1,400 seemed ridiculously small, and any falling off in classes or meetings was at once apparent. From their very scarcity of members it behoved each one to do his utmost to make their teaching a credit to Dublin in particular and Ireland in general. One of the chief defects of their system, so far as he could see, was that it was practically aimless. They commenced each session with exactly the same kind of subjects, advanced a certain distance and then stopped. All this to his mind was wrong. A

student, perhaps serving his four years' articles, could not possibly learn all there was to know about a subject in one session, and yet they could not expect him, however necessary it might be, to go over the same ground year after year. He thought if they were to be of any real benefit as an educational body they should formulate a proper curriculum of study, spreading over two or three sessions, commencing with elementary subjects and concluding with those more advanced, and at the end let there be a test as to what the man had learned. They could hardly grant diplomas, but something in the nature of a certificate might be given as evidence of the course of study gone through and progress made. A great want to students was a pamphlet setting forth the qualifications they should possess and the subjects it was absolutely necessary to take up. It seemed to him that the Institute should be up and doing—should they not insist on candidates seeking admission presenting themselves for examination? That would be one of the surest ways of guarding the interests of the profession, and that he believed was the principal object of the Institute. Their glorious profession involved life-long study, and they should follow the old masters, and strive after the poetry and imagination which inspired them. Their city of Dublin, with its many fine monuments and lovely natural surroundings, full of tradition, should be and could be one of the most beautiful cities of the world. They should do their best to make it so. One looked with sorrow at the ravages caused by the jerry-builder, and he regretted to say there were jerry-architects quite as much to blame, and asked, need these things be? With regard to their teaching arrangements for the present session, single responsible lecturers had been appointed who would conduct the course in place of the group of instructors as heretofore. That was only a small beginning of a scheme which they hoped would be eventually more or less perfected. Another necessary addition was a studio, where students both young and old could meet at all times, do a little modelling or perspective and interchange ideas. A studio, however, would hardly be possible until they got premises of their own, and the sooner they faced the problem the better. Mr. Hicks also drew attention to the necessity of accurate drawing and draughtsmanship, and laid special stress on the value of sketching to the architect. They should go to nature for inspiration, and she would never fail them. Above all, enthusiasm was requisite—burning, infectious enthusiasm—which would carry them through all kinds of trouble to ultimate success.

Mr. C. J. MacCarthy, in moving a vote of thanks to the President for his address, congratulated the Association on having such an eloquent and practical gentleman in the chair. He might also take the opportunity of congratulating Mr. Hicks himself on a recent event. Lord Iveagh, with great generosity, was about to erect a market in Dublin, which he is to build entirely at his own expense and hand over to the citizens. He invited designs from all architects resident in Ireland. Eight only responded to that invitation, but still including some of the most distinguished Irish architects, and as a result of that competition the prize was awarded to Mr. Hicks. He (Mr. MacCarthy) believed with the President that architectural education in Dublin was sadly neglected, and that the younger members of their profession were not taught in the way they should be. Something must be done in the immediate future for the improvement of architectural education.

Mr. G. P. Sheridan seconded the motion, which was passed with acclamation.

The President having briefly acknowledged the compliment, the meeting concluded.

#### PHOTOGRAPHS AS EVIDENCE IN COMPENSATION CASES.

ON Tuesday Mr. Under-Sheriff Burchell and a special jury, at Red Lion Square, Holborn, heard the case of Matthews v. the Great Northern and City Railway Company, a claim for compensation in respect of structural injury alleged to have been caused to the leasehold premises Nos. 110 and 126 New North Road, by subsidence due to the construction of the new "tube" railway from Finsbury Park to the City. The claimant stated that from the end of the year 1900 until recently various structural defects had developed. The wife of a tenant stated that the creaking and cracking noises at night were such that she thought the house was haunted. Mr. Houchin, an architect, and other witnesses expressed the opinion that in addition to being recouped for the outlay on repairs, the claimant ought to receive compensation for the probable diminution of the market value of the leases. On behalf of the company, counsel contended that the method by which the "tubes" are constructed, by means of the "Great-head shield," precluded the possibility of any movement or subsidence of the soil through which they are driven; and that the houses in question were sixty or seventy years old and rested on



very shallow foundations. Mr. Douglas Young (vice-president of the Auctioneers' Institute) stated that before the commencement of operations the promoters took the precaution to photograph the houses and other buildings along the route, and that the photograph of one of the houses in question revealed an extensive crack which was in existence long before the line was made. Mr. Daniel Watney stated that the condition of the houses was such as he would expect to find, having regard to their age and the class of building. Mr. E. A. Gruning and Mr. Howard Chatfield Clarke, architects, Mr. Leslie R. Vigers, surveyor, and Mr. Johnston, engineer to Messrs. Pearson, the contractors for the line, also gave evidence. The Under-Sheriff, in summing up, said that if the jury came to the conclusion that the photograph which had been produced was accurate it must materially reduce their award, assuming they found that any damage was done by the "tube" railway. The jury found as follows:—"The verdict is unanimous for the defendant company that damage has not been done by the construction of the 'tube,' but that it is the work of time."

### THE HAWARDEN GLADSTONE MEMORIAL.

**S**T. DEINIOL'S Library, Hawarden, which has been erected as a national memorial to Mr. Gladstone at the cost of 10,000*l.*, was opened by Earl Spencer on Tuesday. It has been placed on the brow of the hill at Hawarden, and commands a view over the estuary of the Dee. The foundation-stone, laid by the late Duke of Westminster, bears the following inscription:—"In this building, erected to his memory by a grateful nation, is preserved the library of William Ewart Gladstone, who, eminent no less as theologian than as statesman, established this foundation for the advancement of Divine learning. This stone was laid in the presence of the Lord Bishop of the Diocese by the Duke of Westminster., K.G., October 1899. G. E. Joyce, warden." Externally the building is faced with Helsby stone, a red sandstone, and the roof is covered with dark-green Buttermere slates. Designed in the Gothic style, with mullioned windows, the building at once expresses the purpose for which it is destined. The interior consists of two large rooms, one for divinity and the other humanity, with galleries round and open-timbered roofs of oak. There are, besides, studies and rooms for the wardens. The floors are laid with oak blocks, and the columns and gallery front are enriched with carving and tracery-work, which add greatly to the effect of the large rooms. The oak bookcase fittings are of simple character on the lines of those devised by Mr. Gladstone, and his method of placing them to economise space has been largely followed. To the right of the library, attached to it, will come the hostel and warden's residence, when the necessary funds to build are forthcoming. Messrs. Douglas & Minshull, of Chester, were the architects. Mr. Gladstone had stored his great collection of books in a temporary stone building close to, and on the removal of the volumes a few weeks ago great care was taken to transfer them to the shelves of the new building in the same order. Some time ago the volumes available for students, who are required to belong to no particular sect or nationality, numbered nearly 35,000, but as an endowment has been left with the library, the number is gradually increasing.

### THE LONDON TOPOGRAPHICAL SOCIETY.

**O**N Wednesday the annual meeting of the London Topographical Society was held, the Earl of Rosebery, president, in the chair.

Lord Rosebery, in the course of his speech, said:—"There must be thousands and thousands of opulent people in London with much leisure, of whom London is the home, though they may make holiday excursions from it, who should be interested in the past history of this great capital, who should not be content merely to become members of this Society and receive the results of the work of others, but should also take part in that work themselves. For my part, the indifference of the public to our proceedings—I do not altogether blame it, because we do not advertise ourselves, and success without advertisement in these days is hopeless of achievement—is almost an inexplicable symptom."

For, after all, London is changing before our eyes. It has been changing during the last quarter of a century with inconceivable rapidity, but that rapidity has been almost duplicated and triplicated since the advent of the London County Council. What ancient streets it is going to cut through in that great new avenue for which it cannot find a name; what are to be the demolitions entailed by that anonymous crescent, which all the sagacity of our municipal legislators has failed to christen? I do not dare to reckon, but I do not doubt that among my three colleagues in the chairmanship of the London County Council there must be a guilty feeling that at this moment the march of

utility is going to stamp out some venerable dwellings, some ancient associations, which dwellers in London would gladly have spared if that were possible. But as these destructions are inevitable, and must go on with the development of London, surely the least we can do is to preserve for our descendants the exact picture of what was, and what has ceased to exist, both in the shape of maps of streets that were, and also of representations of ancient and interesting buildings which have been destroyed. I do not profess to be an expert like Mr. Wheatley or Mr. Gomme, but I never examine a print of an old house, such as Bedford House, in Bloomsbury Square, which has so many political associations, or any sketch of the old palace at Whitehall, which has almost entirely disappeared—the ground plan of which the Society has produced—I never come across any trivial prints of that kind without feeling a desire that they should be preserved, and so give this Victorian and Edwardian London which we inhabit some flavour or aroma of the historical London of the past, without some knowledge of which, after all, so much of our political history is unintelligible. If we are to do this, as I think it ought to be done, and as it is not in the least likely that any public body, borough council or other, will spend the rates in doing so, it is necessary that some small nucleus should be formed of people who are earnest in this matter, and who wish to preserve for the instruction of future generations some picture of the fast vanishing London as it is. That is the function which we present to ourselves in the first place. But we also have in view the reproduction of rare maps, of some of which, as Mr. Gomme has told you, only one or two copies exist; and, therefore, in the interest of their preservation it is most desirable that copies should be made by some association or other. Even if no member of our society wish to preserve in his house copies of these maps, yet, in the interests of the general public, it is most desirable that they should be multiplied, so that in case of accident or fire the maps may not altogether disappear. I think that is a public-spirited work which deserves the encouragement of the people at large.

But from another point of view our work has been very imperfectly developed. We have but one meagre, and I suppose what Milton would have called scrannelled, volume of our annals. What we should aim at is very much what Mr. Gomme indicated—the culling from various volumes, such as the publications of the Master of the Rolls, those passages which have reference to London and which only extreme and diligent exploration would enable the student to find for himself. There ought to be a London library—I do not mean the estimable institution in St. James's Square—but a library of London books such as have been published by other societies—by the Surtees Society, for example, with regard to the north—a library of books relating to London, reprints of scarce volumes, excerpts from massive volumes which do not altogether relate to London, documents bearing upon London—a whole collection which would be invaluable to the future and present student, and which only such a Society as ours could bring into being. I regret the death of Sir Walter Besant, who would have taken such an ardent interest in the efforts of our Society and would have popularised it so much; but, in his absence, if with very feeble halting accents, we can summon, we can call, I think, the people of London to remember their duty in regard to this particular and to give their support ungrudgingly to the public-spirited efforts of this Society. I am convinced that, when once it is known, it will receive that support, and I hope it will be given in no grudging or reticent spirit, but that before the next meeting of the Society we shall be unable to meet in this generously afforded room from want of accommodation for our members. To my mind it has been the great spiritual function of the London County Council, as apart from its material efforts, which have been open to criticism and question by its enemies—it has been the great spiritual function of the London County Council, which no one has questioned or criticised, to make us feel the unity, the splendour and the historical association of London as a whole. In our humble way, though we have not the power and the dignity of the London County Council, we may do much to advance that work. It is for that reason I am proud to accept the offer you have made me, and to remain—in- efficient as I am, and as I admit I am—in this capacity—President of the London Topographical Society.

**A Plumber** named Coaker was summoned by the Islington Borough Council this week for having improperly set a soil-pipe. The evidence showed that the defendant had run molten lead into the joints where it was easily observable, but at the back of the pipe the joints were stuffed with rags and paper. The defendant said that he was assaulted on the work and was unable to supervise the men. The magistrate said it was monstrous, and fined the defendant 40*s.*, with a penalty of 20*s.* per day for fourteen days—16*l.* in all—with the alternative of a month's imprisonment.



**TESSERÆ.****"Hearthstone."**

IN London the demand for stone has at all times been considerable. During the long period that the chief supplies for highly decorated buildings were imported from Normandy various circumstances must have occurred to delay the arrival of cargoes. Political disputes between the two countries most probably occasioned the importation of Caen stone to be altogether prohibited. At such intervals the rocks nearest to the Metropolis would necessarily be made available, and accordingly in almost all old buildings we find occasionally introduced large portions of stone from the vicinity of Reigate and Godstone, known by the various names of Reigate stone, Gatton stone, Merstham stone, firestone and more commonly as hearthstone. This material must always have been expensive in London, on account of the distance to fetch it, being twenty miles land carriage. It may be very expeditiously worked; nevertheless it ought not to be used for external purposes, for it would be difficult to meet with an instance where it has been exposed to the atmosphere for twenty or thirty years without the surface having mouldered away in small flakes, so as ultimately to obliterate all architectural details. The greater part of Westminster Abbey was formerly built with stone brought from quarries at Godstone, from which circumstance that village is said to have derived its name. Sir Christopher Wren, in alluding to the repairs of the Abbey, describes the stonework as having mouldered away 4 inches deep from the original surface. He repaired the parts most decayed with stone "brought down the river from near Burford, in Oxfordshire." A specimen of this reparation may be seen on the exterior of the north transept and on the north side of the choir, as far as Henry VII.'s Chapel. Reigate stone was not entirely out of use in the time of James I., for Inigo Jones introduced it in part of the front of Whitehall. The festoons of fruit, &c., on a line with the capitals of the upper columns were originally carved in this stone, and so much decomposed before the repairs in 1826 that they were taken down, and new ones, executed in Portland stone, were substituted. While both Caen and Reigate stones were in general use for ornamental architecture, large quantities of hard grey limestone, generally known by the name of Kentish rag, were brought to London by water from the neighbourhood of Maidstone, and extensively used for ruder purposes. The basement, or plinth next the ground of Henry VII.'s Chapel at Westminster is formed of this stone, and large masses of wall of the same material were found in digging the foundations for the Houses of Parliament. About this time, or soon after the year 1600, Portland became the general stone used for superior buildings in London and the south of England.

**Roman Remains.**

The position of Roman remains in England and on the Continent is wholly different. Among the nations of the Romance speech, Roman remains are not only far more abundant and in far better preservation than they are here; they occupy a wholly different historical position. No doubt there are wide differences in different parts even of what is now France. The nearer we draw to the imperial centre itself the more numerous are the Roman buildings and the greater the influence which they have had on the style of later buildings. A perceptible difference in this respect may be felt between Normandy and England, between Aquitaine and Normandy, between Provence and Aquitaine. And of these the gap which separates England and Normandy would seem to be the narrowest of all. The reason is plain; the Norman settlement in Neustria was much more like the English settlement in Britain than it was like the Frankish and Gothic conquests elsewhere. The Scandinavian settlers retained the sites of the Roman cities and gradually learned the Romance language; still the continuity between Roman and later times is much feebler in Normandy than it is in other parts of Gaul. Normandy, in this, as in many other respects, presents a state of things intermediate between the phenomena of the Continent and those of our island. Setting therefore that transitional district aside, we find the position of Roman remains and their historical value altogether different in England and on the Continent. In France and much more in Provence and Italy, the connection with Roman times is continuous. It goes on in language, in nomenclature, in art, in institutions, in everything. No impassable gulf separates the present from the Roman past, the change has been great but it has been perfectly gradual. We suspect that the great French Revolution, which no living men can remember, was really a ruder snapping of ties between past and present than any Gothic or even Frankish conquest. The actual Roman remains are constantly found standing above ground; sometimes Roman buildings remain in so perfect a state that they can be applied to some modern use. In England, Roman remains standing above ground are rare and fragmentary, except in the case, which is only another illustration of the same general law, of

places like Pevensey and Burgh, where the Roman walls of a forsaken city remain perfect, or nearly so. There is no Roman building in England which can be applied to any modern use; indeed the great mass of our Roman antiquities consist not of buildings at all, but of inscriptions and objects of various kinds, themselves for the most part quite fragmentary, dug out of the earth in Roman sites.

**Harmony in Architecture.**

There is harmony in the plan of an edifice when the whole appears to be the result of one mind; when all the distributions, each according to its respective use, co-operate in one general purpose; when each part, in connection with its use, seems to be only the effect of the necessity dictated by the pleasure of producing symmetry; and when, in short, by means of clear and simple lines, easily to be understood, art has united, in a manner both varied and uniform, the subordinate parts of the projected undertaking in such a way that nothing appears to have been forced into difficult combinations, but that everything is the result of necessity, and could not have been otherwise than it is. The harmony of the plan ought to become the principle and basis of the general elevation; although in some instances an exception may be made to this rule, as far as certain palace fronts are concerned, which have no connection with a general whole. Harmony of elevation consists primarily in the correct proportions of the length, breadth, height and depth, which the eye in viewing a building seizes upon readily. This sort of harmony between the principal dimensions constitutes a part of the system of proportion, of which the works of nature and the conformation of the human frame afford examples up to a certain point. No precise rule, however, can be laid down concerning this, as circumstances, depending upon locality, prospect and position, ought to be taken into consideration by the architect, which cannot be reduced to general principles. The most important principle of harmony which requires to be observed in elevations is that which so disposes of the masses (the peculiar arrangement of which must depend on the general style of the building) as to point out clearly the exact destination of each, and at the same time to preserve the degree of unity between them which is necessary to make them seem parts of one whole. But this quality is unfortunately one of the rarest that we meet with when we examine the construction of existing edifices. Harmony in decoration, both in theory and practice, is perhaps easier to understand and to observe. Each order shows us, by its proportions and by the affinities that are established between its form and its ornaments, the rule and pattern of true decorative harmony. Light or delicate ornaments, as may be easily perceived, would ill suit an order expressive of strength and solidity, and *vice versa*. An enlightened feeling in the inventors of the orders led them to proportion to the degree of strength expressed by each the lightness or richness of the ornaments to be employed. We thus find those columns which, from the proportion of their breadth to their height, must necessarily be the strongest the least laden with ornament; and the consequence of this is that, if an order suitable to the object in view has been fixed on and its proper decorations are observed, harmony between the use and appearance of the building will be the result.

**Style in Art and Literature.**

There is a considerable difference between what we imply by the abstract term "style" in art and the meaning of the same word as applied to literature. It is incomparably more important in the former case than in the latter, and for this reason—that in art the means of signifying a thing is the actual representation, image or partial realisation of it, whereas in literature or speech it is a mere conventional symbol, having no intrinsic resemblance whatever to the thing signified. The word "man," for instance, is nothing beyond three letters and a sound; but the picture man is a real man in form and colour. Or we might make the practice of picture-writing serve as our illustration. The excellence of literary style in picture-writing would consist simply in clearness and conciseness, but the excellence of artistic style (supposing it to be aimed at here as in an ordinary picture) would present a real and fine image of the thing itself. Now the difference between the most slovenly and diffuse and the most emphatic and concise style of picture-writing, as read off into words would be extremely small compared with the difference between the meanest and the finest pictured form, considered as real representations. The worst distinctive picture word for King Sesostris would still read "King Sesostris" very nearly as well as the best; but fancy the difference between the worst distinctive and the highest characteristic or ideal portraiture of King Sesostris as a work of art. This of course is an extreme illustration of our position, but it is not a false one. Of course, too, style is important in literature, but it is not so important, nor does the term there in its widest acceptation imply nearly so much as in the narrowest it does in art. For in art you cannot have a fine, a noble, a bold or a timid style without having therein a



fine, noble, bold or timid representation or actual image of the thing signified. In fact, style in art may be said to include everything beyond the choice and conception of the subject itself, and the mere accuracy or otherwise of its embodiment. It is thus a third of the whole battle, being, in one word, the artist's embodied perceptive (as distinct from his conceptive) faculty, and no school can be great in style without being *ipso facto* great in art. That Michel Angelo chose noble subjects and conceived or thought them out greatly, was not a matter of style, nor yet that he drew or coloured them accurately, when he did so, but that he represented them nobly was a matter of style. The term includes all the rest of his performance in art. In like manner, the whole difference between the early Italian, the French and the British schools is difference in subject and conception, in accuracy and in style. If a Frenchman and an Englishman both choose one domestic subject and both paint it accurately, one might at first blush assume that the two pictures would be greatly alike; but they would not prove so, the styles would be sure to be extremely diverse. It will be observed that we are not here speaking of the minor differences of style, or what is more properly termed "manner" between artist and artist, but of the dominant way of looking at things and of expressing them—of style as a many-phased but permanent element in all art.

### Chinese Cities.

There is scarcely any difference between the greatest part of the cities of China, they are all nearly alike, so that seeing one is sufficient to give an idea of all the rest. They are for the most part square when the situation admits of it, and surrounded with high walls, with towers built against them at proper distances. They have sometimes ditches, either dry or full of water. The gates of the cities, though they are not adorned with figures in bas-reliefs like other public works, surprise very much by the prodigious height of the two pavilions that form them; by their vaults or arches that in some places are of marble; by their thickness and by the strength of the work. Triumphal arches in the streets, tolerably handsome temples consecrated to idols, or monuments erected to the memory of the heroes, and of those who have done some important service to the state and for the public good; in short, many public structures are more remarkable for their vast extent than for their magnificence. Add to this some pretty large squares, long streets, some very wide, others but narrow, the houses on each side having only a ground floor or one storey higher. There are shops adorned with Chinese ware, silks and japanned goods. Before the door of every shop there is placed a pedestal; upon this is fixed a board 7 or 8 feet high, either painted or gilt, on which board are written three large characters, which the tradesman chooses for the sign of his shop.

### The Vocation to Art.

In the arts the most flattering indications of talent are often found to be fallacious; gleams of ability frequently brighten the first years of study, which afterwards prove to have been false lights, tending only to render the subsequent darkness more conspicuous. There is a kind of superficial ingenuity, well calculated to take the lead in drawing-schools and academies, which, assuming all the airs of genius, often passes for that quality amongst inaccurate observers; but this glittering tinsel kind of talent rarely attains to eminence, it belongs more to the hand than the head, and most commonly ends in a manufacture of mannered insipidity and unfeeling mechanism. But if it be thus difficult for the student to estimate with accuracy the extent of his abilities for the fine arts, it is doubly incumbent on him at least to ascertain the strength of his attachment to them; let him beware lest, as the text observes, "he transient liking take for lasting love;" lest his disposition to painting should prove but the fickle avidity of a child, who this moment seizes his plaything with rapture, and the next throws it from him with disgust. Enthusiasm, though not always a sign of genius, is always essential to excellence; nothing great or elevated in poetry or painting was ever produced without it; it is the only quality which can enable the mind to surmount the obstructions of difficulty and support the pressure of disappointment. A strong love for the art is always good security for a steady application to it; and without steady unremitting application the best opportunities are lost and the best abilities unavailing. The young votary of art should therefore look into his own mind with attention and examine its dispositions; he should contemplate the profession he is about to adopt not only in its pleasures but in its pains, in its defeats as well as its successes. Let him reflect that what has hitherto captivated him as the amusement of his life, leisure must now become the serious occupation of his life, losing (like all serious occupations) much of its agreeable character in the obligation by which he is bound to it, demanding an attention undivided, a patience inexhaustible, and a perseverance steady and energetic under every change of

humours, seasons and situations. If on this candid examination he finds not in his breast a passion for the art that rises superior to remonstrance, that cannot calculate consequences or compromise with prudence; if he can balance advantages, if he can doubt or hesitate, let him be assured that his call is not genuine; let him lay aside his pencil, and forbear to toil in a pursuit for which he wants the most essential qualification, which can tend only to unfit him for common enjoyments, and expose him to all the misery of disappointed hopes and mortified pretensions.

### Primary Colours.

The "colours of light" are as much under the dominion of science as the varieties of sound. Taste and genius may possibly do everything in art in ignorance of scientific principle, but such principle exists, nevertheless, and cannot be appealed from. There is a very beautiful optical experiment, probably not generally known in art—a knowledge of it will not make a colourist, though every colourist ought to know it. Place the three primary colours, red, yellow and blue in their relative proportions, around a circle (as in the experiment for producing a white light from them, by a rapid rotatory motion), mix up from these three colours, taking only two contiguous ones at each time, the principals of a secondary circle, or the second principals of the first circle, and you will obtain at intermediate points the less pure colours of orange, green and purple. Between each of these six colours introduce farther intermixtures. Let them stand thus:—Red, orange red, red orange, orange, yellow orange, orange yellow, yellow, and so on with the whole circle. This may be called the primary circle, and exhibits the richest and most brilliant colours in nature. Then take the secondary colours out of this primary circle and place them as primary colours in a secondary circle—take out the orange, green and purple, and by mixing two of each as before, a third set of principals will result—olive, slate and brown—for orange and green with the prismatic rays makes an olive colour—purple and green, a slate colour—and purple and orange, a brown colour. Intermix them as before and you have a second circle of eighteen colours. Take from this secondary circle its secondary colours—olive, brown and slate, and by the same process form a third circle of eighteen colours still more corrupted, and the three circles will probably be found to comprise almost every tint that is reflected to the eye from natural objects. It may be also added that in each circle every colour, whether primary or corrupted, is to be found diametrically opposed to its contrast or complementary colour, and with that contrast, however corrupted each may be, even of the third circle, will reflect the white solar beam when subjected to a rotatory motion. The Italian painters revelled in the primary circle, for their more brilliant sun developed the local colours of objects more effectually. They painted in a higher key and luxuriated in the more vivid and uncorrupted beams of coloured light. The Dutch and Flemish painters, from the obstruction of the sun's rays, occasioned by their humid atmosphere, were accustomed to more corrupted colours, and with them, as with us in England, the primary colours are called gaudy, "while sentiment delights in drab." Earth and sky, water and land, usually display the same dull monotonous garb; even the streets, the human beings who walk them, and the houses which the latter inhabit, rejoice in the same melancholy absence of coloured light during the greater part of the year.



### Sulgrave Manor.

SIR,—Absence from town has delayed attention to the reports, which, I find, have been so industriously circulated during the past few weeks, to the effect that the management of the Universal Exposition, St. Louis, 1904, have made overtures to owners or agents for the purchase and removal of the house known as Sulgrave Manor, the ancestral home, in Northamptonshire, of one branch of the Washington family. I therefore bespeak space in your columns to say that no such thing has been so much as thought of or suggested, much less seriously considered. Perhaps I may be permitted to assure the public that the exposition authorities do not contemplate the transfer, from England or any other country, of buildings or monuments which have become interesting, either by lapse of time or by association with men and events.

Even if the management were inclined thus to proceed with the Sulgrave Manor House, they would, I fear, scarcely have time before the close of the exposition to enter upon the prolonged discussions and contentions, or to decide the



disputes and doubts apparently inevitable when the Washington genealogy is involved. If they should muster courage to enter upon such a course, they might face the necessity from time to time for adding another building to their list. As Pope's interrogatory line suggests that there is a tendency among doctors to disagree, so the student, with an interest however slight in heraldry, is forced to conclude that the same conditions are not wholly wanting in the genealogists who, drawn from all quarters of the globe, deal with the origin and history of the English Washingtons—I am, Sir, very truly yours,

GEORGE F. PARKER,

Commissioner in the United Kingdom of  
the Universal Exposition.

Sanctuary House, Tothill Street, S.W.: Oct. 11.

### GENERAL.

**The Liverpool Cathedral Committee** have decided to confine the final competition to the five architects selected by the advisory architects. They are Messrs. Austin & Paley, Lancaster; Mr. C. A. Nicholson, New Square, London; Mr. G. Gilbert Scott, York Mansions, London; Mr. Malcom Stark, Little College Street, London; and Mr. W. J. Tapper, Raymond Buildings, London.

**The Statue of General Gordon**, which was lately exhibited near Trafalgar Square, has been rescued uninjured from the Thames. The report of the marine surveyor of the Salvage Association is as follows:—"Skeleton case, containing a statue of General Gordon on camel, in bronze. This package has been under water, and much mud was deposited on the statue. The mud has been washed off as far as possible by the use of the ship's hose. The case is not broken or otherwise injured. We recommend in the interest of all concerned that it be forwarded to destination."

**Mr. H. Syer Cuming**, a vice-president of the British Archaeological Association, died on Tuesday in last week, in his eighty-sixth year. Mr. Cuming was widely known among antiquaries, his museum of interesting and valuable natural and artificial rarities, of which his father, the late Richard Cuming, laid the foundation in 1782, being among the best privately owned collections of the kind. The museum, with 8,000*l.* for its maintenance, has been bequeathed to the Walworth Road Public Library.

**A Statue of the late W. E. Gladstone**, by Mr. Thornycroft, R.A., was unveiled in George Square, Glasgow, by Lord Rosebery. The statesman is represented in his robes as Lord Rector of the University.

**A Special Committee** of the Newcastle Town Council have recommended the erection of three large blocks of dwellings in different neighbourhoods to be let in single and pair-room tenements. The scheme will give accommodation for 1,200 people at a charge of 2*s.* per room per week.

**The Parish Church of St. John's, Hoxton**, which has been closed for restoration and decoration during the past three months, was reopened on Tuesday. The walls and galleries are of a terra-cotta colour relieved with gold, while the ceiling has a blue background, and is divided into compartments containing pictures of angels and other figures described in the Book of Revelation. The church is lighted by electric light. The decoration has been carried out by Messrs. Campbell Smith & Co. at a cost of 4,000*l.* under the supervision of Mr. Reeves, architect.

**At a County Meeting** at Northampton to further a movement for erecting a public memorial to Northamptonshire men who were killed in action, or who died from wounds or disease in the war, it was resolved to fill the great west window of Peterborough Cathedral with coloured glass as a memorial, and the erection of a tablet containing the names of all the county soldiers and sailors who fell in the war. The window will be designed by Mr. G. F. Bodley, R.A., and the cost of the memorial will be about 1,200*l.*, half of which has been subscribed. It is proposed to erect an additional memorial in Northampton town hall to the Northampton men who fell in the war.

**The Mayor of Margate** last Friday performed the ceremony of cutting the first sod in connection with the new water-supply for Margate at the source, Wingham. Over 12 miles of main will be laid, and an expenditure of about 100,000*l.* will be required.

**A Girder** weighing 8 tons was being hoisted by a crane at the new War Office buildings in Whitehall on Tuesday, when the wire cable broke and the girder crashed through a series of platforms, carrying everything before it. No one was hurt.

**A Marriage** has been arranged and will take place in January, between Mr. R. A. Briggs, F.R.I.B.A., of 32 Holland Park Avenue and 12 Norfolk Street, Strand, son of the late Mr. Henry Briggs, of Shorefield, Prittlewell, Essex, and Mysie, daughter of the late Mr. E. Fox White, of 57 Lexham Gardens, South Kensington, and Thursley Hall, Haslemere, Hants.

**M. Rouville**, who was one of the engineers-in-chief to the "ponts et chaussées" of France, has presented to the State 60,000 francs for the purpose of founding a quinquennial prize of about 10,000 francs for the engineers of "ponts et chaussées" of every grade.

**The Building Act Committee** of the London County Council recommended that the new street from Holborn to the Strand should be called "Edward VII. Street," and the crescent "Gladstone Crescent." At the meeting on Tuesday the motion was withdrawn.

**The College of Heralds**, at the request of the Chelsea Borough Council, has drawn up a design of a coat-of-arms for Chelsea. The Council has submitted its wishes, and the college has translated them into heraldic language. The scarlet quarters of the shield bear golden devices in the following order:—In the first quarter is an ox, the symbol of St. Luke, who is the patron saint of the parish; in the second quarter the arms of Lord Cadogan, the lord of the manor; in the third an adaptation of the arms of the Sloane family; and in the fourth a stag's head from the arms of Stanley. An abbot's staff in the centre has reference to the Abbey of Westminster, the ancient lords of the manor.

**The Scaffolding** which is necessary for the examination and reparation of the façade of the Madeleine, Paris, is now in process of erection.

**Lieutenant-Colonel Boudin**, a Chevalier of the Legion of Honour, died suddenly in the Louvre before a painting on which his admiration appeared to be concentrated.

**The Bishop of Rochester** consecrated the new church of St. Bartholomew, Wycliffe Road, Lavender Hill, on Tuesday, Mr. G. Fellowes Prynne being the architect of the building. The cost is 8,500*l.*

**Madame Lefeuil**, the widow of the late Hector Martin Lefeuil, has died in Paris. He was the successor of Visconti at the Louvre, and the interior of the new part is in a great measure to be ascribed to him. He died in 1880.

**The Secretary of War** has recognised the advantages of the removal of the Duke of York's School, Chelsea, and though no actual decision has been arrived at on the subject, in all probability steps will be taken shortly to secure a site adaptable for the purposes of the institution in some healthy country district. It is felt that it would be to the advantage of the school in many ways if it were housed in modern buildings and with better facilities for playing-fields.

**Langtoft Church**, near Driffield, Yorkshire, has been restored and enlarged under the direction of Mr. C. Hodgson Fowler, F.S.A. Sir Tatton Sykes paid all expenses.

**The Report of the Council of University College, Liverpool**, states that a sum of 4,666*l.* had been advanced for the purchase of land in Brownlow Street, so securing a site of exceptional value for college extension. The committee also voted a sum of 20,000*l.* to complete the buildings of the medical school. The Council recently made further applications for help—to build new laboratories, urgently required by the departments of zoology and electrotechnics; to provide for the extension of the Victoria building, now seriously overcrowded.

**The Collection Dutuit** is expected to be opened in December in the Petit Palais of the Champs-Élysées. The works are being arranged by M. Georges Cain.

**The Royal Scottish Society of Painters in Water-Colours** opened their exhibition last week in their galleries in Glasgow. The drawings number 236.

**Sir C. Douglas Fox** recommends the erection of a lift by which the tramway-cars would be raised and lowered in Halifax in order to continue the extension to Greetland. The lift would cost 10,000*l.* more than an alternative scheme.

**The General Electric Company** have settled six claims for compensation under the Workmen's Compensation Act, which were brought by girls who on the occasion of the recent fire at Queen Victoria Street had to jump from the fourth storey. Each of the girls is to receive 150*l.*, and the City of London Court will invest 154*l.* until the girls are twenty-one years of age.

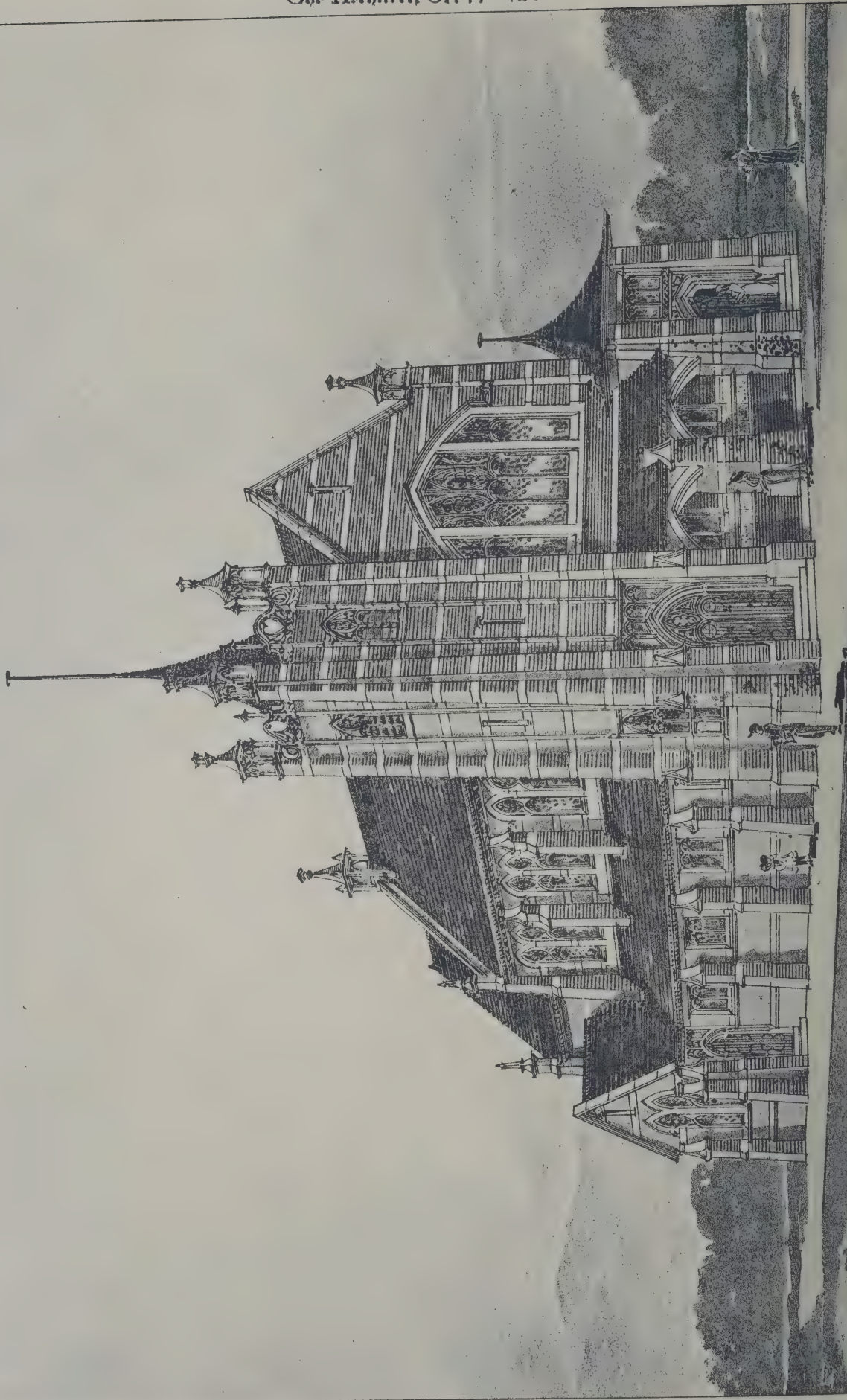
**A Memorial Statue of Queen Victoria** was unveiled at Leamington on Saturday. The statue is of Carrara marble and was sculptured by Mr. Albert Toft. Her Majesty is represented in a standing position holding the sceptre and orb. The statue is placed in front of the municipal buildings and has cost 1,600 guineas.

**The Liverpool Architectural Society** will hold its first members' meeting at the Free Public Library, William Brown Street, by kind permission of Mr. Peter Cowell, chief librarian, on Monday, October 20, at 6 P.M., when a selection of the chief architectural books, including various new works, will be on view.

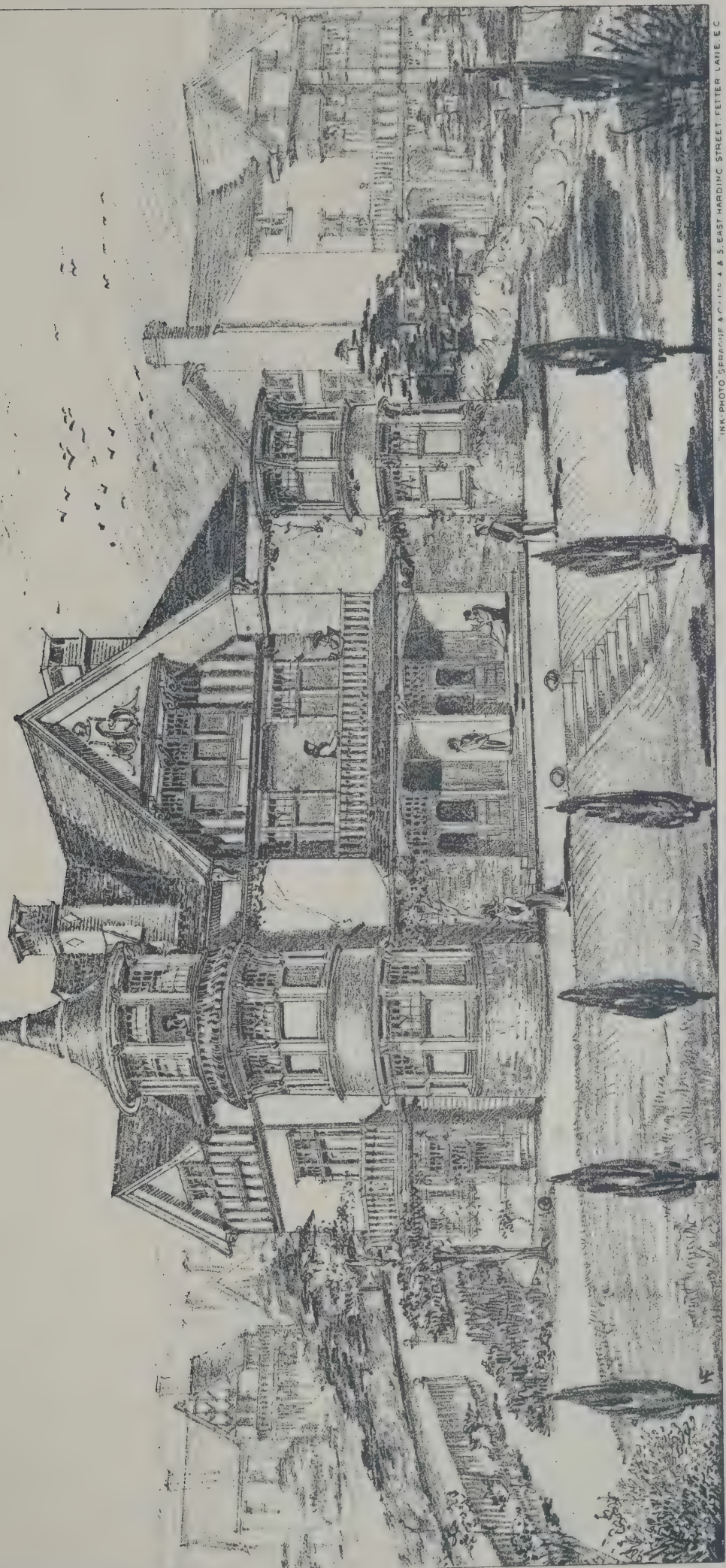
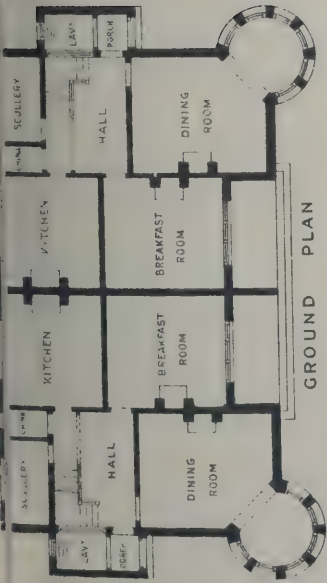












TWO HOUSES AT OLD COLWYN.  
Messrs, J. H. HICKTON and H. E. FARMER, F.F.R.I.B.A., Architects.

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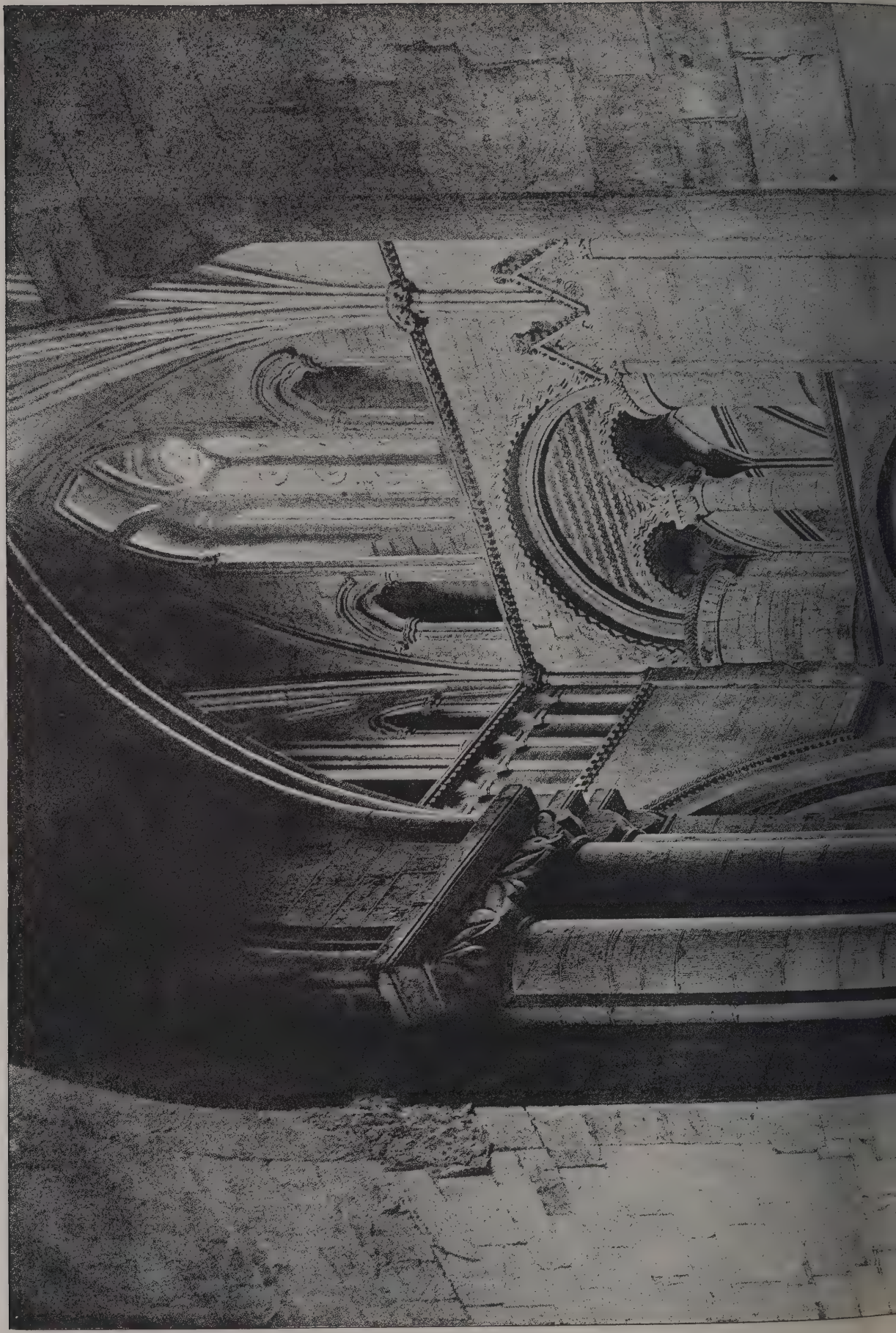








The Architect, Oct 17<sup>th</sup> 1902.







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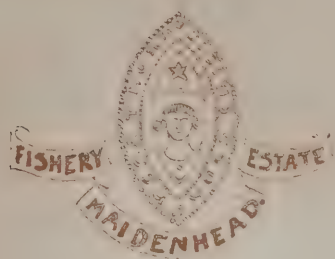






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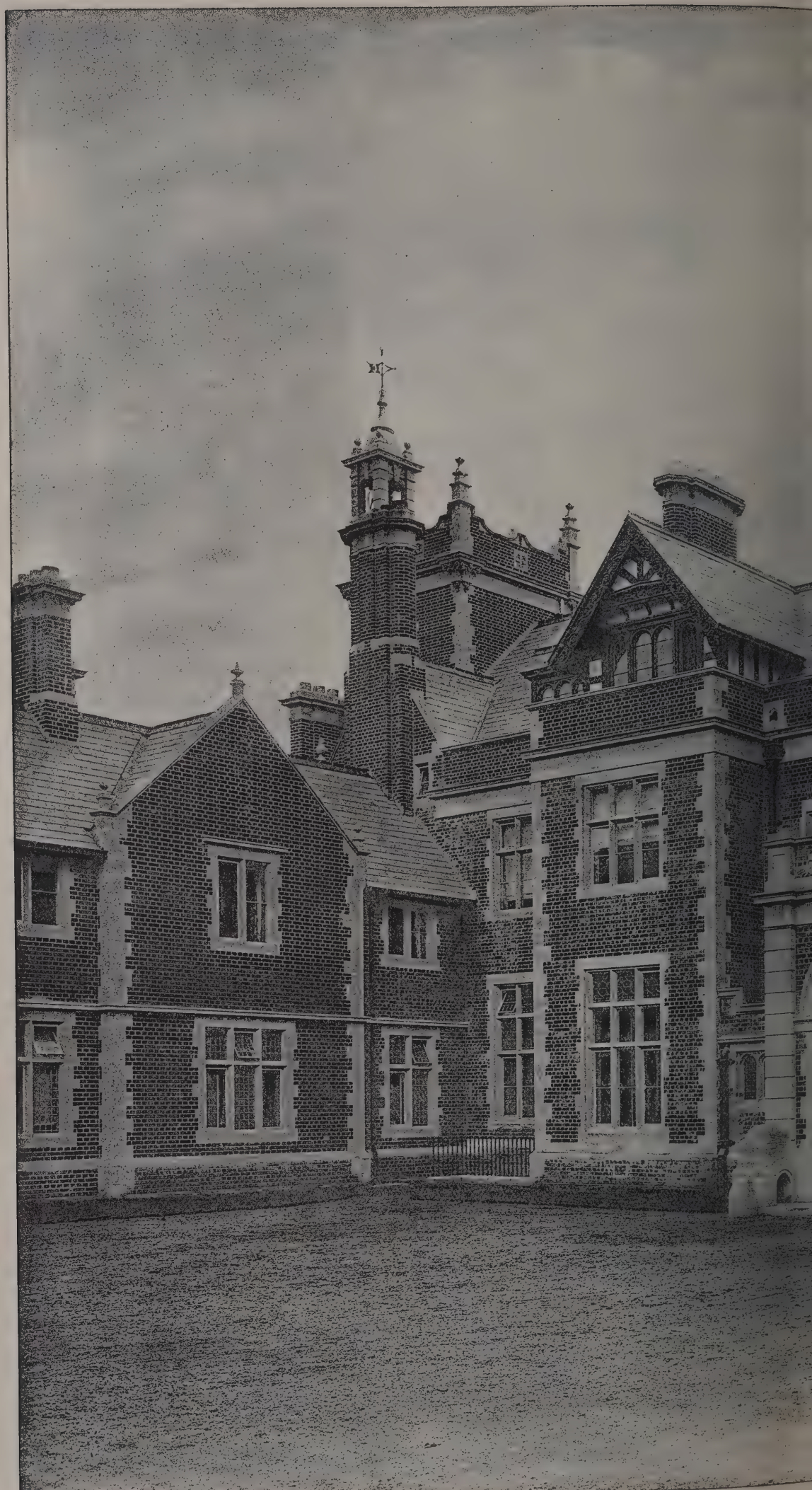






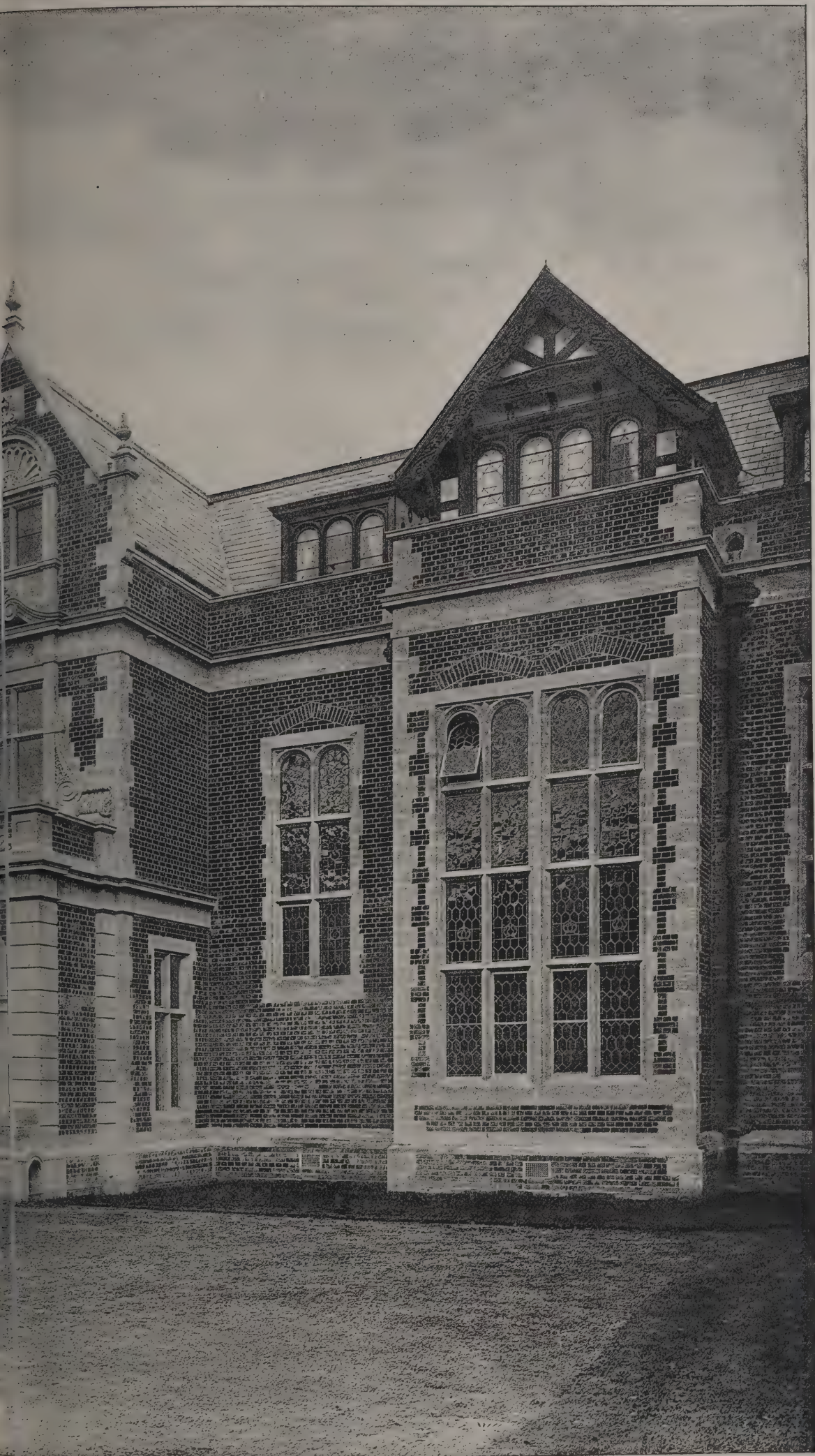






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THE

## Architect and Contract Reporter.

## EDITORIAL NOTICES.

*In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

## TENDERS, ETC.

*\*\* As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

## COMPETITIONS OPEN.

CAPE TOWN.—Jan. 31.—The Council of the University of the Cape of Good Hope invite designs for the erection of university buildings. Premiums of 400*l.*, 200*l.* and 100*l.* will be awarded to the authors of the designs placed first, second and third respectively. Particulars of the competition may be obtained on application to the Registrar at Cape Town, or to the Agent-General in London.

DURBAN (NATAL).—Dec. 18.—Designs are invited for new town hall, library, museum, art gallery and municipal offices. Three premiums of 500*l.*, 300*l.* and 200*l.* respectively will be awarded for the three best designs in order of merit. Mr. W. H. Radford, C.E., Albion Chambers, Nottingham.

## CONTRACTS OPEN.

ACCRINGTON.—Oct. 21.—For new works, Spring Hill, for Lang Bridge, Ltd.: (contract No. 2) erection and completion of the superstructures; (3) supply and fixing of constructional iron and steelwork. Mr. Henry Ross, architect, 15 Cannon Street, Accrington.

ACTON.—Oct. 21.—For erection of a house for the engineer at the Acton sewer works. Mr. D. J. Ebbetts, surveyor, 242 High Street, Acton, W.

ASTON.—Oct. 31.—For condensers for electricity station. Mr. Reginald P. Wilson, 66 Victoria Street, London.

BECKENHAM.—Oct. 27.—For erection of a timber platform over the covered swimming-bath, 100 feet by 30 feet in area, with a movable stage, &c. Mr. John A. Angell, surveyor, Town Hall, Beckenham, Kent.

BEVERLEY.—Oct. 22.—For erection of a house for the clerk and steward of the East Riding asylum. Mr. C. W. Hobson, clerk to the asylum, Newbegin, Beverley.

BILSTON.—Nov. 3.—For carrying-out the alterations and extensions of Lower Gornal Robert Street Infants' School, Coseley. Mr. A. Ramsell, architect, 187 Wolverhampton Street, Dudley.

BIRMINGHAM.—Oct. 20.—For supplying and fixing eaves and gutters at the workhouse, Gravelly Hill, Aston. Mr. John North, clerk, Union Offices, Vauxhall Road, Birmingham.

BISHOP AUCKLAND.—Nov. 6.—For erection of an administrative block, main pavilion, isolation pavilion, porter's lodge and outbathing block, laundry and disinfecting block, covered ways, boundary walls and fences, water supply, drainage, roads, &c., at the No. 2 isolation hospital buildings at Helmington Row. Mr. William Perkins, architect, Victoria Street, Bishop Auckland.

BRADFORD.—Oct. 24.—For erection of a Board school at Grange Road, Bradford. Messrs. T. C. Hope & Son, architects, 23 Bank Street, Bradford.

BRIDLINGTON.—Oct. 20.—For construction of underground lavatories in South Cliff Road. Mr. A. E. Matthewman, town clerk, Bridlington.

BRIERLEY HILL.—Oct. 21.—For erection of a technical school and free library at Brierley Hill, Staffs. Mr. William Waldron, clerk, U.D.C., 17 High Street, Brierley Hill.

BRIGHTON.—Nov. 5.—For alterations to part of the Royal Pavilion in Palace Place to adapt the premises to the purposes of a telephone exchange, &c. Mr. Francis J. C. May, surveyor, Town Hall, Brighton.

BRISTOL.—Oct. 21.—For erection of a lodge and construction of roads at Novers Hospital. Particulars on application to the City Engineer, 63 Queen Square, Bristol.

BROMSGROVE.—Nov. 15.—For erection of the first portion of the proposed new lunatic asylum on the Barnsley Hall estate, near Bromsgrove, Worcestershire. Mr. George T. Hine, architect, 35 Parliament Street, Westminster.

BURTON-UPON-TRENT.—Oct. 22.—For erection of a car depôt in Horninglow Street. Particulars may be obtained at the Borough Engineer's Offices, Town Hall, Burton-upon-Trent.

CAMBUSNETHAN.—Oct. 21.—For supply of pipes, cut, lay and fill in about 4,000 yards of drains (average depth, 7 feet) in connection with the extension to Cambusnethan cemetery. Mr. James Graham, cemetery superintendent, Cambusnethan, Wishaw.

CARLTON.—Oct. 22.—For erection of isolation hospital at Carlton, Notts. Mr. Fred Hopkinson, architect, 40 Bridge Street, Worksop.

COALVILLE.—Nov. 4.—For supply and delivery of the pipes and specials required in the construction of new waterworks. Mr. J. B. Everard, 6 Millstone Lane, Leicester.

COALVILLE.—Nov. 4.—For supply and delivery of No. 192 sluice, air and reflux valves, No. 219 screw-down hydrants, No. 89 expansion joints, and No. 4 Deacon's waste-detecting meters, with other fittings, surface boxes, name plates and posts required in the construction of new waterworks. Mr. J. B. Everard, 6 Millstone Lane, Leicester.

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**COALVILLE.**—Nov. 4.—For construction of a service reservoir to hold 500,000 gallons, the laying and jointing of mains, fixing fittings and testing and other work required in the construction of new waterworks. Mr. J. B. Everard, 6 Millstone Lane, Leicester.

**COALVILLE.**—Nov. 4.—For erection at the proposed new pumping station of two compound inverted tandem pumping engines, each capable of lifting not less than 240,000 gallons of water in twelve hours, and two steel Lancashire boilers, 6 feet 6 inches diameter, 20 feet long, including steam and water pipe connections and fittings, foundation bolts, plates and girders, overhead traveller, &c. Mr. J. B. Everard, 6 Millstone Lane, Leicester.

**COCKERMOUTH.**—For repairs and pointing of the chapel steeple at the cemetery. Mr. T. Cuthbert Burn, clerk, Main Street, Cockermouth.

**CREWE.**—Oct. 28.—For erection of a diphtheria pavilion for twelve beds and other additions to the isolation hospital. Mr. G. E. Bolshaw, architect, 189 Lord Street, Southport.

**CRONDALL.**—Oct. 20.—For erection of a cottage at the district school, Whimble Hill, Crondall, Hants. Mr. A. H. Guyer, architect, South Street, Farnham.

**DARTMOUTH.**—Nov. 3.—For construction of about 2,500 feet of 9-inch earthenware pipe sewers, with manholes, lamp-holes, road gully, pits, &c. Mr. A. Smith, borough engineer and surveyor, Dartmouth.

**DEWSBURY.**—Oct. 20.—For alterations at the Boothroyd Lane Board school, Dewsbury. Mr. F. W. Ridgway, architect, Bond Street, Dewsbury.

**DOVER.**—Oct. 24.—For erection of new coastguard buildings, consisting of quarters for an officer and seven men, with watchroom, &c., at East Cliff, near Dover. Particulars may be obtained at the Coastguard Station, East Cliff.

**GOLCAR.**—Oct. 20.—For erection of a weaving-shed and warehouse (floor area 25,582 square feet) at Stanley Mills, Golcar, Yorks. Mr. Arthur Shaw, architect, Golcar.

**GREENWICH.**—Oct. 28.—For supplying and fixing a five-brake h p gas engine for chaff-cutting purposes, at the Council's depôt, Banning Street, East Greenwich. Particulars can be obtained from the Borough Engineer and Surveyor, Town Hall, Greenwich Road.

**GREENWICH.**—Oct. 29.—For the work of taking up the existing flooring of the dust shoot jetty at the Council's depôt,

Banning Street, East Greenwich, and relaying the same with 3-inch pine. Mr. Francis S. Robinson, town clerk, Town Hall, Greenwich Road, S.E.

**HARROGATE.**—Nov. 1.—For supply, delivery and erection of a hydraulic water-motor pump capable of lifting 150 gallons of water per minute to a height of about 100 feet, together with the necessary inlet, outlet, waste and suction pipes, also valves and other connections. Mr. Edward Wilson Dixon, engineer, 14 Albert Street, Harrogate.

**HEMSWORTH.**—Oct. 20.—For erection of ten dwelling-houses, &c., at Hemsworth, Yorks. Messrs. Tennant & Bagley, architects, Pontefract.

**HILL END, ST. ALBANS.**—Oct. 27.—For construction of drains, sewers, manholes, ventilators, sewage tanks, bacteriological filters, sewage and effluent pipes, water carriers, laying-out land, &c., in connection with the asylum. Mr. Baldwin Latham, engineer, Parliament Mansions, Victoria Street, Westminster.

**HUDDERSFIELD.**—Oct. 24.—For erection of two semi-detached villa residences in Park Drive. Mr. J. Berry, architect, 3 Market Place, Huddersfield.

**IRELAND.**—Oct. 20.—For supply of 3,000 to 4,000 tons of steel bull-head rails, with the necessary fish plates, for the Great Northern Railway of Ireland. Mr. T. Morrison, secretary, Amiens Street, Dublin.

**IRELAND.**—Oct. 22.—For additions and repairs to Newtown Cunningham Catholic chapel. Mr. Daniel Conroy, architect, 21 Shipquay Street, Londonderry.

**IRELAND.**—Oct. 22.—For erection of a block of shops and offices in Arthur Street, Belfast. Messrs. Young & Mackenzie, Scottish Provident Buildings, Belfast.

**IRELAND.**—Oct. 22.—For erection of eighty-four labourers' cottages in the South Dublin Rural District, viz. fifteen cottages, under four contracts, in Clondalkin electoral division; fifteen cottages, under seven contracts, in Palmerston electoral division; thirty-seven cottages, under fourteen contracts, in Tallaght electoral division; and seventeen cottages, under nine contracts, in Whitechurch electoral division. Mr. T. J. Byrne, surveyor, 1 James's Street, Dublin.

**IRELAND.**—Oct. 25.—For additions and alterations to the nurses' apartments at the workhouse infirmary, Londonderry. Mr. M. A. Robinson, architect, Richmond Street, Londonderry.

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IRELAND.—Oct. 29.—For additions and alterations to the Londonderry county and county borough infirmary. Mr. Albert E. Murray, architect, 37 Dawson Street, Dublin.

IRELAND.—Oct. 31.—For rebuilding premises 52 South Mall, Cork. Messrs. W. H. Hill & Son, architects, Cork.

ISLEWORTH.—Oct. 28.—For erection of vagrant wards at the workhouse at Isleworth. Mr. W. H. Ward, architect, Paradise Street, Birmingham.

LANCASTER.—Oct. 21.—For a new direct coupled dynamo of not less than 700 16-candle power and switchboard, to specification obtainable from the Medical Superintendent, County Asylum.

LEWISHAM.—Nov. 4.—For construction of underground sanitary conveniences at Lee Green and Catford. Particulars can be obtained at the Surveyor's Office, Town Hall, Catford, S.E.

LOUGHBOROUGH.—Oct. 21.—For erection of a Board school to accommodate 300 children in Rendell Street, Loughborough, Leicester. Messrs. Barrowcliff & Allcock, architects, Mill Street, Loughborough.

MASHAM.—Oct. 25.—For supply and delivery of about 550 tons of cast-iron pipes, 20 inches and 24 inches in diameter, also about 25 tons of special castings in connection with the waterworks. Mr. Edward Wilson Dixon, engineer, 14 Albert Street, Harrogate.

NEWCASTLE-ON-TYNE.—Oct. 31.—For erection of concrete tramway car-sheds at Wingrove, Newcastle-upon-Tyne. Mr. A. E. Le Rossignol, Manor Powers Station, Newcastle.

NEWCASTLE-ON-TYNE.—Nov. 6.—For supply and erection (complete) of a new triple-expansion direct-coupled engine of 3,000 horse-power at the power station, Newcastle-on-Tyne. Mr. A. E. Le Rossignol, general manager, Manors Powers Station.

OGBOURNE ST. GEORGE (WILTS).—Nov. 8.—For supply, delivery and erection of pumping plant at the waterworks. The Borough Surveyor, Town Hall, Swindon.

PEBMARSH.—For re-erection of the buildings destroyed by the late fire at Collin's farm, Pebmarsh, near Bures, Essex. Mr. C. P. Whiteley, surveyor, 82 Queen Street, Cheapside, E.C.

PLYMOUTH.—Oct. 20.—For erection of block No. 4, fronting Looe Street, in connection with the Housing of the Working Classes Act, 1890. Mr. James Paton, borough surveyor, Town Hall, Plymouth.

SCOTLAND.—Oct. 20.—For construction of Lothian Road goods yard, Barrel Bank Covering, Edinburgh. Caledonian Railway Company's Divisional Engineer, Princes Street Station, Edinburgh.

SCOTLAND.—Oct. 21.—For additions to Muiravonside Public school, Falkirk. Mr. James Strang, architect, Falkirk.

SCOTLAND.—Oct. 27.—For erection of a combination infectious hospital at the east end of Old Rattray, the erection of boundary walls, &c. Messrs. L. & J. Falconer, architects, Blairgowrie.

SCOTLAND.—Oct. 28.—For construction, supply and erection under one contract of the machinery and accessories required for the mechanical equipment of the machinery buildings at the Dalmaur outfall works, Glasgow. Mr. David Howe Moreton, 130 Bath Street.

SHEFFIELD.—Oct. 21.—For erection of a public elementary school at Hammerton Street, Sheffield. Mr. W. J. Hale, architect, 13 St. James's Row, Sheffield.

SIDCUP.—Oct. 23.—For erection of schoolrooms at the new school homes near Sidcup, Kent. Messrs. Thomas Dinwiddy & Sons, architects, 12 Crooms Hill, Greenwich, S.E.

SILLOTH.—Oct. 25.—For slater, plumber and plasterer's work at two houses, Silloth, Cumberland. Mr. Geo. Armstrong, architect, 24 Bank Street, Carlisle.

STAMFORD.—Oct. 27.—For erection of an infants' room at Greatford school, and removing and rebuilding the existing outer offices. Specifications and plans to be seen at the school or sent on application.

SUDBURY.—Nov. 1.—For erection of machinery and destructor buildings at the sewage pumping station, Ballingdon Street, Sudbury, Suffolk. Mr. T. W. A. Hayward, borough surveyor, Town Hall, Sudbury.

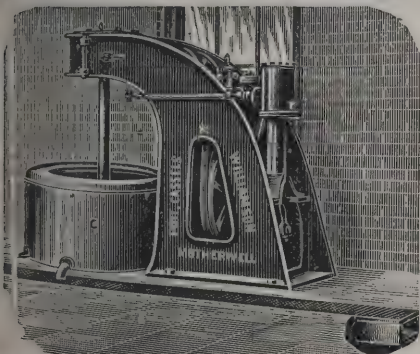
SUMMERSEAT.—Oct. 27.—For reconstruction of the existing tanks, sludge filters, &c. Mr. James Diggle, Hin Hill Street, Heywood.

SWADLINCOTE.—Oct. 22.—For erection of a chimney-shaft 70 feet high. Mr. W. A. Musson, clerk, Swadlincote, Burton-on-Trent.

SWINTON.—Oct. 22.—For cleaning-out, widening and deepening a 10-inch diameter borehole. Mr. Robert Fowler, surveyor, Council Offices, Station Road.

TORQUAY.—Oct. 22.—For about 39 tons of 3-inch and 4-inch pipes and special castings. Mr. W. Ingham, water engineer, Town Hall Chambers.

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**WIGAN.**—Oct. 20.—For electrical equipment of a short length of new tramway and a portion of the existing tramways. Mr. Jas. Slevin, borough electrical engineer, Bradford Place, Wigan.

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The above paragraph appears in our contemporary the *Sum*. We fancy the statement that the English-made safe was so unfortunate must be inaccurate as far as our leading safe makers of this country go. We have no hesitation whatever in stating they can vie both for strength and finish with any American or other foreign manufacturer.

ON the question of the erection of a new theatre for Aberdeen the Town Council of the city have taken action which, it is expected, will result in an early commencement with the scheme. They agreed to the application on behalf of the Robert Arthur Theatres Company, Ltd., for a feu of a piece of ground on the north side of Rosemount viaduct, adjoining the Free South church, and this site, which has a frontage of 117 feet to Rosemount viaduct, is to be exposed for sale by public roup at the upset feu duty of 234*l.* per annum. The building has to be completed within two years from the term of entry, which is to be at Martinmas of this year, and the first half-year's feu is to be payable at Whit Sunday 1905. It is stipulated that the walls of the building fronting Rosemount viaduct shall be of fine axed granite, and in the event of an ornamental portico or porch being erected the columns shall be retired to the same line as the columns of the Free South church.

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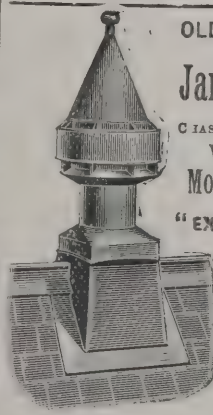
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T. Bendon	15,687	0	0
J. & M. Patrick	15,583	0	0
Thomas & Edge	15,499	0	0
H. Wall & Co.	15,367	0	0
B. E. Nightingale	15,401	0	0
Holliday & Greenwood, Ltd.	15,378	0	0
H. L. Holloway	15,300	0	0
J. E. Johnson & Son	15,199	0	0
W. Marriage & Co.	15,180	0	0
Todd & Newman	15,128	0	0
Sims & Woods	15,000	0	0
W. J. Renshaw	14,639	0	0
DEARING & SON (accepted)	13,976	0	0

HESWALL.

For street works in Hill Side Road, Cheshire. Mr. THOMAS DAVIES, surveyor, 33 Kingsland Road, Birkenhead.

R. S. Amery	£1,632	2	0
W. Maddock & Co.	1,490	5	0
R. Hughes	1,100	0	0
S. HUTTON, Bowdon (accepted)	908	7	7

HOCKLEY.

For erection of a mixed school for 200 children, teacher's residence, offices and boundary fences, &c., in Hockley village. Mr. WALTER J. WOOD, architect, 26 Alexandra Street, Southend-on-Sea.

D. Lamb, for the Salvation Army Farm Colony	£3,911	10	0
Clare Bros.	3,606	10	0
S. E. Moss	3,541	9	0
Coulson & Lofts	3,539	0	0
F. Wilmot	3,360	0	0
HOWARD & RUFFLE, Hockley (accepted)	3,387	10	0
E. West	3,334	0	0
F. Dupont & Co.	3,320	0	0
F. & E. Davey	3,287	0	0
Davis & Leaney	3,224	0	0
R. Elvey	3,150	0	0

HOVE.

For street works in Fourth Avenue and Stoneham Road. Mr. H. H. SCOTT, borough surveyor.

Accepted tenders.

Fourth Avenue.

J. Parsons & Sons, Church Road	£56	0	0
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Stoneham Road.

J. Parsons & Sons	336	0	0
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IRELAND.

For rebuilding premises in Academy Street, Cork. Mr. ARTHUR HILL, architect, 22 Georges Street, Cork.

Hamilton & Co.	£2,400	0	0
A. Gaul	2,300	0	0
P. Murphy	2,270	0	0
E. & P. O'Flynn	2,150	0	0
T. Kearns	2,118	0	0
D. Kelleher	2,077	0	0
S. Hill	2,037	0	0
J. DELANEY & Co., Cork (accepted)	1,900	0	0

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## IRELAND—continued.

For laying water-pipes, hydrants, &c., in Ship Street and New Street off Pound Street, Larne.

D. Dowds . . . . . £30 17 6  
J. KILPATRICK & SON, Larne (accepted) . . . . . 15 19 0

For repairs, painting, &c., at the workhouse, Dunfanaghy.

A. P. Hughes . . . . . £135 16 8  
J. MACMANUS, Letterkenny (accepted) . . . . . 130 0 0

For sewerage works at Malin Road, Moville.

W. McDEVITT, Gulladuff, Moville, co. Donegal (accepted) . . . . . £35 18 0

## KNARESBOROUGH.

For sewerage works in the Long Flatt. Mr. S. TURNER, surveyor.

A. Dixon . . . . . £219 0 0  
Stephenson . . . . . 190 0 0  
Fisher . . . . . 166 12 6  
Dickinson & Long . . . . . 158 19 0  
Buckley . . . . . 150 0 0  
OXLEY, Harrogate (accepted) . . . . . 146 10 0  
Dunn . . . . . 141 18 6

For digging and filling-in of a gas-main trench of about 213 yards in length in Back Lane, Knaresborough.

J. BUCKLEY, Thistle Hill (accepted) . . . . . £11 0 0

## LEYTON.

For supply and erection of about 450 yards of light wrought-iron fencing, 5 feet 6 inches high, to design prepared by the surveyor, with three double hang gates and gate posts complete. Mr. WILLIAM DAWSON, surveyor.

Ridgeway & Sons . . . . . £510 0 0  
G. V. Banbury . . . . . 453 0 0  
Bayliss, Jones & Bayliss . . . . . 435 15 0  
Jukes, Coulson, Stokes & Co. . . . . 409 16 0  
B. C. Barton . . . . . 400 0 0  
Raybould & Co. . . . . 381 15 0  
Hill & Smith . . . . . 375 0 0  
Bain & Co. . . . . 370 10 0  
J. ELWELL, Birmingham (accepted) . . . . . 348 15 0

## LINCOLN.

For alterations at the workhouse.

HALKES, Portland Street (accepted) . . . . . £115 16 0

## MARGATE.

For cutting and filling-in trenches and laying therein about 24,000 yards of cast-iron piping main 18 inches in diameter, with all the necessary bends, junctions, fittings, &c., from Margate to Wingham, near Canterbury. Mr. ALBERT LATHAM, borough engineer.

J. E. Kaye . . . . . £47,000 0 0  
W. Jowett . . . . . 25,924 8 6  
Paramor & Sons . . . . . 23,921 9 7  
R. E. Hodgman . . . . . 23,689 1 0  
T. Rowland . . . . . 23,174 18 10  
J. Mowlem & Co. . . . . 22,506 0 0  
A. S. Ingleton . . . . . 22,040 15 8  
W. L. Wallis & Co. . . . . 21,102 19 10  
Reid Bros. . . . . 21,034 2 8  
G. Bell . . . . . 20,889 11 4  
Millen & Chrisfield . . . . . 20,060 5 0  
Westminster Construction Co. . . . . 20,009 5 6  
T. C. Starkey . . . . . 19,335 4 6  
J. & T. Binns . . . . . 18,769 8 3  
A. Beale . . . . . 18,221 17 5  
H. P. Embrey, Ltd. . . . . 18,159 2 0  
C. Chamberlain . . . . . 17,308 10 0  
A. E. Nunn . . . . . 16,989 0 0  
J. H. Vickers, Ltd. . . . . 15,670 0 0  
B. Cooke & Co. . . . . 15,662 14 1  
J. Pollock & Co. . . . . 15,587 0 5  
Tuff & Muskin . . . . . 15,410 16 7  
H. Roberts . . . . . 15,299 16 3  
R. H. B. Neal . . . . . 15,202 12 7  
J. Moffatt . . . . . 14,938 1 5  
W. Manders . . . . . 14,871 0 0  
S. Saunders . . . . . 14,417 19 7  
DEAN & CO., Caxton Road, Chiswick (accepted) . . . . . 13,884 3 9

## NORTHALLERTON.

For sewerage works in the village of Brompton (South End).

J. Frost . . . . . £205 0 0  
Bushby & Son . . . . . 159 0 0  
A. W. Peacock . . . . . 155 0 0  
M. Stockdale & Son . . . . . 119 5 0

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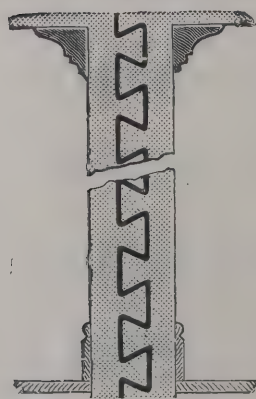
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NEWLYN.

For erection of a stores in the Coombe, Newlyn, Cornwall.  
Mr. HENRY MADDERN, architect, 26 Clarence Street, Penzance.

J. Berryman	£891	0	0
G. Cara	852	0	0
J. S. Tregenza	830	0	0
T. James	827	0	0
J. H. Nicholas	762	10	0
Perkins & Caldwell	755	0	0
C. Tregenza	700	0	0
J. Rowe	699	10	0
C. TREGENZA and T. JAMES, Mousehole, Paul (accepted).	637	0	0

RAMSGATE.

For street works. Mr. T. G. TAYLOR, borough surveyor.

*Harrison Terrace.*

E. J. Newby & Sons	£391	9	0
G. Home	361	12	6
A. E. Goodbourn	343	7	8
W. WILSON (accepted)	340	0	0

*Seafield Road.*

G. Home	464	0	0
E. J. Newby & Sons	446	7	5
A. E. Goodbourn	438	0	0
G. Griggs	424	9	0
W. WILSON (accepted)	400	0	0

*Mews Cottages.*

A. E. Goodbourn	95	3	8
G. Griggs	95	0	0
G. Home	92	10	0
E. J. Newby & Sons	91	7	5
W. WILSON (accepted)	85	0	0

*Model Cottages.*

A. E. Goodbourn	395	0	0
G. Home	369	0	0
E. J. Newby & Sons	366	11	10
W. WILSON (accepted)	333	0	0

PARKSTONE.

For street works on the Sandecoates Estate. Messrs. HANKINSON & SON, surveyors, Bournemouth.

M. Loader	£1,064	16	3
H. C. Brixey	962	10	9
Grounds & Newton	948	2	6
G. Maidment	908	7	7
G. T. Budden	895	4	2
W. P. SAUNDERS, Bournemouth (accepted)	871	5	0

SALE.

For erection of buildings for the Sale Urban District Council electricity supply. Mr. CHARLES HOPKINSON, engineer, 29 Princess Street, Manchester.

W. SOUTHERN & SONS, Salford (accepted)	£646	0	0
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ST. ALBANS.

For alterations to Board schools.

*Accepted tenders.*

Miskin & Son, improvements at Alma Road school	£57	0	0
Blow & Peters, fireplace at Hatfield Road school	51	5	0

SCOTLAND.

For erection of a nurses' home and pathological laboratory and mortuary at Woodilee Asylum, Lenzie, Glasgow. Messrs. JAMES SALMON & SON, architects.

*Brick, &c., works.*

Jas. Goldie & Son	£8,807	4	0
Robert Gilchrist & Son	8,634	0	0
Robert Murdoch & Son	8,218	0	0
John Paterson & Son, Ltd.	7,911	7	4
John Kirkwood	7,413	0	0
J. J. & P. McLachlan	6,965	11	3
Wm. Shaw & Son	6,844	5	9
FORREST & MCLEOD, Glasgow (accepted)	6,463	6	11

*Wright, &c., works.*

Walter Guthrie & Co.	5,250	0	0
Wm. Shaw & Son	5,158	19	2
Geo. Laird & Son	5,130	1	4
Miller & Murray	5,026	7	0
John Peter	4,993	15	9
John Baxter & Sons	4,033	6	5
A. NIVEN & SONS, Glasgow (accepted)	4,540	7	10

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## SCOTLAND—continued.

For erection of stone school to accommodate 900 pupils, janitor's house, offices, parapet, area and boundary walls, bacteria tanks and drainage works, and making-up of playgrounds at Auchterderran, Cardenden, Fife. Mr. WILLIAM WILLIAMSON, architect, 220 High Street, Kirkcaldy.

## Accepted tenders.

R. McRobbie, Crieff, excavator, mason and brickwork	£3,951	8	4
J. Munro, Cluny Bridge, Fife, carpenter and joiner	2,186	14	4
W. Stewart & Sons, Crossgates, Fife, slater	574	14	0
Thomson Bros, Kirkcaldy, iron and smith	448	0	0
J. Grant, Alloa, plasterer	446	11	7
J. L. Arnott, Glasgow, plumber	441	15	11
Meikle & Philip, Edinburgh, heating	287	0	0
Wilson & Wood, Glasgow, tiler	125	17	0
R. Boyle & Sons, Glasgow, ventilating	82	15	0
J. Haxton & Co., Kirkcaldy, glazier	64	0	4

## STOKE-NEXT-GUILDFORD.

For laying drains and other works in connecting twenty-three houses in Stoughton Lane, Stoke-next-Guildford, with the sewerage scheme. Mr. WILLIAM G. LOWER, surveyor, Guildford.

W. G. Edward	£530	0	0
Streeters & Todhunter	527	0	0
Newland & Higgs	489	0	0
Mitchell Bros.	485	0	0
Higlett & Hammond	480	0	0
Tribe & Robinson	476	0	0
S. Ellis	474	0	0
R. Wood	469	0	0
A. Johnson	467	0	0
H. J. Smith	463	0	0
R. Smith	458	0	0
W. Young	449	0	0
Lowe's Sanitary Engineering Co.	449	0	0
D. H. Porter	437	0	0
H. Capp & Son	415	14	1
A. & F. GAMMON, Guildford (accepted)	398	0	0

## SOUTHAMPTON.

For erection of Southampton head telegraph office.

Jenkins & Sons, Limited	£18,637	0	0
H. Stevens & Co.	18,349	0	0
Stevens, Bastow & Co., Ltd.	17,988	0	0
H. Cawte	17,956	0	0
Golding & Ansell	16,600	0	0

## STOCKPORT.

For street works in Myrtle Street, Sycamore Street, Ash Street, Oak Street and Passages 1 and 2 off Myrtle Street. Mr. JOHN ATKINSON, borough surveyor.

W. H. Williams	£1,664	2	8
N. Beddow & Co.	1,584	8	3
Gosling & Stafford	1,488	12	0
W. H. Eva	1,360	18	10
P. D. & S. D. HAYES, 35 Old Road, Stockport (accepted)	1,296	11	0

## TRING.

For street works in High Street and Frogmore Street, Tring, Herts.

E. Smith & Sons	£1,226	0	0
H. Fincher & Sons	1,215	0	0
J. Honour & Sons	1,118	0	0
T. Bristow & Bros.	1,039	13	0
Whitehead & Bros.	1,015	10	0
T. Free & Sons	1,012	0	0
Felkin & Watson	1,006	0	0
W. Williams (withdrawn)	927	13	10
TAYLOR & SMITH, Great Missenden, Bucks (accepted)	920	6	4

## UXBRIDGE.

For construction of a concrete wall at the side of the stream opposite The Woodman beerhouse, Eastcote. Mr. EDMUND BIRKS, surveyor, Town Hall, Uxbridge.

A. J. Moore	£120	0	0
C. Brown & Son	101	10	0
J. J. Pratt	96	10	0
W. T. Wilson	90	0	0
A. E. Wilson	70	4	0
G. R. BROWN, Manor Court Farm, Harefield (accepted)	57	10	0



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TWO HOUSES AT OLD COLWYN.

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UTTOXETER.

For sewerage works in the district. Messrs. WILCOX & RAIKES, engineers, 63 Temple Row, Birmingham.

W. Graham & Sons	£17,300	0	0
J. Benson	16,855	0	0
H. P. Embrey, Ltd.	16,573	0	0
F. Woolley	15,905	0	0
Jowett Bros.	15,275	10	4
J. & J. Warner	15,268	0	0
G. F. Tomlinson	14,990	0	0
B. Cooke & Co.	14,968	0	0
J. S. Dawson	14,917	10	6
Johnson & Langley	14,815	0	0
G. Trentham	14,716	0	0
J. & T. Binns	14,703	2	3
W. Jones & Sons	14,646	5	0
G. Bell	14,561	0	0
W. J. Foster	14,230	0	0
W. Morley & Sons	14,115	6	7
R. W. Barker	14,047	9	0
Bower Bros.	13,926	0	0
F. Barke	13,913	0	0
Barker Bros.	13,828	0	0
T. Vale	13,800	0	0
T. Lowe & Sons	13,690	0	0
W. Smith & Sons	13,171	0	0
J. MACKAY, 39 Bearwood Road, Smethwick (accepted)	12,997	0	0

WALES.

For street works at Trevethic Street, Merthyr Tydfil. Mr. THOS. F. HARVEY, surveyor.

W. Brown	£578	15	0
R. Webb	544	5	1
JONES & DAVIES, Dowlais (accepted)	500	18	0

For erection of a schoolroom at Dynevor. Messrs. MARTYN & LLOYD, architects, Dynevor Post Office, Neath.

J. D. Ogley	£575	0	0
S. Harris	550	0	0
THOMAS & REES, Dynevor (accepted)	519	0	0

For street works in West Street, Abercynon. Mr. JOHN WILLIAMS, surveyor.

J. Sutherland	£132	2	7
E. Taylor	118	8	2
R. WEBB, Abercynon (accepted)	108	0	0

For erection of two new classrooms and a new lobby for infants' department, the connection of same with existing premises, the alteration of two present classrooms, the erection of four new out-offices, &c., at the Board schools, Cwncarn, Mon. Mr. R. L. ROBERT, architect, Abercarn.

J. Linton	£837	0	0
C. F. Morgan	825	0	0
J. Jenkins	799	10	0
D. W. Richards, Ltd.	795	0	0
DAVIES BROS., Abercarn (accepted)	780	14	0

For erection of a curate's house at Bryn, near Port Talbot. Mr. FRANK B. SMITH, architect, Port Talbot.

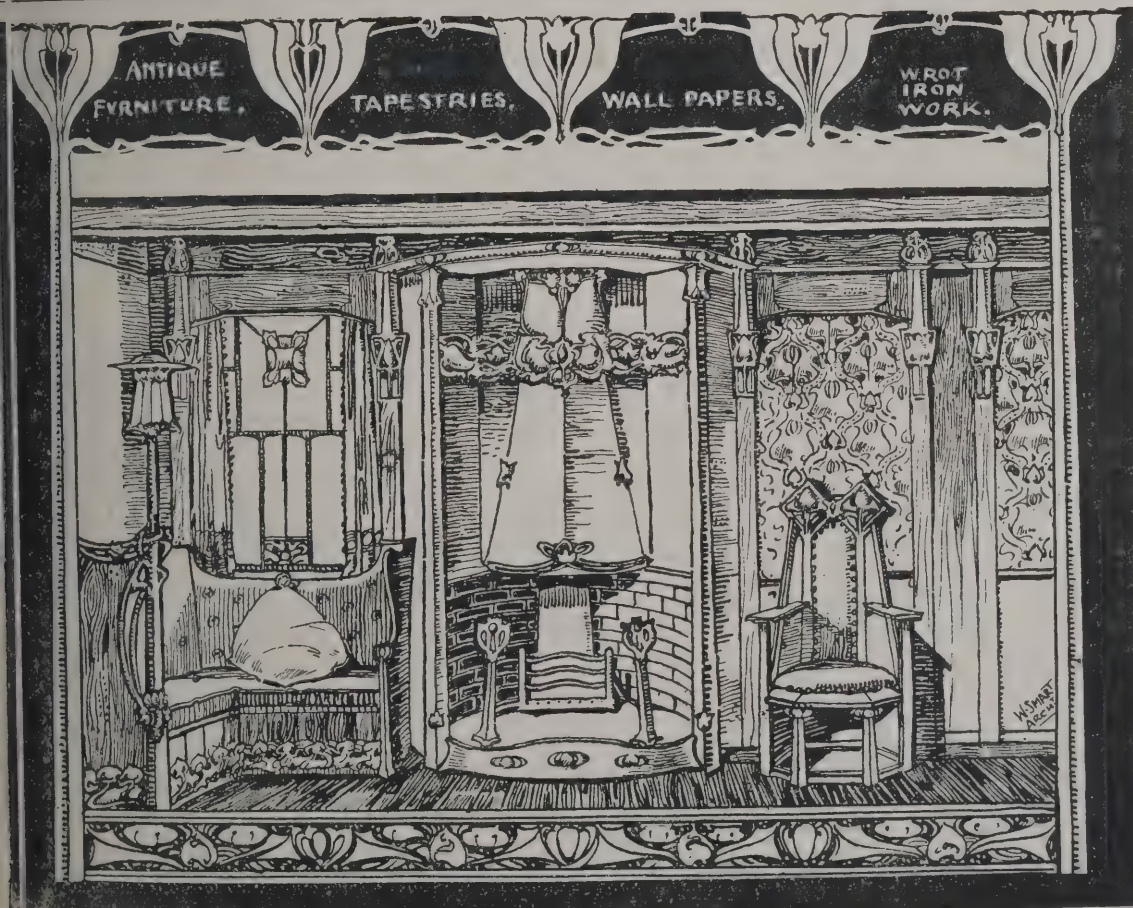
Humphrey & Co.	£947	0	0
Lattey & Co.	908	0	0
C. & F. CAERS, Port Talbot (accepted)	819	0	0

For erection of a mixed school to accommodate 160 children and teacher's house at Brynna, Llanharran.

F. G. Robbins	£2,380	0	0
P. Gaylard	1,915	0	0
E. REES & SONS, Bridgend (accepted)	1,797	0	0
David & Rees	1,785	0	0

For providing and laying about 200 yards of 9-inch pipe drain at Maesteg. Mr. FRANK B. SMITH, surveyor, Port Talbot. J. O. BIREN, Maesteg (accepted).

	£89	2	4
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## WALES—continued.

For erection of a cottage hospital, &c., at Rhymney, Mon.		
Messrs. LLEWELIN, SMITH & DAVIES, architects, Aberdare.		
Davis & Francis . . . . .	£2,605	0 0
E. Gronow . . . . .	2,496	0 0
J. Morgan . . . . .	2,452	0 0
T. F. Howells . . . . .	2,446	0 0
T. Jones . . . . .	2,445	11 0
W. WILLIAMS & SON, New Tredegar (accepted)	2,285	15 0

## WANDSWORTH.

For erection of six maisonettes in Wandsworth Bridge Road.		
Messrs. F. & W. STOCKER, architects, 90 and 91 Queen Street, E.C.		
W. J. Coleman & Co. . . . .	£6,000	0 0
Swan & Son . . . . .	4,285	0 0
G. Coffin & Son . . . . .	3,700	0 0
F. W. Dunkley . . . . .	3,645	0 0
W. GODDARD, Kimberley, Highworth Road, New Southgate (accepted)	3,610	0 0
Newton & Burgess . . . . .	3,475	0 0

## WARE.

For supplying and laying 566 yards of 3-inch cast-iron water main in Cross Street, Raynsford Road, Belle Vue Road and Garland Road, Ware, Herts. Mr. J. E. SMALES, surveyor, New Road, Ware.		
A. J. Goodfellow & Co. . . . .	£229	12 0
M. S. Ketteringham . . . . .	203	14 0
W. H. Hinkins . . . . .	193	16 1
D. H. PORTER, 2 Holly Villas, Clapton Square, N.E. (accepted)	193	0 0

## WESTON-SUPER-MARE.

For erection of two cabmen's shelters. Mr. HUGH NETTLETON, surveyor.		
S. Wilcox . . . . .	£112	6 0
W. Parnall . . . . .	71	9 6
C. Tear . . . . .	70	10 0
M. Jones . . . . .	60	0 0
C. ADDICOTT, Weston-super-Mare (accepted)	50	10 0

## WIBSEY.

For street works at Northfield, Wibsey, Yorks. Mr. JOSEPH COWGILL, engineer, Pearl Assurance Buildings, Bradford.		
WATMOUGH & PRESTON, Bradford (accepted)	£600	12 0

## WINDSOR.

For erection of a curator's house at the Windsor Cemetery.		
G. Pether . . . . .	£600	0 0
Hollis & Son . . . . .	560	0 0
Cooper & Son . . . . .	542	10 0
Butcher & Hendry . . . . .	515	0 0
A. H. Reavell . . . . .	495	0 0
H. Benfoot . . . . .	449	0 0
W. Green . . . . .	347	0 0
R. FORMAN, Windsor (accepted)	340	0 0

## WOODFORD.

For street works in Granville, Albert, Ashford, Oakdale, Beechcroft, Woodville, Oxford and Forest roads. Mr. WILLIAM FARRINGTON, surveyor.		
FRENCH BROS, Buckhurst Hill (accepted)	£4,410	0 0

## WOOLWICH.

For alterations and additions to Old Park House, and for additions, repairs, drainage, &c., to Goldie Leigh, both situate in Long Lane, Bostal Heath, Plumstead. Messrs. CHURCH, QUICK & WHINCOP, architects, William Street, Woolwich.		
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## Old Park House.

E. Proctor . . . . .	£925	0 0
Thomas & Edge . . . . .	897	10 0
Stephens & Son . . . . .	850	0 0
W. Mills . . . . .	819	0 0
Ennes Bros. . . . .	818	0 0
A. E. Lymes . . . . .	706	17 6
F. W. Harris . . . . .	698	0 0
G. G. Page . . . . .	574	10 0

## Goldie Leigh.

W. Mills . . . . .	692	0 0
E. Proctor . . . . .	670	0 0
Thomas & Edge . . . . .	652	0 0
A. E. Lymes . . . . .	634	13 6
Stephens & Son . . . . .	630	0 0
Ennes Bros. . . . .	611	0 0
Chuter & Perrott . . . . .	599	10 0
F. W. Harris . . . . .	552	0 0
G. G. Page . . . . .	521	0 0



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WORTHING.

For alterations and additions to the municipal offices. Mr. F. ROBERTS, surveyor.  
F. Sandell & Sons . . . . . £498 0 0  
Blaker & Son . . . . . 422 0 0  
W. W. Sandell . . . . . 415 0 0  
W. H. SAWLE (accepted) . . . . . 395 7 0

Received too late for Classification.

CROYDON.

For furniture to be fixed at Swan and Sugar Loaf hotel, Brighton Road, Croydon, for Mr. J. E. Brown. Mr. FRANK WINDSOR, architect, 9 and 10 Bank Buildings, George Street, Croydon.  
WARING & CO. (accepted) . . . . . £143 0 0

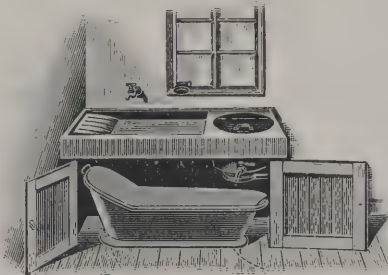
DUDLEY.

For erection of the Upper Standard school, for the Dudley School Board.  
M. ROUND, Dudley (accepted) . . . . . £11,760 0 0

BATHS FOR SMALL DWELLINGS.

THE time when a bath-room was considered a luxury even in good-class houses and one hardly to be expected in those of medium size has now happily passed away, and the luxury of yesterday has to-day become a necessity.  
That it is equally so in smaller dwellings is obvious, but the working man who wants it most least often finds this accommodation, although believing that cleanliness is next to Godliness, and knowing that it is the greatest security for healthiness.  
The reason for the absence of a bath-room in small houses is not far to seek. In every town the cost of the ground, high price of materials and increased wages of the operatives leaves comparatively but a small return on the outlay, and it is not possible to provide better accommodation without further expenditure, which will be unproductive unless an increased rent be charged, and to get that will be found difficult.

But this, we believe, need no longer account for the absence of a bath having an ample hot and cold water supply, even in the smallest house, as we will show this accommodation can now be added without any increase in the cost of building. This is effected by the introduction of a combined bath, sink and wash-boiler which was exhibited at the Health Exhibition held in connection with the recent Sanitary Congress at Manchester, where it attracted considerable attention and received much favourable comment. A brief description will enable our readers to readily understand the principle and its advantages. In place of the usual sinkstone is used one made of artificial stone 5 feet 8 inches by 2 feet, having a dish in the centre, a drainer at one end, and a circular rabbeted hole at the other, into which is placed a wash-boiler made of sheet copper, tinned inside, fitted with hinged lid and a brass tap near the bottom. Beneath the sinkstone is fitted the bath mounted on small rollers, and at the narrow end the brass outlet is fixed by a swivel arrangement to a wrought-iron outlet pipe, which are both either fixed to or buried in the floor, forming a pivot, so that the head of the bath can be drawn into the kitchen. Fig. 1 shows the sinkstone,

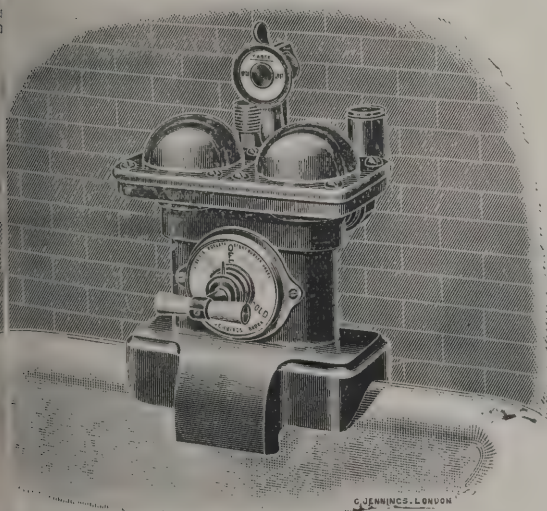


the method of fixing the boiler and the bath. The boiler is filled from the ordinary tap by attaching a short length of rubber pipe, and is heated by a patent multitubular Bunsen gas burner. As the hot water is drawn off into the bath the boiler is replenished from the cold-water tap and a continuous supply of hot water is obtained until the bath is filled. The waste pipe of the sink is carried behind the bath into a gully outside.  
We have gone into the question of cost of the sink, boiler and fittings and bath, and find that it is no more than an ordinary

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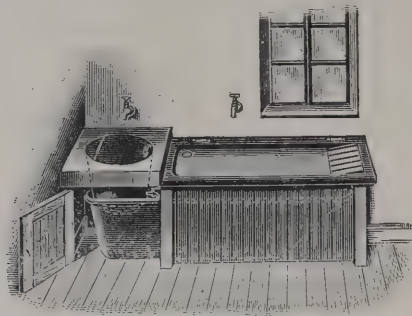
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kitchen sink and built-up wash boiler, but the adoption of this system would be greatly appreciated by the tenant, and the owner should find an increasing demand for houses so fitted. Fig. 2 shows the bath fixed, but not made to draw out into the room. In this case the sink is made of enamelled iron secured to the underside of a strong hardwood frame,



and hinged so as to lift up when the bath is required, and below the waste grate a spigot fits into a cone when the bath is down; while the outlet to the bath is attached by a union to the waste pipe carried through the wall to the sink gully. A separate cold-water tap for supplying the boiler is recommended for this bath.

The advantages of this system are many—no bath-room is required, there is no chimney or flue, any level floor will do for fixing, the hot-water supply is independent of the kitchen fire, there are no circulation pipes to burst with the frost, no more space is required than for an ordinary sinkstone and built-up boiler, and they are easily fixed by an ordinary workman. These baths are being introduced by the Kitchen Bath Fitment Company, 515 Queen's Road, Sheffield, who no doubt will be ready to give fuller particulars.

THE Batley Town Council have decided to defer the erection of a new town hall *sine die*. It has been resolved, however, to rebuild and enlarge the present hall (which was recently damaged by fire), so as to provide council-chambers, police-court and municipal offices under one roof.

### TRAMWAYS ON THE EMBANKMENT.

THE proposal put forward by the London County Council for the construction of an underground electric tramway over Westminster Bridge and along the Embankment, which was rejected by the Lords' committee, is to be revived. At an early meeting of the Council the highways committee intend to recommend that application be made in the next session of Parliament for powers for the construction by the Council of a double line of tramways from the present terminus in Westminster Bridge Road *via* Westminster Bridge, Victoria Embankment and that portion of the subway authorised by the London County Council (Subways and Tramways) Act, 1902, between the Strand and the Embankment to join at a point near the Strand the underground tramway authorised by that Act. In their report upon the matter the highways committee point out that the end to be aimed at is the provision of through facilities for persons to travel north and south, and that object will be gained if the scheme is made complete by establishing a connection between the Council's tramways at the Westminster Bridge terminus and the underground tramway at the Strand. The cost of making this line, if constructed on the underground conduit system of electrical traction, will be about 51,500l., to which must be added the cost of equipment. The committee are advised that the line will in all probability be remunerative from the outset if there is sufficient traffic to warrant a half-minute or even a three-quarter minute service.

### INSTITUTION OF CIVIL ENGINEERS.

THE Council of the Institution of Civil Engineers have, in addition to the medals and prizes given for communications discussed at the meetings of the Institution in the last session, made the following awards in respect of other papers dealt with in 1901-2:—A Telford gold medal to J. Macfarlane Gray, London; a George Stephenson gold medal to R. Price-Williams, London; a Watt gold medal to W. Bell Dawson, M.A., D.Sc., Ottawa; Telford premiums to W. R. Cooper, M.A., B.Sc., London; E. M. De Burgh, Sydney, N.S.W.; George Wilson, D.Sc., Manchester; Frank Oswell, B.A., Buenos Ayres; A. W. Brightmore, D.Sc., London; a Crampton prize to C. D. H. Braine, Mowbray, Cape Colony; the Manby premium to B. W. Ritso, Cape Town.

For students' papers the awards are:—A Miller scholarship

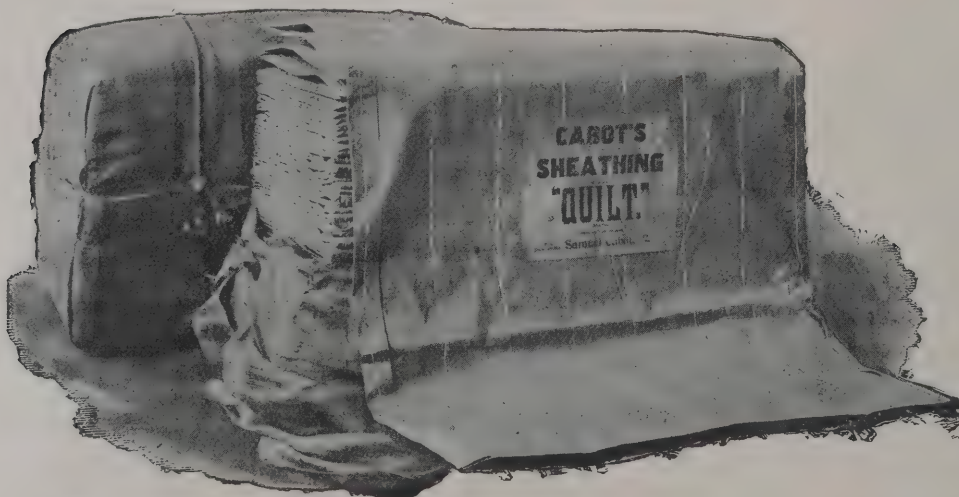
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enable for three years) and the "James Forrest" medal to J. F. Lloyd, Birmingham; Miller prizes to J. C. Collett and V. H. C. Clay, London; H. C. M. Austen, London; A. M. Carter, London; Robert Bruce, Manchester; L. F. Wells, B.Sc., Manchester; W. H. McLean, Glasgow.

CORRESPONDENCE.

Rifle Shooting as a Winter Pursuit for Working Men and Lads.

SIR,—May I ask you to afford a little space in the columns of your paper to bring again to the notice of your readers the objects of the Society of Working Men's Rifle Clubs, of which Field-Marshal Earl Roberts is president?

This Society was inaugurated at a meeting at the Mansion House in the Spring of last year, and since the publication of the last letter on the subject in December last has been instrumental in forming thirty-six miniature rifle clubs. Considering the difficulties which beset the path of every new institution, it will be admitted that our record is by no means a bad one.

The Society was formed for the purpose of affording facilities to the working classes to become skilled in the handling of the rifle. Its aim is to induce large numbers of wage-earning people to occasionally utilise their evenings—the only time which is at their disposal—in a manner which, while interesting to themselves, will also prove profitable to the State.

There are many places which, used only partially for other purposes, could be temporarily utilised during the winter season for rifle shooting. To establish a rifle club fully equipped with the apparatus recommended, rifles, &c., a hall or room of 40 feet or more in length is required, and a sum of 15*l.* will more than cover the initial cost, whilst without the apparatus a small club could be started for 5*l.* The profit on the sale of ammunition and a small subscription from members will cover the cost of maintenance.

The committee of the Society has just published a little book showing the best means of forming and conducting a miniature rifle club, and a copy will be gladly sent free of charge to any person interested in the subject. Samples of various kinds of apparatus recommended for use as indoor ranges can be seen at the Society's offices, 17 Victoria Street, Westminster, at any time, and any information on the subject

of miniature rifle shooting will be supplied on application to the Secretary at that address.

The committee are now arranging the details of a miniature "Bisley," *i.e.* a competition open to all miniature rifle clubs, to be held in March next. Some valuable prizes have already been offered, and full particulars of this competition will be forwarded to all clubs desiring to enter.

Thanking you in anticipation for inserting this letter,—I am, dear sir, yours obediently,

FRED LANCE, Lieut.-General.

Acting Chairman of the Committee,  
Society of Working Men's Rifle Clubs.

17 Victoria Street, Westminster, S.W.

TRADE NOTES.

ON and after October 13 the telegraphic address of the Ruabon Coal and Coke Company will be "Dennis, Ruabon."

MESSRS. HANDYSIDE & CO., LTD., of Derby, makers of steelwork for bridges, roofs, &c, have just completed the steelwork for the new building at Watford for Messrs. Bemrose & Sons, of Derby and London.

THE Columbian Fireproofing Company, Ltd., of 37 King William Street, E.C., have just obtained the contract for fire-proof floors and roofs for the large bakeries at Fulham for Messrs. Macfarlane, Lang & Co., of Glasgow, as well as for branch banks at Manchester and Deptford for the London City and Midland Bank, of Threadneedle Street.

WE have received from the Permanent Decorative Glass Company, Ltd, of 36 Basinghall Street, some samples of their "Florite" opal wall tiling, a new mural decoration, which consists of opalescent and various tinted glass tiles, which by means of a specially prepared backing are easily and permanently fixed. A notable feature of this Company's tiles is the method of decoration employed on them, in which the design, which is in various colours and very artistic style, is applied by a patent process which, it is claimed, is absolutely indestructible. Designs *en suite* for dado, filling, frieze and borders can thus be supplied, and forms a complete wall treatment of a novel, effective and permanent description, which, while eminently pleasing, is comparatively inexpensive, and is certainly worthy of the attention of the architect and the decorator.

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## ELECTRIC NOTES.

THE tramways and electric-light committee of the Aston Manor Urban District Council have received the sanction of the Local Government Board to the loan of 52,436*l.* for electric lighting, payable in twenty-five years. The committee will also recommend that the following scale of charges be approved for the supply of electricity for all purposes in the district, viz. 1*½d.* a unit for twenty-two hours a day, 6*d.* a unit for the remaining two hours; that the Council's tramway and electrical experts, with the surveyor, have advised them that the character of the district is not suitable for centre pole construction, and, in the circumstances, they have given instructions for the adoption of side poles, to include span wires, to be erected.

A REPORT on electric lighting and power for the Auckland (N.Z.) Harbour Board by Mr. W. G. T. Goodman has been presented, and states that electricity as a power for crane and capstan work is far more suitable than hydraulic or steam power, and estimates the number of lamps required at 40 arc lamps and 737 incandescent lamps of 16 c-p. He strongly recommends the direct-current system, and submits two sample systems. Taking all the circumstances into consideration, concludes the report, it would be cheaper for the board to obtain the power either from the City Council, if the latter erect a generating station, or from the tramway company if it will undertake the supply.

AT a recent meeting of the Wednesbury Town Council the Mayor proposed the adoption of a scheme of electric lighting, to be carried out by the Corporation in conjunction with an agreement which it was recommended should be entered into with the Midland Electric Power Company for the supply by the latter to the Corporation of electric energy in bulk for both power and lighting purposes. His Worship explained that the Corporation originally obtained a provisional order for the supply of electricity within the borough, but after taking the whole of the circumstances into account it was considered advisable to arrange for a supply from the company in question, and terms had been arranged which were satisfactory to both sides. This was a matter for congratulation, as it would enable the Corporation to supply the public at a reasonable rate. Mr. Davies said he believed Wednesbury would by this arrangement be able to supply electricity at a lower rate than neighbouring towns were able to do. The resolution was unanimously passed, and it was agreed to apply for sanction to a loan of 11,000*l.* to defray the cost of the work.

THE members of the New Mills (Cheshire) Urban District Council have had an important project before them. At a recent meeting Messrs. Rowcliffe & Co., solicitors, Manchester, wrote saying they were about to apply on behalf of an influential syndicate of local gentlemen for Parliamentary powers to erect electric generating stations and lay mains for the supply of electricity and power-gas throughout the district, comprising the county of Chester, the northern portion of the county of Stafford and the north-western corner of Derbyshire (including New Mills district) to the boundary of the Chapel-en-le-Frith Union, which was not included in the Derby and Notts Act. The area of the district is about 1,770 square miles, with a population of about a million and a half. Within this area there are four county boroughs, twelve boroughs, forty-four urban districts and twenty-eight rural districts. The scheme will be on the same lines generally as the Lancashire Electric Power Act, and the districts will join up to the districts of the Lancashire, Yorkshire, Derbyshire and Notts Act. The chief object of the company is to supply electricity and produce gas for power purposes, and although it would be prepared to supply local authorities with electricity in bulk for lighting and other purposes within their own areas, and, indeed, would be placed by the Act under obligation to do so if required at much cheaper rates than they could produce it for themselves, the company's business would lie in the directions heretofore practically untouched by local authorities. They asked for the co-operation and help of the Council in an undertaking which could not fail to be of great benefit to the district and place it on a par with other districts where similar undertakings will in due time be in full operation. Full details of the scheme would be supplied to the Council in due course and the Council deferred full consideration of the matter until those details are supplied.

## VARIETIES.

THE new Rise Carr Board schools, Darlington, were opened on Friday last.

THE new building erected by the Manchester Municipality at a cost of 300,000*l.* for the purposes of a school of technology, was formally opened by the Premier on Wednesday last.

BOLTON Hall, the seat of Lord Bolton, situate about 2 miles from Leyburn, in Yorkshire, was practically destroyed by fire on Wednesday night.

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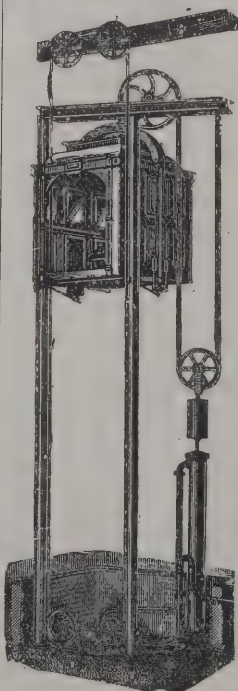
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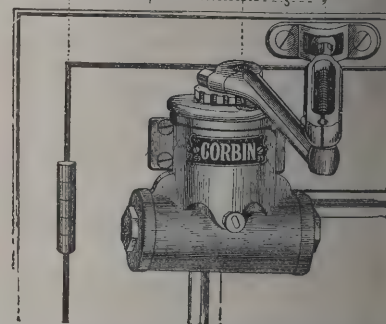
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THE bridge which has been erected over the Water of Leith by the Calder district committee of the Mid-Lothian County Council at a cost of 350*l.* was opened on Saturday afternoon.

A STACK of bricks at Messrs. Doulton's brickworks, St. Helens, collapsed on Saturday, and two men named Patrick Horan and James Knox, who were removing bricks, were killed.

A FINE new block of buildings erected by the Keighley Corporation at the corner of Cooke Lane and College Street, at an outlay of about 4,000*l.*, as offices, show and work-rooms for the gas department, have just been brought into use.

THE shelter erected by the church members and friends of All Hallows, in the churchyard adjoining the church in London Wall, for the people employed in the City arriving at Liverpool Street and Broad Street stations in the early mornings, was formally dedicated by the Lord Bishop of London on Saturday afternoon.

WE understand that a new theatre is to be erected in a very prominent position in the High Street of Colchester. It is to cost 1,100*l.*, and plans have been prepared by Mr. J. W. Start, architect of that town, and 54 New Broad Street, E.C., and building operations will be commenced almost immediately.

MR. ANDREW CARNEGIE visited Falkirk on the 10th inst. in connection with the opening of the new Falkirk Public Library just erected in Hope Street, towards the cost of which Mr. Carnegie contributed a sum of 3,000*l.* The library, which is expected to cost about 7,000*l.*, provides extensive as well as very convenient premises. The front building is two storeys in height, and the back one storey, with basement flat. The principal or street floor contains the reading-room, lending library, reference library, librarian's room, &c. The upper floor contains a recreation-room (which can also be used for lectures, &c.), lecturer's retiring-room, &c. In the basement are large work-room, staff-room, heating apparatus, &c.

MR. B. T. BATSFORD, of High Holborn, announces that a book entitled "Facts on Fire Prevention," edited by Mr. Edwin D. Sachs, and embodying results of investigations with fire-resisting materials by the Fire Prevention Committee will be issued towards the end of this month. The book, which forms two volumes of 220 pages each, profusely illustrated from photographs and drawings, deals with floor construction, partition construction, ceilings, window and door protection, all subjects of considerable immediate importance, both in respect to the practice of building in London and the various proposed

amendments in the Building Act and factory regulations. The volumes contain facts only, as distinct from views and criticisms, and the book is intended as a standard work of reference.

THE following candidates from the Midlands are among those who have passed the examination for the professional associateship of the Surveyors' Institution, of which body the first ordinary general meeting in the approaching session will be held on November 10:—Mr. Arthur Ward Ashton (Oswestry), who has also secured the Beadel prize in the examination; Mr. R. W. Brealey (Leek), Mr. R. C. Holbech (Bennett's Hill, Birmingham), Mr. R. B. Lees (Congleton), Mr. A. D. Orchard (Hereford), Mr. H. B. Owen (Newcastle, Staffordshire), Mr. L. E. Shone (Whitchurch) and Mr. H. O. Young (Rock Ferry, Cheshire); in addition to a number of non-student candidates, among whom are Mr. J. T. C. Hazledine (Shrewsbury), to whom have been awarded the Driver prize and the Penfold silver medal, Mr. A. E. Jones (Newcastle, Staffordshire) and Mr. J. E. H. Stooke (Danesmere, Herefordshire), Mr. R. A. E. Every-Clayton (of the Blackmore Park Estate Office, Hanley Castle) and Mr. Gilbert Pinson (of Corporation Street, Birmingham), it is announced, are among the professional associates who have qualified by examination for the fellowship of the Institution.

THE Glasgow Hippodrome—the latest addition to the amusements of that city—was formally inaugurated last week by a full-dress performance of the first programme, which has since been offered to the public. The hippodrome is situated in the Panorama Buildings in Sauchiehall Street, occupying what has been successively the stage of a panorama, a skating-rink and a variety theatre. Its chief feature is a sinking arena, the construction and dimensions of which are similar to the London Hippodrome. The ring by an elaborate mechanical contrivance can in one minute be converted into a huge lake of water. This is contained in a tank composed of steel boiler plates, which when full holds 100,000 gallons of water, rests on a framework of steel girders, and they in their turn are supported on dwarf concrete walls. Inside the tank is fitted a rising and falling platform constructed of eight steel girders, on which a teak wooden floor is laid. This platform, on which the performances take place, is raised by a powerful hydraulic ram capable of lifting 50 tons. The building throughout is lighted by electricity. Mr. James Miller, the architect of Glasgow International Exhibition, has carried out the numerous alterations required to transform the building to its present state.



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**BUILDING AND BUILDERS.**

THE memorial-stone of the overflow ward which is being erected at Kidderminster Infirmary by Mrs. William Adam, of Elderslie, in memory of her late husband at a cost of about £1,000, was laid on Monday afternoon.

AN extension of Covent Garden Market is about to be erected to accommodate the French flower market. It will be two storeys high and will be covered with a glass lantern light. The wrought-iron girders are being fixed and hopes are entertained that the building will be completed and ready for opening by Christmas. In architectural style and material it will harmonise with the other imposing departments of the market.

A RESOLUTION has been come to by the Central District committee of Stirlingshire to proceed with additions to the fever hospital at Bannockburn at an estimated cost of £4,014, exclusive of architect's fees, legal expenses, furnishings, &c. They have also agreed to apply to the standing joint committee for power to borrow £4,000 for the erection of the buildings.

THE ceremony of cutting the first sod in connection with the new water supply for Margate was performed on Friday last by the Mayor of the borough at the source of supply, Wingham. The undertaking, which will involve the laying of over twelve miles of main, and an expenditure of something like £100,000, and will give an unlimited supply of good water, has been for several years under consideration, but Parliamentary powers have only recently been obtained. Following the ceremony a large company were entertained by the Mayor to a luncheon at the Red Lion hotel, Wingham.

AT a meeting of the Aberdeen Town Council a report was submitted by the slaughterhouse committee recommending the erection of a public slaughterhouse at the Central Park at an estimated cost of £22,000. Strong opposition was offered on behalf of the residents of the Kittybrewster district, which, it was urged, would be injured as a residential quarter if an abattoir were erected there. Objection was also taken on the ground that railway facilities could not be procured. By sixteen votes to twelve the report was approved, and it was agreed to apply in next session of Parliament for power to borrow £30,000 to defray the cost.

THE foundation-stone of St. Margaret's Church, Dalton-in-Furness, was laid on the 11th inst. by Lady Evelyn Cavendish, whose husband, Mr. Victor Cavendish, M.P., is lay rector of

the parish. Up till quite recently service has been held in an iron structure, which has done duty for thirty-one years, but this has been demolished and a handsome building of stone is being erected in its place to accommodate 600 worshippers. The style is a simple rendering of the Early English or Lancelot period of Gothic architecture, in which ornament has been very sparingly used and good effect obtained by simple outline and proportion of parts. The architect is Mr. R. B. Preston, of Manchester. The cost of the new church is estimated at about £4,000.

AT Whitby the foundation-stones have been laid of a Methodist church and schools in Church Street. The new church will consist of spacious entrance vestibule, two staircases to the gallery, which will seat about 200 persons, the area on the ground floor also seating the same number, making the total accommodation about 400. The style is Classic adapted to the situation. The church, including the recess for orchestra, will be about 55 feet long by 34 feet 6 inches inside. The schoolroom behind the church will be 51 feet by 25 feet, and can be divided into one room 25 feet by 25 feet, with four classrooms 12 feet 6 inches square, by folding screens. The builders are Messrs J. Braim & Sons, Whitby, and the architect Mr. W. G. Smithson, of Leeds, while the cost will be about £4,000.

THE council of the Y.M.C.A. Association, Birmingham, are now going forward with the first portion of the scheme for the new premises, which are to be erected on the site of St. Peter's Church, Dale End. Tenders were received from fifteen firms of builders, and at the last meeting of the council it was decided to adopt the report of the building committee, recommending the acceptance of that of Mr. William Bishop, of King's Heath, at the sum of £18,977. The contractor has already commenced to demolish the church, and it is anticipated that rapid progress will be made. The foundation-stone laying ceremony is fixed for Tuesday, November 4. The first portion of the scheme, including the freehold site of 2,300 square yards, will involve an outlay of some £30,000.

THE Countess Beauchamp laid the foundation-stone at the Wyche, Worcester, of a new church. A site was procured near the present school chapel. Though it proved expensive, it was the only one obtainable, and upon this a church, which will accommodate some 250 people, is being erected. The building will command a magnificent prospect to the east, lying as it does high up on the side of the hill. It will be of substantial construction, but no money will be laid out in

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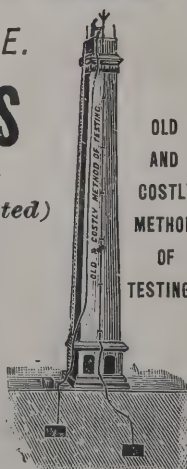
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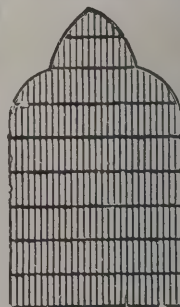
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expensive ornamentation. There will be a nave 73 feet long and 28 feet wide, with a small apse, separated from the nave by a chancel arch. At the south-west corner will stand a porch, and a smaller one at the north-east angle of the nave, close to which will be the choir, vestry and organ chamber. Owing to the great fall of the land eastward a considerable space is available under that end of the church, and this will form a vestry-room. The nave windows will be of the lancet type, and a three-light window is to be placed at the west end. The cost of the church will be about 3,000*l*.

At a recent meeting of the Stoke-on-Trent Board of Guardians, Mr H. M. Williamson (chairman) presiding, there was a long discussion with respect to the plans for the proposed alterations and additions to the workhouse, involving an expenditure of 32,600*l*. The Chairman moved a resolution embracing the adoption of the plans (which the Local Government Board had approved), the expenditure of the sum of 26,600*l*. and the borrowing of that sum, repayable within thirty years. Mr. G. Poole pointed out that the plans included costly roadways and extensive covered ways which were perfectly unnecessary, and he suggested that these should be eliminated. Mr. R. Cooper suggested that they should do away with the whole scheme, remarking that it would be a sin and a shame to spend all this money during the present state of trade. Mr. J. Coates (mayor of Hanley) said it would be a mistake in the way of extravagance to go on with the whole scheme. Mr. Coates moved as an amendment that, considering the high rates of the district, the guardians could not see their way to approve the plans which estimated an expenditure of 32,600*l*, and instructing the buildings and estates committee to consider the desirability of utilising the schools for male inmates and the erection of a new dining-room only. Mr. H. Emery seconded the motion. After prolonged discussion, Mr. Coates's amendment was carried by ten votes to seven. In reply to a question, the Clerk said the preparation of plans and other work done by the architect would cost from 700*l*. to 800*l*.

MR. R. DEANE SWEETING, M.B., Local Government Board inspector, held a meeting at the Town Hall, Maldon, Essex, on the 1st inst., to consider the application of the Maldon Joint Hospital Board to the Local Government Board for sanction to borrow 4,500*l*. for the provision of an isolation hospital. Answering the inspector, Mr. Bright, Clerk to the Hospital Board, said there was no opposition to the scheme, and Mr. J. C. Freeman, who represented the Rural District Council, stated there was

no difference of opinion on the subject between the two authorities represented on the Board. Mr Bright explained that the Joint Board was formed in 1901, and the district comprised the borough of Maldon and eighteen parishes of the rural district of Maldon. The Board consisted of nine elected members—five chosen by the Rural District Council and four by the Town Council, the chairman of the former and the Mayor of Maldon being ex-officio members. The Board's expenditure was divided into five-ninths on behalf of the Rural District Council and four-ninths on behalf of the urban authority. The total population of the Joint Board's district was 14,794, and the rateable value 42,880*l*. The site of the proposed hospital was situated in Broad Street Green, Heybridge, and contained about three acres. Details of the estimate were as follows:—Administrative block, 650*l*; ward blocks, for ten beds, 1,357*l*; laundry and disinfecting buildings, &c., 350*l*; well and pump, 200*l*; drainage, 200*l*; fencing and making-up drives, paths, &c., 50*l*; fencing and gates, 263*l*; disinfectory, 150*l*; ambulance, 70*l*; furniture, 150*l*; laundry fittings, 30*l*; site, 300*l*; architect and clerk of works, 285*l*; legal expenses, 150*l*; contingencies, 50*l*. Those figures came to 245*l*. less than the amount they asked permission to borrow. It was stated that the Joint Board had resolved that the site should not be used for smallpox cases, and they had agreed to purchase another site for a smallpox hospital for another 200*l*. Mr. P. M. Beaumont, the architect, then explained the plans, and at the conclusion of the inquiry the inspector viewed the site.

### PUBLIC WORKS IN ROME.

THE building crisis, by which the Italian capital was afflicted for so many years, caused during the past, says Mr. Consul Morgan, a partial suspension of some of the public works connected with the so-called Piano Regolatore, which is an official scheme for the carrying out of sundry necessary public works, such as the opening of new thoroughfares, construction of the Tiber embankment, building of several new bridges across the river, polyclinic hospital, courts of justice and sundry other works. Some of them, such as the embankment and the bridges across the Tiber, as well as various new thoroughfares, were duly completed; but the polyclinic hospital and the courts of justice, as well as the national monument to King Victor Emmanuel, had to wait for better times, which seem to have come at last, as work has lately been resumed with

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vigour. While the inhabitants of Milan, Turin and Florence contribute an average of 30 lire (1*l.* 4*s.*) a year, those of Rome pay 52 lire (2*l.* 1*s.* 8*d.*). One of the sources of municipal revenue is the so-called Tassa di Famiglia (family tax). This tax gave rise in the past to disputes between the municipal authorities and foreigners residing in Rome, many of whom claimed exemption on the ground of their foreign nationality. The regulations dealing with the family tax do not acknowledge such a privilege, as they hold that every inhabitant of Rome, whether he be an Italian or a foreigner, is liable to contribute his or her quota to meet the expenditure for municipal public services. A great many residents unfortunately forget that there are such things in Rome as taxes on servants, carriages, horses, dogs, &c., with the result that fines and endless trouble are incurred. They will find it cheaper to comply with local regulations.

The electric railway from Rome to Naples has given rise to interminable technical discussions; but, judging from the large number of firms who have applied for the concession, the scheme of linking two important centres like Rome and Naples by means of an electric railway seems not only to be feasible but worth undertaking. There is a large traffic of passengers and goods between the two towns. The intermediate villages will also greatly benefit, and it is foreseen that rapidity of communication and possible lower freights will attract to Rome a larger supply of foodstuffs from Naples. As the bulk of fish which is sold here is imported, an improvement may also be expected in that direction, as well as in the vegetable market. Passengers landing at Naples on their way to Rome would save three hours by taking the electric train.

The railway company that runs the trains from the capital to its suburbs, such as to Frascati, Marino, Porto d'Anzio, &c., have submitted to Government a scheme for the electric transformation of their plant. The building of several independent stations for these electric suburban lines is included in the scheme, and proposals have also been made to utilise the electric trams in Rome for the conveyance of passengers to the stations. By this means people may live cheaply out of Rome and come here daily to attend to their business, much in the same way as in London. It is estimated that the said scheme will involve an expenditure of 240,000*l.*

Another important projected railway line is the Central Umbria, connecting several large towns, such as Perugia, which is in one of the richest agricultural districts in the neighbourhood of Rome, with Terni, the seat of the chief iron

and steel works in Italy. The new line will open a large tract of country, whose supplies have up to the present had to be conveyed to the consuming centres by road. The scheme for this railway has met with great public favour, and as Government and the various municipalities concerned intend subsidising the line, there is every hope of its soon being built and opened to the public.

The need of direct communication between Civitavecchia, which is the outport of Rome and the inland central districts, has suggested the idea of a railway line from the coast to Orte. The Government and the various municipal authorities interested in the matter have promised to contribute yearly subsidies to its construction. British exporters of coal and pig and other iron, for the Terni works, will benefit by the new line, as there will be a direct conveyance of goods from the Civitavecchia pier inland.

The commendable ambition of those who are interested in the welfare of Rome, which is mainly directed towards the transformation of this hitherto consuming centre into a productive one, is gradually and steadily taking a more tangible form. Government, provincial and municipal aid is not lacking towards that end, and hopes are entertained that Rome may at an early date be able to vie in point of industry and commerce with her more prosperous northern sisters, Milan, Genoa and Turin. A few years ago the Italian capital was entirely dependent upon other districts for almost all her supplies, but with an increasing population, which has now reached about 500,000, and with the reviving general economic conditions of Italy, the old city was bound to take rank with other European capitals. Visitors who have not been in Rome for the last twenty years can scarcely recognise it. Suburbs have risen over the vineyards outside the city walls, old quarters have been superseded by large and commodious buildings; the Tiber is permanently embedded all along its urban course between two gigantic embankments on which fine houses, overlooking the river, have been constructed; solid granite bridges, meant to defy the ravages of time and the impetus of the once dangerous Tiber, have been thrown across the two embankments; new and wide thoroughfares have been opened; in one word the city has been completely modernised and rendered in all respects quite sanitary, as shown by the returns of mortality. These facts, coupled with the traditional courtesy of its inhabitants, render Rome a most agreeable and healthy sojourn. Extensive excavations have been lately undertaken by Government, especially in the area of the



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oman Forum, and the results have amply justified the expenditure and the labour involved in carrying out the plan of investigation proposed by the Archæological Department.

## THE INTERNATIONAL COMMITTEE OF STREET HYGIENE.

CONVENED by the chairman, Mr. H. Alfred Roechling, the International Committee of Street Hygiene met at Brussels on September 21 to 23 last, to arrange for the next International Congress of Hygiene and Demography to be held in Brussels in September of next year.

This committee, which was appointed by the last International Congress at Paris in 1900, and confirmed by the Belgian Government, consists of seventeen members representing England, America, Belgium, Holland, France, Switzerland, Germany, Austria, Hungary, Italy, Russia, Poland, Sweden and Norway, and is charged with the study of all questions relating to street hygiene.

As it became necessary to clearly define the scope of the committee's work, to adopt if possible general rules to guide sanitary or local authorities when dealing with important questions relating to the cleansing of towns, and to prepare the report for next year's Congress, the committee was convened, and met at Brussels as already mentioned, in the Salle d'Hygiène in the Belgian Ministry of Agriculture, which the Minister had kindly placed at its disposal.

Besides the Chairman, the following members were present at the Conference:—Lieut.-Col. E. von Kontkowski, Russia; Professor Dr. Pagliani, Italy; Mr. Van der Perk, Holland; Professor Putzeys, Belgium; Mr. E. Putzeys, chief engineer of Brussels.

In two lengthy sittings the committee discussed the material prepared by the Chairman, and adopted with some alterations the propositions submitted by him, which will in due course be laid before the next Congress of Hygiene and Demography.

The rest of the Conference was taken up with visits of inspection to some of the works belonging to the city authorities, such as the works belonging to the street cleansing department, the sewerage works, the waterworks, swimming baths and morgue. During these visits the construction and maintenance of the streets were likewise examined, and another feature of considerable interest was the laying of the conduit

system of electric traction near the Gare du Nord. On the Quai de la Voirie the members saw a fine refuse destructor of twenty-four cells that has just been erected by the Horsfall Engineering Company, and their best thanks are due to Professor Putzeys, Mr. E. Putzeys, the chief engineer of Brussels, and Mr. Alph Smeyers, the chief of the cleansing department of the city, who did all in their power to bring about the great success of the meeting.

## VENTILATION OF COTTON FACTORIES.\*

IN connection with the manufacture of cotton, in which Manchester is so largely interested, the dust difficulty is not absent, and has a large amount of intelligent attention bestowed on it. In the various departments of the industry prior to weaving, dust does not give much trouble, for the workpeople employed in them have ample cubic space, rising sometimes in mule spinning to 10,000, but in the blowing-room and in the card-room there are considerable amounts of cotton dust. But it is in the weaving-shed that dust has been most obtrusive, and has in combination with impurities due to respiration and combustion, excessive humidity and high temperature, proved hurtful to health. The excessive admixture of size with the yarn involves the emission, during the process of weaving, of dust and flocculent matter. Size consists of starch, china clay, tallow and various deliquescent salts, the principal one being magnesium chloride. The readiness with which these constituents diffuse themselves through the atmosphere varies considerably, so the composition of the dust as explained by Dr. Dupré is by no means constant, but roughly speaking, 50 per cent. of the dried dust is insoluble mineral matter (china clay), 30 per cent. insoluble organic matter (cotton), 15 per cent. soluble organic matter (starch), and 5 per cent. soluble mineral matter (chloride and sulphate of magnesium).

The amount of dust in the shed is determined partly by the amount of size used and the quality of the cotton, and partly by the character of the ventilation and the moisture of the air. The infusion of steam largely reduces the amount of dust, but that is still present to an undesirable degree and must bear some part of the blame of the high mortality of cotton operatives from respiratory diseases. Amongst textile opera-

\* From the address of Sir James Crichton-Browne, M.D., delivered at the Congress of the Sanitary Institute.

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tives cotton workers are the most unhealthy, their mortality figure from all causes being higher than that of occupied males generally by from 20 to 23 per cent, while from diseases of the respiratory system, exclusive of phthisis, their mortality is in excess by proportions varying from 53 to 65 per cent. Dr. Tatham tells us that "the workers in cotton mills suffer severely from the presence in the air of 'air' and 'flue' that escapes from the cotton, especially in the preparation of yarn," and he also comments on the mischief done to the air passages by the particles of size.

In dealing with cotton dust and with industrial dust generally the one universal and potent remedy is of course ventilation. In contending with certain special kinds of dust special appliances and arrangements are necessary, but for dust as a whole our aim should be to intercept and remove it at its point of origin and to insure a bounteous supply of fresh air, and many contrivances for this purpose, more or less efficient, are already in use. I might review the methods of ventilation now in vogue in factories and workshops and summarise the innumerable experiments in ventilation that have been tried, but in view of the fact that we are daily expecting a report from a thoroughly competent committee of experts appointed by the Home Office, that has been investigating the subject for the last two years, it would be presumptuous in me to do so. That committee was charged to inquire into the means of ventilation in factories and workshops, with special reference to the use of fans and the use and construction of respirators for the protection of workpeople exposed to dust or dangerous fumes, and there can be no doubt that its report will contain authoritative deliverances on these points. What is wanted is a code of precise definite instructions to be placed in the hands of a manufacturer who is required to provide fans, indicating the number, pattern, size, speed and position of the fans which will most effectively and economically secure the desired result, together with directions as to the number and position of openings into the outer air, and also a judgment on the physiological effects of existing respirators and proposals for the construction of one more convenient and trustworthy and less cumbersome than any yet known. It is to be hoped that the report will embody a clear statement of the scientific principles that underlie all ventilation, and will set forth for the guidance of inspectors in terms of carbonic acid, movement of air, amount and nature of fumes, dust or spray and hygrometric state, the conditions in which artificial ventilation is called for and the methods by which it may be made to co-operate with natural ventilation

and not to interfere with it. I trust also that the report will offer suggestions to architects for the construction of factories for many of these are now so built as to render impossible ventilation which should be a primary consideration in their erection.

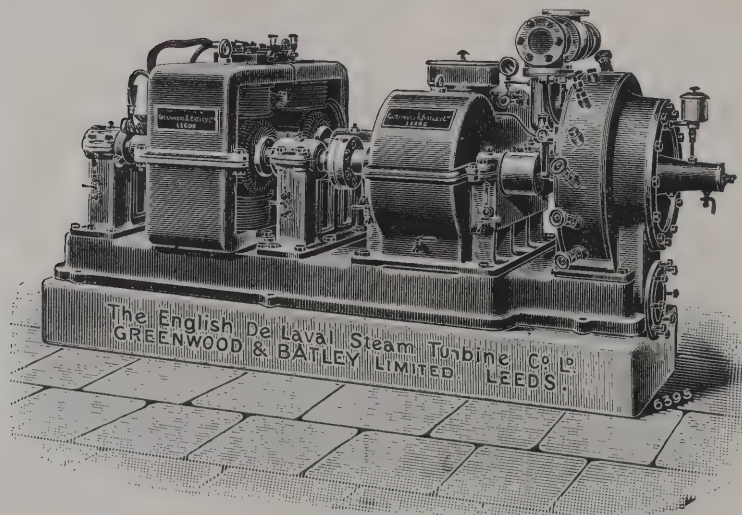
We may look forward, I think, to this report for a practical solution of the industrial dust problem, and the action which must be taken upon it will, we may confidently anticipate greatly reduce the death rate amongst many different classes of operatives, improve their health and augment their productive power. For improved ventilation in factories must be profitable to employers as well as to workpeople. The regulation of 1898 incorporated in the Factory and Workshop Act of 1901, setting up a standard of nine volumes of carbonic acid for every 10,000 volumes of air, has already, we are told, worked a complete revolution in the atmosphere of a considerable number of weaving-sheds, and has had a remarkably beneficial effect on the people working in them. "One effect of the greater purity of air," says Mr. W. Williams, inspector of cotton cloth factories, "is especially marked in summer when under the old conditions the impurity of the atmosphere coupled with the high temperatures reached in weaving-sheds led to frequent cases of faintness amongst the weavers. In well-ventilated sheds such cases have almost, if not quite disappeared. Further evidence in the same direction is furnished," Mr. Williams goes on, "by managers, many of whom testify to the improved health and increased vigour of workers. Some of the operatives in one shed, in which the ventilation had been much improved, volunteered the statement that they were less fatigued after a full day's work than they previously were in the middle of the day, and in other cases managers have remarked that the freshness of the weavers has increased with the freshness of the atmosphere in the sheds." One leading manufacturer, replying to inquiries by Mr. Williams, writes:—"The effect of the improved ventilation on the health of the workers has been good. We have had less staying away through sickness than before we had artificial humidity and ventilation in our sheds. The earnings have been more regular, but we do not find that they have increased as much as we expected, but the effect of the change has been advantageous to the manufacturer, the quality of the work being better and more perfect."

What more convincing testimony can there be to the hygienic and economical value of improved ventilation in relation to industrial dust?

# GREENWOOD & BATLEY, LIM

## ALBION WORKS, LEEDS,

## ELECTRICAL AND GENERAL ENGINEERS



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# The Architect.

## THE WEEK.

IT is easy for those who did not examine the designs in connection with the Liverpool Cathedral to find fault with the recommendations of the advisers, Mr. NORMAN SHAW and Mr. G. F. BODLEY. Out of consideration for the competitors the committee did not insist on the preparation of special designs for the building. But by their kindly action they opened the door to the entrance of many immature projects. According to the advisory architects, "One competitor sent a single plan, rather suggestive of the Albert Hall, the entire area being closely seated. In his report he said he had never built any buildings, and that he had been unable to prepare a design, as he had been ill. Another competitor submitted a large chalk drawing of a figure; a third, two photos of a brass lectern, and so on. There were many similar and many designs equally little to the point. We do not for a moment suggest that a man who can draw the figure could not design a cathedral, but we think the committee would desire to have stronger 'evidence of skill' in the direction of the work they required done. And when, for example, we placed the two photographs of the brass lectern in juxtaposition with thirteen large and carefully matured drawings of a cathedral, showing fine architectural skill and great knowledge in every line, we contend that we were right in our view that these threw far more light on the question to be decided than the lectern did." The advisers now say that they did not direct their attention to competitors who had prepared a special design and gave little care to the other drawings. The names and addresses of those competing were carefully concealed, and the designs were known by the numbers only. Messrs. AUSTIN & PALEY did not send in special designs, but the drawings of other churches by them were declared to be well designed and accepted as strong and decisive evidences of skill. Experience shows it is almost an impossibility to give general satisfaction in the selection of competition drawings. In the Liverpool case some surprise undoubtedly followed the announcement, but when it is said that the five sets of drawings show their designers to be capable men having considerable knowledge of old work, great care in design, and originality of a sound, practical nature, it is only fair to assume that the judges were competent and impartial.

THE changes which have taken place in recent times in Hungary are suggested by an incident which has recently occurred. A memorial of the legendary hero TŰHÜTŰM was subscribed for, and has been erected. The sculptor, JOHANN FADRUSZ, cut the inscription on the pedestal in the ancient Rune characters which were used more or less up to two centuries ago. The forms he selected for the letters were, however, derived from a manuscript which scholars consider to be a forgery. It has, moreover, been ascertained that the most exact Rune letters are illegible to the majority of the inhabitants. The sculptor was able to discover an old peasant who professes to be in a position to give models for the letters which could not be disputed, but he had to own that he knew only three people like himself who would be competent to read his inscription. In Hungary the Austrian language, or German, is superseding the tongues of the Slovaks, Croats, Wendians and others. The attempt to restore antiquity in an inscription is on that account a failure.

ONE of the bridges across the Seine leading to Notre-Dame is known as the Pont au Double. It received its name because the toll which had to be paid for crossing it was a "double," or two deniers. The old bridge was removed in 1848 and replaced by one which was not restricted to foot passengers. An approach to the bridge on the south side is known as the Rue Fouarre, which dates from 1202, and is closely connected with the history of education in Paris. At first it was known as the Rue des Escoliers. But in those primitive days the luxury of benches was unknown in the Quartier Latin. A student who did not care to be seated on the cold and muddy

earth was obliged to bring a bundle of straw every day. As he would not care to carry it back he cast it into the street. Straw was so abundant that the street was called Feurre or Fouarre, which was the old French word for straw, and it has preserved the name until our time. The great DANTE resided in the street in 1309, but whether he was compelled to carry as well as to peruse the straw is uncertain. The building in which DANTE listened to academic lectures was of the meanest; the rain came through the roof and the snow through the windows. Sometimes it was found to be preferable to deliver the lectures in the open air. The Rue Fouarre is mentioned by PETRARCH and RABELAIS. At night it was barred at both ends. In 1487 a chapel was erected in it, which existed until 1780. The privations which had to be endured by the students were not confined to the Quartier Latin. In most parts of Paris the elementary and other schools were commonly allowed to fall into a dilapidated state. The improvement in school building is to be credited to the Jesuits. Subsequently NAPOLEON ordered the erection of schools, but he did not believe it necessary that playgrounds should be attached to them. Under the Republican Government vast improvements have been introduced in schools, and those in Paris will bear comparison with any found elsewhere.

RARELY does a year pass without an announcement relating to DANTE'S house in Florence. It is, in fact, doubtful whether the modest building in a narrow lane was really the abode of the poet or of the ALIGHIERI family. There is more certainty about a house in Verona which one of the poet's descendants, who was an interpreter of VITRUVIUS, possessed. However, the Society for the Protection of Ancient Florence have petitioned the Communal Council of the city, and it is expected that the building will not only be purchased but restored. The building which has survived may be only part of the original mansion, and in it are two rooms which appear to be ancient. From some of the details it is assumed they belong to the thirteenth century. DANTE seems to have left Florence about 1313, and during the remaining eight years of his life he was either wandering about Italy or residing in Ravenna. In 1316 he might have returned provided that he asked pardon for his offences against the State. His great poem was never entirely published during his lifetime. As there was scarcely a city in Italy which he had not upbraided, if what he said were known it would not have been easy for him to find a refuge. According to GABRIELE ROSSETTI, the poet was a member of a secret society resembling modern freemasonry, and the Divine Comedy had therefore a meaning for the initiated. It would be fitting for DANTE'S residence to be public property, but if the affection of the Florentines is to take the form of a rejuvenated building it would be better for the house to remain as it is.

AT a recent convention of the American Society of Municipal Improvements it was pointed out that although the traffic in Paris, London, Berlin and other European cities was in excess of that in the busiest American thoroughfares, yet the pavements in Europe often outwore those of American streets. This was said to be due almost entirely to the manner of laying the material and of maintaining it. In the European cities the damaging effects of water were more carefully considered, and the insertion in specifications for city pavements of a clause providing for water absorption and damage tests was advocated. The results of tests showing the percentages of absorption of different paving materials, such as brick, trap rock, wood, asphalt, granite, &c., were exhibited, and the amounts ranged from 0.85 to 30.10 per cent., stones showing the least and untreated wood the greatest degree of absorption. The main cause of the difference arises from the control under which American engineers are obliged to work. They have, in the first place, to make a show of economy in order to sustain the reputation of the authorities who happen to hold office. They are also forced to utilise materials, regardless of their absorptive power, in order to favour contractors. In all such cases there is little use in contrasting American and English cities. The utmost that can be done is to draw comparisons with other American cities where similar practices prevail.





PAINTERS' ARCHITECTURE: PAUL VERONESE.

19701

## WATER-COLOUR SKETCHES AND STUDIES.

THE class of works known as "Impressionist" cannot be said to have gained the appreciation of English amateurs. The neglect probably arose from a belief that they were quickly produced. As they did not embody as much labour as the works which were familiar, people were likely to be chary about expending money on them. The principle, however, was accepted in other forms. Lyric poems, for instance, were admired in proportion as they were supposed to express momentary emotions. Impromptus in music were applauded. In the most important debates of the House of Commons a speech which was inspired by something accidental or unexpected was often more effective than an elaborated oration. In all those cases there is an assumption of a motive force within the composer, poet or orator which is restrained with difficulty, and can on the least opening become overwhelming.

In spite of objections, Impressionism is in that atmosphere which all true artists inhale. They have no longer any desire to pose as mysterious creators. The processes in all arts have been revealed, and everyone can employ them. It is known, for instance, that nature, although at one time supposed to be a hindrance to creation, has not lost her power of inspiration, and an artist's sketches can now be considered as testimonies of his reverence for the great monitor who can suit her lessons to all moods of men.

The majority of the seven hundred sketches by members of the Royal Institute of Painters in Water-Colours which are now on view are of the landscape class. The subjects are varied. It is needless to say that in many cases individuality seems to control fidelity of representation. Wherever they draw some members see opportunities for mannerism and turn them to account. Others try to resist the influence which long practice exercises on the faculties, and endeavour to suggest the peculiarities of a scene without adapting it to the customary ideal. Each little group, whether of eight or twenty drawings, will therefore repay examination, and indeed a longer time should be spent in the rooms than suffices for the ordinary exhibitions.

The hangers have placed Mr. CAFFIERI's drawings in the first place numerically. They are studies of waves and rocks, mussel gatherers and shrimpers. The figures, which recall old chromo-lithographs, are evidently French, and the "silvery" and "rose-tinted" shores are from the east side of the channel. The drawings are pleasing, for the sea in all appears in good-humour. Mr. AUMONIER has not renounced Sussex, although several of his drawings are taken from Norfolk. They have all the same strong handling, although at times it leads to spottiness. A *Wind-Blown Tree* is as characteristic as any of them. Mr. JOHN SCOTT utilises the costume of days when there were jesters and ladies who admired falcons. The drawings are elaborated, and the only reason for treating them as sketches or studies is their cheapness. We suppose all Mr. MACIVER GRIERSON's contributions are taken from the west coast of Ireland, for nowhere else in Europe is there such merciless employment of women as is represented in the *Harrow*. Two are dragging a primitive implement amidst difficulties which would test the vigour of oxen. The misery of the peasants' houses over which, as

TOM MOORE said, "two thousand years have rolled in vain," are also suggested. The *Liverpool Packet*, a steamer lying beside a quay, is the only object which is not suggestive of poverty. Mr. W. LANGLEY has only two drawings, and of course they are derived from Newlyn. Mr. R. B. NESBIT ranges from the North of Scotland to Venice with uniform success. The *Mussel Gatherers* is remarkable for the mystery which overcasts the scene and which is to be attributed to the effect of the clouds. Mr. H. J. STOCK's three drawings suffer from their neighbours. He has attempted scenes from the Book of Revelation. But BLAKE himself would not have ventured to illustrate the texts selected by Mr. STOCK. The contrast between Apocalyptic scenes and the delightful studies of chrysanthemums, wild roses, rose berries by Mrs. DUFFIELD, and the little folks by Miss DEALY, is almost enough to suggest the limits of the province of art. It is to be feared that many will prefer the humorous Dutch scenes of Mr. TOM BROWNE. It is no wonder the British are fleeced in Holland for we laugh a little too much at the inhabitants, and must pay the penalty. Mr. G. S. FERIER has also tried his hand on a Dutch windmill, but his English scenes are preferable.

Mr. HOBSON is versatile. His head of a girl might have been painted on ivory; his landscapes and seascapes are no less refined in treatment. Mr. E. G. WARREN has an admirable drawing of *The Incoming Tide*. His scenes in South Devon and Sussex are painstaking almost to excess. Mr. YEEND KING brings together a sea-view, the familiar Ramsgate Harbour, mountains as in Fehrleiten, a rustic bridge, an old red-brick house discovered on the Salisbury Road which merits attention, and other works. Hardly two are suggestive of the same hand. No one will be hypercritical with Sir JOHN TENNIEL's *Don Quixote*, although it is more suggestive of a portrait of some politician than of La Mancha's cavalier. There is no figure in the room so firmly drawn. It is sometimes difficult to decide whether the frames and mounts were not first prepared and the drawings adapted to them. Mr. MEYERHEIM's drawings are so lightly touched, they almost seem to merge into the materials enclosing them.

This time Mr. ARTHUR SEVERN restricts himself to Venice. He represents atmospheric effects as well as buildings. Santa Maria della Salute is shown under evening light, as well as on a showery day. One of the most interesting views is the *Evening Sunlight on San Giorgio*. The *Fishing-boat* is accurate enough, but it is a subject that requires air and surroundings. Mr. E. H. FAHEY's sketches have a peculiar air of completeness, as if nature had provided examples of landscape on a small scale instead of parts to be worked up. The two views of Hyères and the Berkshire scenes are especially worth attention. Mr. GORDON BROWNE's practised fingers have presented new and ingenious interpretations of the familiar rhymes about the *Bells of London Town*, such as "Oranges and lemons, say the bells of St. Clement's"—and a higher aim is revealed in his *Cassandra*. Mr. W. W. COLLINS has found excellent subjects which permit of warm colour at Rothenburg. Mr. HARRY HINE has been no less successful at St. Albans. Mr. DUDLEY HARDY of late has displayed how much can be done with single figures. His crowded *Press Gang and Return*, a vigorous drawing of people



on a quay watching a vessel, will therefore excite surprise. The humour of *Division of Spoil*, French sportsmen settling accounts in public, is irresistible. Altogether there is no lack of variety or skill. Mr. KINSLEY has a couple of views of Salisbury Cathedral among his collection. To Mr. JOSEPH KNIGHT the earth must always present a saddened aspect, and the small drawings are as characteristic of his style as those on a larger scale. There are no less simplicity and breadth and no less indifference to land in a cultivated state. Mr. J. S. CROMPTON shows monks and scenes in Cairo in his studies.

Mr. F. DADD has dispensed with highwaymen. His *Corinthian* is of a harder and more selfish type than PIERCE EGAN's hero, and contrasts with the burly *Bold Dragoon*, who is of the eighteenth century. Mr. JOHN WHITE once more utilises the West of England, and the views of Dartmoor are all expressive. The designs for the costume of players in "Paolo and Francesca" and "If I were King," by Mr. PERCY MACQUOID, have the definiteness which is desirable in such work. Mr. E. HAYES is always breezy and effective whatever may be the size of his seascapes. Mr. FINNEMORE has also drawn upon Holland for figures, and they are treated without any exaggeration. Mr. F. G. COTMAN avoids sameness, and his dozen of sketches vary as much in lighting and atmosphere as in aspect. The light-handedness of Mr. SAINTON is again exemplified in seven drawings. The *Solitary Firs* is more weird than one would expect, but the *Summer Melody*, *Evening* and *Wood Nymphs* have his customary grace of line, and it is to be hoped time will be gracious towards them. Mr. RHEAM has a vigorous study for the *Fugitive*, a princess hiding from mail-clad soldiers, besides views of the inexhaustible Cornwall. The colour system of Mr. J. R. REID is strongly marked in his sketches, and nature has to succumb to it. The coast scenes are like reductions of larger works. *A Gleam from the West*, by Mr. PEDDER, is an important work in which the effect of lighting on a hillside and a lake are contrasted successfully. Mr. FULLEYLOVE's industry is remarkable. He has no less than eighteen drawings, and they are mainly architectural. Several foreign countries besides England have supplied the subjects. The most elaborate is the *Great Avenue, Hampton-Court*. The artist is indifferent how often the subjects have been represented, for he contrives to emphasise some feature which imparts novelty to the view. Mr. CHARLES DIXON also is not afraid to attack London scenes. The view from the Hôtel Cecil, *Billingsgate*, *On the Embankment*, are remarkable. But is not the display of strange colours in the *Dispersal of the Fleet* in August last rather imaginative than historical?

Mr. BERNARD EVANS's bold transcripts are always welcome additions to the gallery. There is, no doubt, an apparent relationship between his English and foreign scenes, but few would care to cavil over the shortcomings of so strong an assimilative power. Mr. EDGAR BUNDY is another of the Institute's favourites. His humour rarely becomes extravagant. *A Sermon Perforce*, where the comfortable and secure parson holds forth from behind his garden wall to the culprit in the stocks, is more than a pictorial incident, for it is a satire on official but unsympathetic advisers of all kinds. Mr. G. C. HAITE's drawings reveal improvement in style. The President has drawn a girl in a *Vista of Teens*, and has condescended to allow her to be handsome. In *Before the Sitting*, a lady or model reading a paper, there is a surprising suggestion of reality besides absence of pose. Mr. CLAUDE HAYES has several views in which the large expanse of sky first claims notice. Mr. T. R. MACQUOID is one of the veterans of art, and he is as careful in details as if he were endeavouring to secure admission to a gallery for the first time. At one period he was supposed to be restricted to architecture, but he *Spring Evening after Rain*, *Tooting*, the *Burst of Spring*, the *Barber* and the *Beggar* and other works, denote his capability in figure and landscape. Many other drawings are to be seen, and, indeed, amateurs in quest of cheap and excellent works will find in the Institute Gallery an affluence of them, while students of water-colour art can derive many lessons from the walls.

A Statue of Voltaire is to be erected in Madrid, and the sculptor selected is M. Benelliure.

### THE ENCYCLOPÆDIA BRITANNICA.\*

THE sixth of the new volumes of the Encyclopædia Britannica abounds in biographical notices. Several painters are among the subjects, but by a remarkable coincidence neither architects (with the exception of Mr. JAMES KNOWLES) nor sculptors have any representatives among the names which begin with "K," "L" or "M," and form a series commencing with CHARLES KEENE and ending with WILLIAM MORRIS.

KEENE, it may be mentioned, after being articled to a solicitor, sought more congenial work in an architect's office, and while there he practised water-colour drawing in his spare hours. Afterwards he became an apprentice of a firm of wood-engravers. In December 1851 one of his designs appeared in *Punch*. His inventive power was not equal to his skill in representation, but Fortune is sometimes kind, and having become acquainted with Mr. JOSEPH CRAWHALL, "who had been in the habit for many years of jotting down any humorous incidents he might hear of or observe, illustrating them at leisure for his own amusement, these were placed unreservedly at KEENE's disposal, and to their inspiration we owe at least 250 of his most successful drawings." It is extraordinary how much success was attained by KEENE without any regular art training. His few etchings were as remarkable as his drawings on wood or for process blocks. According to M. BRACQUEMOND, "by the freedom, the largeness of their drawing and execution, these plates must be classed amongst modern etchings of the first rank." The reputation of CECIL LAWSON as a painter is restricted, but there are grounds for saying that he "restored to English landscape the tradition of GAINSBOROUGH, CROME and CONSTABLE, infused with an imaginative intensity of his own." His *August Moon*, now at the Tate Gallery, is enough to suggest the power of a man who died in his thirtieth year. The sketches of LEIGHTON and MILLAIS were written by the late Mr. MONKHOUSE, a ponderous official who was not capable to do more than repeat in a verbose manner the conclusions of earlier critics which had become commonplace. The stereotyped adjectives are occasionally varied by such fine phrases as "fresh little flowers of leisure" to signify sketches. Mr. WAUGH's article on WILLIAM MORRIS mainly relates to the poetic works. The position of the designer is expressed as follows:—

Essentially the child of the Gothic Revival he had put an ineffaceable stamp on Victorian ornament and design, his place being that of a follower of Ruskin and Pugin, but with a greater practical influence than either. In house decoration of all kinds, furniture, wall-papers and hangings (which he preferred to paper), carpet weaving and the painting of glass and tiles, needlework, tapestry, he formed a school which was dominated by his protest against commercialism and his assertion of the necessity for natural decoration and pure colour, produced by handwork and inspired by a passion for beauty irrespective of cheapness or quickness of manufacture.

All MORRIS's protests are now better understood. He was fortunate in being able to obtain extraordinary prices for his productions, and he was wise to keep to a market which he found to be profitable. But there was as much "commercialism" in his transactions as in those of the traders from whom he professed to disassociate himself. What he clearly lacked, says Mr. WAUGH, in life, no less than in art, was a direct and sincere sympathy with ordinary humanity. If he possessed that quality he would have appreciated the efforts of manufacturers and others who endeavoured to impart beauty to objects which had to be cheap. If MORRIS produced a piece of cotton he would demand as much for a yard as a trader would charge for a piece. The qualities of ALBERT MOORE, the figure-painter, who in any other country would have had his time monopolised by public works, are suggestively described by Mr. BALDRY in the following words:—

The main idea that governed Albert Moore's practice was a deliberate and intentional disregard of dramatic subject. In

\* The new volumes of the *Encyclopædia Britannica*, constituting in combination with the existing volumes of the ninth edition the tenth edition of that work, and also supplying a new, distinctive and independent library of reference dealing with recent events and developments. The sixth of the new volumes, being volume xxx. of the complete work. (Published by the *Times*, London.)



all his pictures, save two or three produced in his later boyhood, he avoided any approach to story-telling, and occupied himself exclusively with decorative arrangements of lines and colour masses. The spirit of his art is essentially Classic, and his work shows plainly that he was deeply influenced by study of antique sculpture; but he was not in any sense an archaeological painter, nor did he attempt reconstructions of the life of past centuries. Artistically he lived in a world of his own creation, a place peopled with robust types of humanity of Greek mould, and gay with bright-coloured draperies and brilliant-hued flowers. As an executant he was careful and certain; he drew finely, and his colour sense was remarkable for its refinement and subtle appreciation. Few men have equalled him as a painter of draperies, and still fewer have approached his ability in the application of decorative principles to pictorial art.

It will be regretted hereafter that works on a large scale by ALBERT MOORE are not to be seen. His decorative arrangements were generally of a small size. The Queen's Theatre in Long Acre, which was adorned by a frieze, has been demolished, and his paintings in churches are difficult to find. His brother, HENRY MOORE, R.A., was mainly known by his sea-pieces, which were always of an intense blue. There are also articles on the foreign artists, LENBACH (who was trained to be a builder), MANET, MARIS, MEISSONIER, MENZEL, MONET and MOREAU, and illustrations are given of their works and also of the English painters.

A revolution in connoisseurship was produced by the investigations of GIOVANNI MORELLI, who is the subject of an article. When he was elected to the Italian Parliament he obtained a commission to control the works of art which were declared to be public property, and he was appointed president. He soon found that much which was accepted as historical was on an uncertain basis. As he did not wish to wound Italian susceptibility he expressed his doubts in a German periodical under the name of IVAN LERMOLIEFF. Controversy arose about his conclusions, but as they were grounded on scientific principles instead of the vague opinions of experts, the victory was in most cases on his side. It was not agreeable, however, to have to abandon the belief that the *Magdalen* of CORREGGIO in the Dresden Gallery was in reality the work of a Dutchman, and that if judged by treatment of details in regular order, many other accepted masterpieces would not sustain a test. A disciple, Sir A. H. LAYARD, is also commemorated in the volume, but his claims to renown rest on his explorations in Assyria, of which the sculpture from Nineveh in the British Museum is the best memorial. It is needless to say many other articles are to be found which readers in general are likely to consider as more important than the biographies of artists.

Professor CASE treats of logic and metaphysics in their modern developments. It may to some appear remarkable that in the latter so decided a representative of physical science as WREN should be introduced. But MACH, who upheld a theory of "universal physical phenomenology" not unlike HUME's, claimed to have the support of NEWTON's third law of motion, "action and reaction are equal and contrary," which was derived from experiments by WREN, although the whole credit of the discovery is usually given to NEWTON. The law can be tested by observation of the senses, but in metaphysics there is no use for that power. Action and reaction, in common with all other phenomena, may be delusions. Professor CASE can see no future for metaphysics except by going back to the study of ARISTOTLE. TENNYSON believed that no one has yet succeeded in defining metaphysics, and before returning to the Stagirite it would be well to have a clear idea of what we expect him to supply.

The article on Libraries bristles with figures. As usually happens in the writings of officials, there is not a word which can be turned to account by architects. Yet librarians are loudest in complaining about the least shortcomings in the buildings they control. After so many conferences it was to be expected that some indications of the desirable arrangements would be forthcoming. Several other articles will bear analysis, such as those on Labour Legislation, Landlord and Tenant, Land Registration, Lighthouses, Metalwork, Miniatures. The prefatory essay is by Mr. A. BIRRELL, K.C., the subject being "Modern Conditions of Literary Production." The taste of the

English public in literature is suggested by one sentence:—"That very risible farce, 'Charley's Aunt,' has made more money than is represented by the united fortunes of SCOTT, THACKERAY and DICKENS." It is also stated that the authoress of "East Lynne" or her publishers might have drawn at least 50,000*l.* from Transatlantic readers if copyright had been arranged with the States.

The volume upholds the reputation gained by its predecessors as the most successful effort to popularise all varieties of knowledge in their latest state.

## BARKING AND EAST HAM.\*

IN old records the name of Barking is found as Breeching Bereking, Berkyng, &c.; now it is almost universally spelt Barking. Morant derives the name from the Saxon words Beorce and ing, signifying a meadow planted with birch trees, but other antiquaries are of opinion that it is derived from Burgh-ing—the fortification in the meadow. This latter explanation seems to be borne out by the fact that an "encampment" is still to be traced of the most extensive dimensions—being more than 48 acres in extent—on the north side of the town.

Barking, as was usually the case with parishes in which large monastic houses stood, was very extensive, being nearly 30 miles round, reaching up to the borders of Hainault Forest, on the north side of Chelmsford Road, and including the hamlets of Ilford, Chadwell, Aldborough Hatch and Barking Side. But most of these have been cut off and made into separate ecclesiastical districts. The advowson belongs to All Souls College, Oxford, to which it was given by William Pownset, of Loxford, who had been steward to the abbess.

Barking is in the Hundred of Brecontree, nearly eight miles from London, and is bounded by Eastham, Little Ilford, Wanstead, Woodford, Chigwell and Dagenham, in Essex, and by Woolwich, in Kent, a great part of the marshlands belonging to the last-named parish lying on the Essex side of the river. The parish contains 7,850 acres of cultivated land, of which about 1,980 are marsh land, about 300 cropped with potatoes, 250 upland meadow, &c. The soil is various—clay, gravel and loam.

In 1616 Samuel and John Jones had a grant from the Crown of the market-place at Barking, with the market-house built by Queen Elizabeth.

The small river Roding, which rises in the north part of the county near Elsinham, runs along the western boundary of the parish till it falls into the Thames. It is navigable as far as Ilford. In the fields adjoining to a farm called Uphall the circumference is to be traced of an entrenchment 1,792 yards in extent (*i.e.* 1 mile 32 yards).

Mr. Lethiullier thinks this entrenchment was too large to be that round a camp; his opinion therefore is that it was the site of a Roman town.

### Barking Abbey.

Barking Abbey, dedicated to the Virgin Mary, is said to have been the first monastery for women established in this kingdom. It was founded about 670 (in the reign of Sebbi and Sighere, kings of the East Saxons) by St. Erkenwald, Bishop of London, in compliance with the earnest desire of his sister Ethelburgha, who was appointed the first abbess.

The founder was the first bishop who sat in the see of London after the building of St. Paul's Church by King Ethelbert.

The charter of Hodelred, father of King Sebbi, is coeval with the foundation of the abbey, and undoubtedly genuine, and is still extant among the Cottonian manuscripts in the British Museum, and is one of the most ancient records of that nature.

In 870 the monastery was burnt to the ground by the Danes, and the nuns either slain or dispersed. It was rebuilt by King Edgar. In the abbey gateway, which we have seen, and which is a portion of the old abbey, although, of course (as may be seen), it has been restored, is a very ancient picture of the Crucifixion. The place was called the "Chapel of the Holy Rood Loft atte Gate;" now it is styled the "Fire Bell Gate" from a tradition that it contained the bell rung for curfew and for alarm of fires.

At the Conquest it (the abbey) was a place of note, having had several royal ladies for abbesses, and the Conqueror is said to have visited the place on his way to take up his abode at the Tower of London. From the gate of Barking Abbey also William is said by historians to have set out on his first royal progress through his newly-conquered kingdom.

\* A paper read by Mr. T. H. Alexander before the members, of the Upper Norwood Athenaeum.



The library of Magdalen College, Oxford, possesses a relic of the abbey in the shape of a beautiful French manuscript containing the Lamentations of St. Bernard, the Meditations of St. Augustine and a Life of St. Louis, presented to the convent by the Countess of Oxford, the wife of the twelfth earl of the old line of De Vere.

Amongst the privileges of the Abbess of Barking was permission to keep dogs for hunting hares and foxes in Essex. In those days ladies who took the veil, instead of immuring themselves in the cloister, often led a jolly, open-air existence, many of them becoming ardent sportswomen. One of the first treatises on hunting, hawking and fishing was written by Julia de Berners, prioress of Sopewell, near St. Albans, "a gentlewoman endowed with great gifts of body and mind." This Julia de Berners may frequently have been asked over to Barking by the abbess for a run with the "abbey hounds." On occasions when the fox took a southerly course they would cross the "two hides" belonging to the Abbot of Westminster. The abbot might, at the time, have been engaged in the pastime of hawking amidst the wild-fowl which haunted the river marshes. Apologies would be made to him, a few compliments would doubtless pass, and then, after exchanging notes with regard to the day's sport, the ladies would ride on.

The later history of Barking Abbey is somewhat uneventful. In 1376, owing to a breach in the river wall on the left bank of the Thames at Dagenham, a short distance east of Barking Creek, the abbey was flooded. The inundations recurred in 1380 and 1382, but, at considerable expense to the convent, works were at length undertaken which removed any further fear of trouble from this cause.

At the dissolution of the monasteries in 1539 the abbey surrendered to the Crown, and the demesne lands were leased by Henry VIII. to Sir Thomas Denny.

On the list of abbesses is to be found the name of Mary à Becket, sister of the Archbishop of Canterbury, and among illustrious personages who have resided there may be mentioned Eleanor, widow of the murdered Duke of Gloucester. When Catherine de la Pole, daughter of the Earl of Suffolk, was abbess, Edmund, Earl of Richmond (father of Henry VII.), and Jasper, Earl of Pembroke, sons of Owen Tudor by Catherine, the Queen-Dowager, were educated in the abbey.

Lysons gives a ground plan of the Abbey Church, Barking, taken from the ruins of the foundation in 1724, from a drawing in the possession of Mr. Ed. Hulse. Length, east to west, 170 feet; length of cross aisle, north to south, 150 feet; choir, 50 feet; width of church and nave, 22 feet; width side aisle, 11 feet; width cross aisle, 28 feet; diameter of bases of columns, 8½ feet; space between the columns, 22 feet.

#### *Barking Church.*

The parish church was dedicated to St. Margaret. In the chancel are two figures (in brass) of priests. The inscriptions have been removed. The church is large, comprising a nave, chancel and north and south aisles, with a tower at the west end. It was built chiefly in the fourteenth century, but its date is not at all clearly shown by its architecture, the tracery of its windows having been superseded by modern insertions. One portion of the church, including the piers between the nave and the north aisle near the eastern end, is Norman, and there are traces of Early English and Perpendicular work. It contains some fine monuments; the best and finest is in memory of Sir Charles Montagu, 1625, of Cranbrook, Essex (brother of the first Earl of Manchester), who is represented as dying on the field of battle, a page holding his horse at the door of a tent.

In the church were three chantries: one at the altar of the resurrection, in the north transept, and others at the altar of King Edward and the shrine of St. Ethelburgha.

It appears that the vicars of Barking were considered as part of the household of the lady abbess, and had a seat and a wife and fork (if forks were then invented) at the chaplain's table, their servants sitting "below the salt" with the domestics of the convent, but this right being found troublesome, because, as a document of 1536 explains, "the vicar, being the execution of his office among his parishioners, according to his bounden duty in that behalf, could not always repair to the monastery at the time appointed for meals or refectations, by reason whereof he was often disappointed of his meals; and that it was tedious and sumptuous for the abbess and convent to cause meals, drinks and other substances to be prepared at such extraordinary times and seasons as they should be driven by necessity to demand the same," it was therefore agreed that the vicar should be allowed 10*l.* a year to get his meals elsewhere. Even allowing for the greater purchasing power of money at that period, a fraction over sixpence a day seems a small sum to provide a vicar and his servant with both food and drink.

There are also among the monuments in this church one to Sir Crisp Gascoyne, Lord Mayor of London, who died in 1761. He is an ancestor, on the maternal side, of the present Marquis of Salisbury, much of whose property in the neigh-

bourhood is inherited through him. There is another to William Pownset, 1553. The signature of Captain Cook, the navigator, who married Miss Bates, of Barking, on December 24, 1762, may be seen in the register of marriages. Against the church wall outside is to be seen the following quaint inscription over a tomb:—

Stay here awhile, and his sad loss deplore,  
Here lyes the body of one Thomas More,  
His name was More, but now it may be said  
He is no more, because that now he's dead,  
And in this place doth lye sepulchered.

At the east end of the north aisle in the church is the tomb of Mauritius, made Bishop of London 1087. The parish register begins in 1558. There is a Quakers' meeting in Barking, and Mrs. Elizabeth Fry, of prison celebrity, is interred in the burying-ground.

Sir Christopher Hatton lived at Clayhall; he was cousin and at length heir to Sir Christopher Hatton, Lord Keeper of the Great Seal to Queen Elizabeth. There is an entry in the parish register, April 24, 1708, "Buried the Queen of the Gipsies."

#### *Greenstreet House.*

Greenstreet House, East Ham, commonly called "Anne Boleyn's Castle," now known as St. Edward's Catholic schools, is a large red brick mansion, supposed to be the site of the seat of the Nevills, whose tomb we have seen in East Ham Church. The most conspicuous feature of the building is a tower, called locally Anne Boleyn's Tower, from a tradition that that unhappy lady was confined in it. There are many legends connected with Anne Boleyn lingering about this fine old house. One is that the tower was built for her by her royal lover in the days of his courtship. The tale is told by an old writer that "Anne Boleyn was betrothed to a young nobleman, who died. About ten months after his death the king demanded her hand. She, as was the custom, requested to be allowed to complete the twelve months of mourning for her lover, to which Henry agreed, and for her amusement built the tower in question, from which she had a fine view of the Thames from Greenwich to below Gravesend." Lysons attributes no credit to the traditions of Anne Boleyn having been confined in this tower, as he thinks that it is evidently of more modern date.

That some one of wealth once possessed it, however, is proved by the fact that the room in the third storey was originally lined with leather inlaid with gold. A Mr. Morley, who lived in the house at the beginning of the nineteenth century, says that, according to a history of England which he had read, Henry VIII., on his suspicions being aroused with regard to her, had Queen Anne confined in the same tower in which five years previously he had courted her. From here she was taken by water down Ham Creek—which ran almost to the house—to Greenwich, and thence to the Tower of London.

In further support of the local tradition, Mr. Morley assured the writer of an article in the *Gentleman's Magazine* that he had himself seen a letter in the handwriting of King Henry VIII. dated from Greenstreet. Greenstreet House remained in Mr. Morley's family till 1863, when it was bought by Cardinal Manning and devoted to its present purpose.

#### *East Ham Church.*

Mr. J. T. Micklethwaite, in making a report upon this church some years ago, says:—"The churches near London have generally been so much altered and enlarged and rebuilt . . . to meet the requirements of an always growing population, that it was a surprise to find one of them still substantially in the form in which it was built over seven centuries ago. It has never been enlarged. No changes seem to have been made during the later Middle Ages, and comparatively few in more modern times. A church may have stood on this site from the earliest days of English Christianity, but the present one is very likely the first stone building. It was built about the middle of the twelfth century, and consisted of a nave without aisles, a rather large chancel, and a round-ended presbytery. All these are of one building, although the eastern parts were done first, as was the custom. There is some evidence of an intention to carry up the chancel as a tower, as was done at Newhaven, in Sussex, and elsewhere; but it was given up. . . . The work is good, and the wall arcades of the chancel and the arch towards the tower show more ornament than is generally found in country churches of the twelfth century, although the chancel arch and south doorway, the parts in which ornament is oftenest found, have in this case been destroyed. Early in the thirteenth century the south side of the presbytery was rebuilt in order to obtain a larger window above and a piscina and priest's door below. This position of the priest's door is uncommon. None seems to have been provided at the first building of the church. The south porch, which is now used as a vestry, is of wood,



and perhaps of the fifteenth century; but it is so covered up with plaster inside and out that it is impossible to speak with certainty about it.

"A special feature in the church is the early painting, traces of which remain in all parts. The walls generally have been blocked out with red lines, with scrollwork at the tops of the walls and on the soffit of the presbytery arch; and figures, some of them larger than life, on the wall-spaces between the original windows. . . . There is a little old painted glass. . . . There is a good marble font, dated 1639, which has been moved from its original place.

"In considering what should be done to the church, we have to think how we may preserve its historical record, which in this case happens to be an unusually interesting one; and also how to fit it for the decent performance of the Church's services."

Behind the communion table is a handsome monument to the memory of Edmund Nevill (styled Earl of Westmorland). There is a brass on the floor of Elizabeth, wife of Rd. Heigham. The earliest date in the register of baptisms, &c., is 1695.

The Rev. Dr. Stukeley, the antiquary, who was born at Holbeach, Lincolnshire, 1687, was buried here; but his grave cannot be recognised, as he directed that the turf should be made smooth over it. The register gives the date of his burial in the year 1765, on March 9. Among other subjects upon which he wrote is a treatise on "Gout."

At Great Ilford there was a leper hospital, founded by Adeliza, abbess of Barking. By the rules there was provision for thirteen lepers, and if one died another was elected to fill the vacancy. It was purchased of the Waldrons in 1739 by Crisp Gascoyne, alderman of London, the grandfather of Bamber Gascoyne.

Local tradition connects Eastbury House with the Gunpowder Plot. The usual underground passage is supposed to connect the house with Barking Abbey, to which it once belonged.

There also resided in this neighbourhood one John Fowke, who in the year 1686 bequeathed certain estates for the maintenance of eight boys in Christ's Hospital, two of them to be of this parish.

The whole district is fraught with interest, but in a paper suitable to the present occasion it is impossible to touch upon everything. I hope, however, that I have compassed sufficient to show how interesting the subject is, and in compiling this account of the places visited, &c., I must acknowledge my indebtedness, among other authorities, very much to "Lysons's Environs of London," published in 1796.

### THE ERECHTHEUM.

AN illustrated article on the Erechtheum, the most beautiful of the Ionic temples, appears in the *Architectural Record* of New York for October. It is by Mr. Edwards Gale. The following extract will serve to suggest the character of the description:—

Aside from the pleasure derived from a study of the portions of the Erechtheum as they are now found, exhibiting as they do the most varied, the most perfect and most beautiful architectural forms and decoration to be found in any single structure of antiquity, it is necessary to consider some of the main characteristics of the present structure in connection with its past.

An examination of the fragments of the west wall, which stood above the base course still remaining, proves that the fallen portion of the wall is of about the fourth century A.D., so that the wall as in general seen by Stuart and others, and as portrayed by them, is probably a reconstruction which took place when the temple was converted into a church. The Athenian inscription mentions no windows, and the attached columns which are referred to are those of which the bases remain, which are of the original workmanship. Judging from traces on the wall and from the manner in which the string-courses are cut off square, and the channel in the antæ, it is apparent that some structure was originally built against that portion of the wall, and the arrangement and traces of the steps indicate two levels at that end, probably a small court or garden.

Considering the general condition of the south wall, it appears especially fortunate that, as some part had to suffer, it should have been chiefly the expanse of plain wall rather than the Portico of the Caryatides. From many indications, the chief of which are that the stones of this portico are merely let into the main wall of the temple, and except one stone of the west side form no integral part of it, a method quite contrary to usual Greek work, it is believed that this portico was not part of the original design, but was the immediate substitute of some more simple structure, yet of a date nearly or quite corresponding to the rest of the work.

Of the six caryatides, five remain in their original position. The second one from the south-west corner, removed by Lord Elgin and sent to England in 1812, and later acquired by the British Museum, is now replaced by a copy in terra-cotta. The inner caryatid on the east side of the portico is the one that was missing at the time of Stuart's visit, but it was later set up, and somewhat restored.

These figures, being substitutes for columns, were treated with great simplicity, the posture being varied only in that the three figures to the west rest on the right and the others on the left leg.

That the position of the hands and arms may have slightly differed is probable, but unfortunately none now remain whole, all being broken somewhat above the elbow. Although the faces are marred and the long tresses which fell on the shoulders are broken, the beautiful contour of the head, with the masses of hair drawn back from the brow, leads with a gentle blending to the capital which intervenes between the figure and its great burden. The folds of the diploidion concentrated in depth of shadow between the breasts give an effect of strength on a central axis, and below the drapery falls directly to the base, giving a powerful vertical quality in the lines. These figures are classed with the best sculptures, but there are parts executed with much less exactness than would have been found during the height of Pheidias' purity. The cornice over the caryatides, fairly preserved in parts, is badly worn away at the top, and excepting a small fragment on the north-west end, the upper cymatium, carved in egg and dart and interspersed with lions' heads, traces of which are discernible, is entirely gone. A large section of the flat panelled ceiling has fallen. The entrance to the portico is a small opening cut through the podium; the level of the floor inside being a trifle higher than the upper step, a short steep-stairway, traces of which remain, led down to the door giving access to the western section of the temple.

On the north side of the Erechtheum the level is about 10 feet lower than on the south; the portico on this side, the most perfect work imaginable, so long used by the Turks as a magazine for military stores, was finally freed from the screen-walls in 1846.

It is here that the effect of the high Greek steps becomes very apparent. That the steps were proportioned for architectural purposes and not for ease of ascent is certain, and by them the lines of the cornice are admirably counterbalanced and the effect of the columns greatly increased. No curve such as exists in the Parthenon has been observed in these steps. The intercolumniation of this portico is the widest allowed to stone temples, a peculiarity being that the central interval is less than the outer. In connection with the difference of spacing in the columns of this and the eastern portico the vast difference in the proportion of the columns themselves should be noticed. The entasis of the columns of the northern portico is one of the most delicate curves ever applied to a structural form. The axes of the columns are not perpendicular, but incline inwards at a uniform angle, and the corner columns, as in other Greek temples of the best period, have a slightly greater diameter than the others. The capitals of these columns form the most beautiful example of decorated Ionic capitals found in Greece; although all are now somewhat destroyed sufficient remains to show their perfection in form and detail. Beside the spirals of the volute runs a deep square sinkage, from which metal fastenings or traces of them show in every capital; and it is more than probable that these square sunk spirals were filled with strips of bronze and that the central eye contained a rosette of the same metal. It will be noticed that over the egg and dart the circles of the platted band are cut very deep. These were filled with coloured stones. The columns although much defaced are standing entire, except the one at the north-west angle; the upper part of its capital and a fragment of the volute are on a stone near the portico, and a small portion of its necking is in the museum on the Acropolis. Much of the entablature that is not in position lies scattered about on the ground near the portico, and many of the best examples of the carved ornament may there be examined. The plain frieze is of dark Eleusinian stone, and the remaining fragments show numerous sinkages and metal dowels irregularly placed to support the figured frieze. The figures supported by these metals were sculptured in white marble. All the fragments now remaining are in the museum on the Acropolis, and consist of only forty-eight small and broken pieces.

Amongst the fallen masses near the portico is a stone which appears to have formed the central block of the tympana. The angle is  $14^{\circ} 5' 6''$ . All but a small fragment of the inclined corona and cymatium is missing. This fragment may be seen in the museum on the Acropolis. Its workmanship is very fine, but the piece unfortunately small.

The flat ceiling of this portico was mostly destroyed by the siege of 1826, but one entire section remains in place; many of the minor parts are scattered about on the adjoining ground. The plain mouldings show traces of colour, and the centre of



each panel appears to have been filled with a bronze ornament. The only painting used on the exterior of the Erechtheum appears on the ceilings of the porticoes—a decorated egg and dart on the plain mouldings and a Greek fret on the flat soffit outlined between the lines of beading.

The great doorway of the northern portico, although mutilated and somewhat reconstructed by the insertion of jamb linings, still shows its extraordinary beauty of proportion and detail. The small plain doorway near it originally led to the enclosed court on the west side of the Erechtheum. Below the pavement of this portico may be seen the rock struck by Poseidon.

Of the six columns of the eastern portico, five remain in position, the other one being in the British Museum, having been sent to England in 1812 by Lord Elgin. The ceiling and entablature is much more damaged than on the north, and the detail is simpler and not always so perfect. The stones forming the pediments at the east and west ends appear to have been destroyed. That the pediments were nearly completed in 409 B.C. is shown by the Athenian inscription. Marble roof tiles and acroteria have been found in considerable quantity, but, although some are of exceptional form, the workmanship does not indicate that they are contemporary with the original work of the Erechtheum.

### GLASGOW TECHNICAL COLLEGE.

THE opening meeting of the session of the Architectural Craftsmen's Society was recently held. The presidential address was delivered by Mr. C. Ernest Monro. At the outset, reference was made to the progress and work of the Society since its institution. Thereafter he proceeded to read a paper entitled "Materials: some Misuses and Limitations." The "lamp of truth" was strongly emphasised, and the importance of practical knowledge of the nature and capabilities of materials with regard to their individual uses and adaptabilities for express purposes and treatment in construction. A vote of thanks was accorded the lecturer, and attention was called to the conditions of prize offered by Mr. P. Macgregor Chalmers, architect, for the best essay on the subject of "New Buildings in Glasgow and their Methods of Construction." During the session papers will be read on "Art as a Teacher," "The New Teaching Regulations," "Early French Renaissance Architecture," "Roof Tiling," "Fireproof Construction," "The Minute Structure and Methods of Distinguishing the Species of Woods," "Ironmongery," "Construction of Timber Staircases," "Leaded and Stained Glasswork," "Planning and Construction of Burgh Buildings," "The Glasgow Mode of Measurement."

### LUXULYAN CHURCH.

THE parish church of Luxulyan now possesses, through the liberality of Mr. Silvanus Trevail, a peal of six bells. Three have been recast and three added. Messrs. Gillett & Johnston were the founders. No. 1 (treble), note F, is 26 inches in diameter and weighs 3 cwt. 3 qrs. 21 lb., and is inscribed:—"These bells were recast, rehung, and three added at the expense of Silvanus Trevail, F.R.I.B.A., in honour of his parents, John and Jane Trevail, of Carne, in this parish, A.D. 1902." No. 2 bell, note E, is 27 inches in diameter and weighs 3 cwt. 3 qrs. 14 lb., and bears the names of R. Sinclair Kendall, vicar; Colman B. Rashleigh, Bart., and Samuel Edwards, churchwardens, A.D. 1902. No. 3 bell, note D, is 28½ inches in diameter and weighs 4 cwt. 1 qr. 10 lb. It is inscribed:—"DE. 1722 I C. VIC. TP. WR. May God bless this parish and its people. A.D. 1902." No. 4 bell, note C, is 30½ inches in diameter, weighs 5 cwt. 0 qr. 21 lb.; inscription:—"R.G. n 1666. On earth peace, goodwill towards men." No. 5 bell, note B, is 34 inches in diameter, weighs 7 cwt. 1 qr. 14 lb., and is inscribed:—"1684. I was recast in the year when H.M. King Edward VII. was crowned. God bless the King, A.D. 1902." No. 6 bell, tenor, note A, is 37 inches in diameter, and is inscribed:—"John Cole, vicar; Philip Harris, John Harris, W. Pennington. 1764. Vivos Voco: Mortuos Plango: Pulgura Frango. A.D. 1902."

Mr. Trevail has also erected a churchyard cross in the style of the old Cornish Celtic crosses of the ninth and the tenth centuries. Cornish granite is used and the design, in which Rev. W. Iago, of Bodmin, gave assistance, is based on that of the six best examples in Cornwall, namely, St. Neot, Cardinham, St. Mabyn, Lanivet, St. Columb and Padstow. It was executed by Messrs. John Evans & Son, of Bodmin.

The following address was presented to Mr. Trevail on the occasion of the dedication:—

"On this the dedication day of your munificent gift to your old parish church of the enlarged and reconstituted peal of bells, a day when again from the tower 'sounds aerial seem to float,' will you allow the parishioners of Luxulyan to most

heartily thank you. The name of Trevail has been associated with the parish of Luxulyan for so many generations that nothing is needed to perpetuate it in our midst, but in accepting the bells at your hands we have done so as a solemn trust, as strengthening the tie of associations with the giver, and chiefly because we recognise the good effect which will be induced by the sweet sounds of our church bells, not only on our own minds, but also on those of generations yet unborn.—R. S. Kendall, vicar; Colman B. Rashleigh, Bart., Saml. Edwards, churchwardens, on behalf of the parishioners of Luxulyan."

### MUNICIPAL BUILDINGS, ST. IVES.

THE property and plans committee of St. Ives Town Council have considered the letter from Mr. E. Hain, M.P., offering to present to the town a site near the parish church for the erection of municipal buildings. The borough surveyor has prepared a plan showing the available space for the erection of a block of buildings to contain guildhall, council chamber, jury rooms, public hall, town clerk's, surveyor's and treasurer's offices, muniment-room, parochial offices, mayor's parlour and fire brigade station and office, and the Council have decided to submit the same to Mr. Hain for suggestions or approval; to instruct the town clerk to obtain from boroughs recently provided with municipal buildings particulars of such buildings and the cost of them; to advertise for a set of competitive plans and specifications for the block of buildings, to cost about 6,000*l.*, and to offer premiums of 70*l.* to the architect whose plans and specifications are accepted, and 30*l.* to the architect whose plans and specifications are considered by the committee next in order of merit.

### STEEL WITH CONCRETE.

IN a recent communication to the Paris Académie des Sciences M. Considère describes a series of valuable experiments carried out by a commission appointed by the Ministre des Travaux Publics with a view to ascertaining the precise rôle played by the metal in ferro-concrete constructions. According to an abstract of the report in *Engineering* the specimens tested by the commission were generally 6'56 feet long, and had a cross-section 3'94 inches square. Each of these concrete bars was reinforced at the corners by four steel rods, having a total section of 1'77 square inches. The concrete employed was made by mixing 661 lbs. of Portland cement with 1'04 cubic yards of gravel, passing a '98-inch screen, and '52 cubic yard of sand, passing a '19-inch screen. It was found that in setting the contraction of the concrete gave rise to an initial compression in the steel reinforcement amounting to 2'86 tons per square inch of the metal. The corresponding tensile forces simultaneously called forth on the concrete amounted to 74 lbs. per square inch. Tested in tension it was found that the specimens stretched rapidly until the stress on the concrete was practically equal to the ordinary tensile strength of this material. From this point the tested bar stretched much less rapidly, and throughout this period the tensile stresses in the concrete remained constant, the whole increase of load being taken by the iron bars. It follows therefore that during this period the elastic modulus of the concrete was zero. In one case the test-bar was subjected to a stress of 292 pounds per square inch of cross-section, under which the total extension of the specimen was '024 inch. The reinforcing rods were then cut out, and the + - shaped bar left was then tested in cross-breaking, and, in spite of being somewhat injured in the cutting out of the reinforcing bars, only failed under a calculated stress of 128 pounds per square inch. Summing up, M. Considère states that concrete-steel submitted to tension acts precisely as ordinary concrete, so long as the tensile stress does not exceed the usual breaking stress of ordinary concrete. Under higher stresses it will support without breaking extensions which, in the case of specimens hardened under water, have been as great as 1-500th the total length, and in the case of air-hardened concrete have ranged between 1-2000th and 1-850th of the total length. When the concrete-steel is stretched beyond the usual elastic range of ordinary concrete, the tensile stress on the concrete remains constant up to the ultimate breaking-point, the whole of the additional load being taken up by the metal. When subjected to repeated tensile stresses, however, the fraction of the load carried by the metal tends to augment, and that of the concrete to fall, until ultimately the working stress on the concrete is only 70 per cent. of its original value. If, finally, after a series of loadings and unloadings, the maximum load is raised 30 per cent., the concrete again exerts a tensile resistance equal to its primitive value. It may be added that the modulus of elasticity in compression of a concrete-steel bar is reduced on stretching the latter.



## NOTES AND COMMENTS.

THE Board of Manufactures in Edinburgh has for a long period fostered industrial art and technical education in Scotland. At one period it was the only institution of its class in Great Britain, but one of the indirect effects produced by it has been the creation of other bodies who profess to be more vigorous and more in keeping with the modern spirit. The title, perhaps, is not sufficiently explicit, and does not express all that has been done or can be done by the Board. The Government have therefore been compelled to institute an inquiry into the position of the Board of Manufactures. The occasion has been seized by the Royal Scottish Academy to make an effort to become free of the tutelage of the Board, and it is possible there will be other imitators in the revolt. Every one who has visited Edinburgh is aware that there is a joint occupancy of the low temple-like buildings in Princes Street. The Board of Manufactures and the Academy with the National Gallery are in one. The Scottish Academicians propose that the building, instead of being jointly occupied, should be assigned to the Board of Manufactures for the paintings and other works of art known as the National Collection, while the Royal Scottish Academy should obtain possession of the Royal Institution, which is used as a museum of antiquities, a drawing school and offices for the Royal Society. At present, it must be acknowledged, the building available for the Academy is not adapted for such annual exhibitions as are desirable. The building in Trafalgar Square in its worst days was far more satisfactory. What is to become of the Society of Antiquaries and the Royal Society, both important bodies, is not clear. But they are each well capable of guarding their own interests. The Scottish people are likely to see grounds for the changes; but when the Academicians insist that they should be emancipated from the duty of teaching, there is sure to be general disapproval. The purpose of academies of art throughout Europe comprised teaching. We need only refer to the English practice. The academies which preceded our Royal Academy, and were independent of support from the State, recognised the necessity of teaching, and it might be said that teaching formed the basis of the institution founded by GEORGE III. The Royal Hibernian Academy, although always in a state of poverty, does not neglect attention to students, and the Scottish Academy has also rendered services in that way, although of late years the instruction has been grudgingly given. If the artists will not do something in return for the possession of a Government building, why should it be made over to them for the glorification of the members?

THE destruction of the Hôtel de Ville in Paris was so complete, there are very few relics left of the splendour which gave *éclat* to the interior of BOCCADOR's building. The most important reminder is to be found in the Château de La Punta in Ajaccio. It is a sculptured representation of the four seasons under the appearance of four children. They are placed near a globe which is surrounded by signs of the Zodiac and sustained by four dolphins. The group is the work of DEBAY, the sculptor, and belonged to a fountain which was placed under the escalier of the Cour Louis XIV. DEBAY's name is almost forgotten, but forty years ago he held an important position among French artists, and his amorini especially were judged worthy of admiration. It is remarkable that his work should have escaped the flames of the Communists. The group found its way to a marble-worker in Paris, who restored it, and it was afterwards sold to a Corsican gentleman.

WHEN the excessive tariff on works of art entering the United States from Europe was first imposed, it was intended to serve the interests of American artists. So long as it was thought to be fashionable to have a gallery filled with examples of modern French paintings, for they were chiefly in favour, native art was never likely to flourish. Americans might study in Paris and set up ateliers, but there would be no improvement in the system of patronage. French artists, finding that people began to hesitate more and more about paying 20 per cent. on the value of their pictures, have got over the obstacle by taking occasional visits to New York, Chicago and other places, where they execute works which bring in high prices. The

number of French paintings which are found in Chicago is incredible. Even at the hotels valuable foreign pictures and statues are to be seen. The American artists now find there are two sides to the account. They have secured temporary protection, but the works of old masters, which it would be an advantage to study, are withheld from them. When they learn that purchasers like Mr. PIERPONT MORGAN retain their costly acquisitions (the estimated value is 6,000,000*l.*) in England on account of the tariff, and are lending them for exhibition to London and the provinces, they can realise at length that all is not gold which glitters. The mere fact that works of art are classed with mechanical productions by Custom-house officials must also have an injurious effect by inducing men to look on them as no more than a variety of manufacture. If the artists could exercise control, the tariff would be suspended or materially altered.

AN International Engineering, Machinery, Hardware and Allied Trades Exhibition will be held at the Crystal Palace in the spring of next year. It will have the benefit of the patronage of Lord KELVIN and many other important personages connected with engineering and allied trades. There is every indication that the exhibition will be a success. The general manager is Mr. HENRY GILLMAN, who has had much experience in similar enterprises. Among the sections are sanitation and ventilation, electrical engineering, woodworking, art metalwork, heating and lighting, builders' ironmongery, marble and enamelled slate, tiles, safes and strong-rooms, oils, paints and colours, architectural ironwork, furniture, &c. The Crystal Palace is well adapted for exhibitions of the kind.

THE courses of lectures in the Ecole des Beaux-Arts, Paris, began on the 16th inst. The following are the courses and professors:—Ornament, M. D'ESPOUX; Mathematics, Dr. BOURLET; Descriptive Geometry, M. PILLET; Stereotomy, M. MARCEL LAMBERT; Physics, Chemistry and Geology, Dr. RIBAU; Construction, M. MONDUIT; Perspective, M. JULIEN; Building Law, M. MULLET; History of Architecture, M. MAGNE; History of French Architecture during the Middle Ages and Renaissance, M. BÆSWILLWALD; Theory of Architecture, M. GUADET. In addition to the above special courses, there are courses of General History by Dr. LEMONNIER, and of Literature by Dr. ROCHEBLAVE, which are common to architects, painters and sculptors. All the students are also eligible to attend the courses on Design, by M. JOSEPH BLANC; Modelling, by M. ALLAR; Elementary Architecture, by M. BÉNARD; and Decorative Composition, by M. MAYEUX.

THE late Mr. STOCK's treatise on "Shoring and Underpinning" (London: B. T. BATSFORD) is destined to hold a place in architectural literature not unlike that assigned to Mr. WELLS's treatise on "Dew" in scientific literature. Although devoted to a special, and it may be a humble subject, the principles introduced are those which have the widest application. Timber construction especially is exemplified in the proportioning and arrangement of shores to resist the forces brought against them, and which lead to tensile as well as compressive strains. As a rule, old houses used to be propped by the aid of empiric rules, but the dimensions of beams can be ascertained by calculation as readily and as accurately as other parts of structures. Mr. FARROW, in preparing the third edition, has refrained from altering any considerable portion, but he has substituted the provisions of the London Building Act of 1894 for those of the Act of 1885, which were in force when Mr. STOCK lived. To a great extent the book may be accepted as a treatise on the mechanics of construction, while shores will be found far more easy to understand than the ordinary diagrams.

## ILLUSTRATIONS.

MORTIMER HOUSE, EGERTON GARDENS, SOUTH KENSINGTON.

HOUSE AT ASHFORD.

TEA-ROOM, INSTITUTE OF MECHANICAL ENGINEERS.

BURLINGTON MANSIONS, CORK STREET W.

NO. 64 SLOANE STREET



## THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Association was held on Friday evening last, Mr. H. T. Hare, president, in the chair.

Mr. C. H. BRODIE, in proposing the adoption of the annual report and balance-sheet of the last session, said the one fresh point brought to notice was the gratifying account of the day school.

Mr. FRANCIS HOOPER, who seconded the proposal, said in the matter of success the figures spoke for themselves. It was only necessary to point out that the increased expenditure in various details was the result of more classes. The staff work had increased in proportion, and they had therefore to be prepared to expend more money than they had done in the past. In many departments the increase was simply due to progress in their work.

The following were elected members:—Messrs. C. G. Hare, H. C. Ingram, W. Paul, A. S. W. Mackay, H. J. Scott, A. T. Groves, R. M. Butler, A. N. Prentice, S. I. Adams, W. J. Feare, S. Ford, T. W. Fullerton, R. C. Foster, H. H. Whittington, N. A. F. Haslewood, E. R. Nixey, R. Tasker, M. E. Webb, E. J. Whitley, F. E. Whiting, A. C. Withers, J. W. Waite, G. Vey, W. N. Couldrey, B. Chaikin, A. A. Hands, W. T. Temple, Alan Binning, H. Reaney, A. M. Millwood, P. O. Dunk, C. Gascoyne, S. W. Hill, J. R. Osborn, M. R. Martin, P. H. Topham, E. F. Ferry, A. E. Munby, A. Horsnall, G. F. Royds, T. C. Pope, C. M. Harris, T. S. Atlee, W. G. de M. Wilkinson, J. H. Markham, L. Cahen, C. A. S. Vardy, W. Whymper, W. K. McDermott, G. D. Clunies Ross, G. G. Sigismund, L. Morgan.

Mr. T. R. SPENCE read the following paper, entitled

## Homer and Architecture and the Crafts.

The aim of this paper is not to enter into vexed questions of archæology or the latest discoveries relating to archaic art and their relation to the life of Homer.

It is more in the nature of a fairy journey with him, noting the delicate and subtle suggestions on architecture and the crafts which interlace the expression of his joy in battle, and the lovely sea and land in which is set the story of his characters. He was the seer who "dipped into the future and saw the wonder that would be," for, we may take it, the art he described was more in the sense of a vision of its fruition. He gave in literature what Phidias gave in marble and metals. May not archaic work be the strenuous childhood of effort to materialise the conception of the seer? and only when Phidias came did his ideas reach their permanent ripeness and fulfilment.

How well he has suggested in the Odyssey a broad conception of architecture in speaking of shadowy halls, echoing galleries and fragrant chambers and the value of the bath. His genius seems to have indicated most of the things in architecture and its accessories which are acceptable to those who find their joy in this great art. Any discussion on Homer and architecture really embraces all that is best in Greek art, so that the subject is a vast one. It is like accepting a brief for the scheduling of all that adds to the beauty and refinement of life in architecture. Of course, I mean one phase of architecture only, and my reverence is equally great for many others of widely distinct periods of expression in form and treatment, but here we have infinitely more than will suffice for this evening. The architecture that Homer gives largely appertains to stately dwellings; it is the hope of all students that commissions for such will reach them sooner or later. Recently architecture has suffered somewhat from persistent efforts to graft on to that architecture, which should be spacious, large and dignified, such forms, shapes and dimensions as appertain to the cottage or kitchen furniture.

Homer's appreciation for the decorative details of marble, colour, metals, &c., associated with architecture, seems to run on true schemes of harmony. Their gamut is not large (probably the better for that), and consists of gold, silver, ivory and bronze, so that you feel he was familiar with the refinements of life and free from the tyranny of the commonplace. His heroes, during the delight of battle, were decked with magnificent beaten armour, ornamented in repoussé of gold and silver. Some descriptions of such are quoted later, and we only need to refer to vase paintings, &c., to see how good was the general scheme of the armour of the best Greek period. In the "Iliad" we find the first reference to architecture in a suggestive passage on Priam's palace, "adorned with polished colonnades—and in it were fifty chambers of polished stone, builded hard by one another, wherein Priam's sons slept . . . and for his daughters over against them, on the other side within the courtyard, were twelve roofed chambers of polished stone, builded hard by one another."

Hephaistos plays a great part in the arts, he being a great craftsman in metal in the house of the gods. His own dwelling is described as being imperishable, star-like, a house of bronze worked by the crooked god himself, where he forged "tripods, twenty in all, to stand round his hall, and beneath the base of each he had set golden wheels, that of their own

motion they might enter the assembly of the gods and again return unto his house, a marvel to look upon; this much were they finished that not yet were the ears of cunning work set thereon—these he was making ready and welding chains," &c.

Here follows the description of the shield of Achilles. It is carefully detailed at some length, but quite worthy of your attention, and gives with a keen insight all that goes to make magnificent subjects illustrating such incidents as embrace all those elements which are decorative. Here there is no lack of matter to fill with interest and beauty many friezes, and we know how difficult it is to find a *motif* or a subject that is really decorative in itself. "He threw bronze that weareth not in the fire and tin and precious gold and silver, and next he set on an anvil stand a great anvil and took in his hand a sturdy hammer. First fashioned he a shield great and strong, adorning it all over, and set thereon a shining rim triple, bright glancing. Five were the folds of the shield itself, and thereon he fashioned much cunning work from his wise heart. There wrought he the earth and the heavens and the sea, and the unwearied sun and the moon waxing to the full, and the signs every one wherewith the heavens are crowned: Pleiads and Hyads and Orion's might, and the Bear that men call also the Wain—her that turneth in her place and watcheth Orion, and alone hath no part in the baths of Ocean.

"Also he fashioned therein two fair cities of mortal men. In the one were espousals and marriage feasts, and beneath the blaze of torches they were leading the brides from their chambers through the city, and loud arose the bridal song. And young men were whirling in the dance, and among them flutes and viols sounded high; and the women, standing each at her door, were marvelling. But the folk were gathered in the assembly palace, for there a strife was arisen, two men striving about the blood price of a man slain, and both were fain to receive arbitrament; and the folk were cheering both as they took part on either side. And heralds kept order among the folk, while the elders on polished stones were sitting in the sacred circle, and holding in their hands staves from the loud-voiced heralds. Then before the people they rose up and gave judgment each in turn. And in the midst lay two talents of gold, to be given unto him who should plead among them most righteously.

"But around the other city were two armies in siege with glittering arms. And two counsels found favour among them, either to sack the town or to share all with the townsfolk even whatsoever substance the fair city held within. On the wall there stood to guard it their dear wives and infant children, and with these the old men; but the rest went forth, and their leaders were Ares and Pallas Athene, both wrought in gold, and golden was the vesture they had on. Goodly and great were they in their armour, even as gods, far seen around, and the folk at their feet were smaller. And when they came where it seemed good to them to lay ambush, in a river bed where there was a common watering-place of herds, there they set them, clad in glittering bronze. And two scouts were posted by them afar off to spy the coming of flocks and of oxen with crooked horns. And presently came the cattle, and with them two herdsmen, playing on pipes; they took no thought of the guile. Then the others, when they beheld these, ran upon them and quickly cut off the herds of oxen and fair flocks of white sheep, and slew the shepherds withal. But the besiegers, as they sat before the speech-places and heard much din among the oxen, mounted forthwith behind their high-stepping horses, and came up with speed. Then they arrayed their battle, and fought beside the river banks, and smote one another with bronze-shod spears, and among them mingled Strife and Tumult, and fell Death, grasping one man alive fresh wounded, another without wound, and dragging another dead through the mêlée by the feet. Like living mortals, they held together and fought, and hurled the corpses each of the other's slain.

"Furthermore, he set in the shield a soft, fresh-ploughed field, rich tilth and wide, the third time ploughed, and many ploughers therein drave their yokes to and fro as they wheeled about. Whosoever they came to the boundary of the field and turned, then would a man come to each and give into his hands a goblet of sweet wine, while others would be turning back along the furrows fain to reach the boundary of the deep tilth. And the field grew black behind and seemed as it were a-ploughing, albeit of gold, for this was the great marvel of the work.

"Furthermore, he set therein the demesne-land of a king, where hinds were reaping with sharp sickles in their hands some armfuls along the swathe were falling in rows to the earth, whilst others, the sheaf-binders, were binding in twisted bands of straw. Three sheaf-binders stood over them, while behind, boys gathering corn and bearing it in their arms gave it constantly to the binders; and among them the king in silence was standing at the swathe with his staff, rejoicing in his heart, and henchmen apart beneath an oak were making ready a feast and preparing a great ox they had sacrificed, while the women were strewing much white barley to be a supper for the hinds.



"Also he set therein a vineyard teeming plenteously with clusters, wrought fair in gold; black were the grapes, but the vines hung throughout on silver poles; and around it he ran a ditch of cyanus, and round that a fence of tin; and one single pathway led to it, whereby the vintagers might go when they should gather the vintage. And maidens and striplings in childish glee bare the sweet fruit in plaited baskets. And in the midst of them a boy made pleasant music on a clear-toned viol, and sang thereto a sweet Linos-song with delicate voice; while the rest, with feet falling together, kept time with the music and song.

"Also he wrought therein a herd of kine with upright horns, and the kine were fashioned of gold and tin, and with lowing they hurried from the byre to pasture beside a murmuring river, beside the waving reed. And herdsmen of gold were following with the kine, four of them, and nine dogs, fleet of foot, came after them. But two terrible lions among the foremost kine had seized a loud-roaring bull that bellowed mightily as they haled him, and the dogs and the young men sped after him. The lions rending the great bull's side were devouring his vitals and his black blood, while the herdsmen in vain tarred on their fleet dogs to set on, for they shrank from biting the lions, but stood hard by and barked and swerved away.

"Also the glorious lame god wrought therein a pasture in a fair glen, a great pasture of white sheep, and a steading and roofed huts and folds.

"Also did the glorious lame god devise a dancing place like unto that which Daidolos wrought for Ariadne of the lovely tresses. There were youths dancing and maidens of costly wooing, their hands upon one another's wrists. Fine linen the maidens had on, and the youths well-woven doublets faintly glistening with oil. Fair wreaths had the maidens, and the youths daggers of gold hanging from silver baldrics. And now would they run round with deft feet exceeding lightly, as when a potter sitting by his wheel that fitteth between his hands maketh trial of it whether it run; and now anon they would run in lines to meet each other. And a great company stood round the lovely dance in joy (and among them a divine minstrel was making music on his lyre).

"Also he set therein the great might of the River of Ocean around the uttermost rim of the cunningly fashioned shield.

"Now, when he had wrought the shield great and strong, then wrought he him a corslet brighter than a flame of fire, and he wrought him a massive helmet to fit his brows, goodly and graven, and set thereon a crest of gold, and he wrought him greaves of pliant tin."

In the *Odyssey* we learn more of the arts that appertain to home life and its hospitality; the provision for these things is mainly the architect's function, so that we may not pass them over. Bathing and anointing with olive-oil and sweet herbs to end all fatiguing journeys and to precede all feasts. Much was made of guests arriving from either peaceful or warlike expeditions. They were led into the hall.

"They sat down orderly on seats and high chairs, and when they were come the old man mixed well for them a bowl of sweet wine, which now in the eleventh year from the vintage the housewife opened."

When Telemachus was welcomed at the house of Menelaus by his wife we find the following:—"Helen bade her handmaids set out bedsteads beneath the gallery and fling on them fair purple blankets and spread coverlets, and thereon lay thick mantles to be a clothing over all. So they went from the hall with torch and spread the beds, and the henchmen led forth the guests. Thus they slept there on the outer gallery of the house—the hero, Telemachus, and the splendid son of Nestor."

Again, when Telemachus and his men had "tilted his chariot against the shining faces of the gateway, and led them into the hall divine, and they beheld and marvelled as they gazed through the palace, for there was a gleam, as it were, of sun or moon through the lofty palace of renowned Menelaus. But after they had gazed their fill they went to the polished baths and bathed them. Now when they had bathed and anointed them with olive oil, and cast about thick cloaks, they sat on chairs by Menelaus, and a handmaid bore water for the hands in a goodly golden ewer and poured it forth over a silver basin to wash withal, and to their side she drew a polished table and laid upon the board many dainties." When they had put from them "the desire of meat and drink," there comes a finely-expressed speech of thanks from Telemachus. To quote:—"Son of Nestor, delight of my heart, mark the flashing of bronze through the echoing halls, and the flashing of gold and of amber, and of silver and of ivory. Such like, methinks, is the court of the Olympian Zeus within, for the world of things that are here; wonder comes over me as I look thereon." A portion of the reply of Menelaus should be quoted:—"Yea, for after many a woe and wanderings manifold I brought my wealth in ships. I roamed over Cyprus and Phœnicia and Egypt, and reached the Ethiopians and Sidonians and Erebi and Libya."

Here is another passage bearing on the domestic life:—"Helen came forth from her fragrant vaulted chamber, like Artemis of the golden arrows; and with her came Adrastê and set for her the well-wrought chair, and Aleippê bare a rug of soft wool, and Phylô bare a silver basket which Alcandrê gave her, the wife of Polybus, who dwelt in Thebes of Egypt, where is the chiefest store of wealth in the houses. He gave two silver baths to Menelaus and tripods twain and ten talents of gold, and besides all his wife bestowed on Helen lovely gifts; a golden distaff did she give, and a silver basket with wheel beneath, the rims thereof were finished with gold," &c.

Other quotations follow bearing on the matter:—"Helen stood by the coffers wherein were her robes of curious needlework which she herself had wrought." Menelaus to Telemachus:—"And of the gifts such as are treasures stored in my house I will give thee goodliest and greatest of price. I will give thee a mixing-bowl beautifully wrought; it is all of silver, and the lips thereof are finished with gold—the work of Hephaestus."

Throughout the whole of Homer's writing there is evidence of a close acquaintance with the treasures of art of many races, and the examples of these may have fired his imagination; but it is not my function to enter into this wide field of archaeology and conjecture. In the descriptions handed down by ancient writers of the work of Phidias and his pupils, there is the great statue of Zeus, with which no other artist can compete, a statue of large proportions carved in gold and ivory, seated on a throne holding in his right hand a figure of victory and a sceptre, capped with an eagle in his flight. His garment was covered with low-relief sculpture of figures and lilies. On the throne and footstool were mythological conceptions worked in relief and colour. The rests for the footstool were lions in gold. The head of the god was not passionate or distorted in expression, but calm, majestic and godlike; and through the whole work of figure, throne and canopy was that rare sense of refinement and impressive distinction in design which should stamp a supreme piece of art. Then there was the great statue of Athene on the Acropolis, and the incomparable frieze; but his supreme position and works in the world are too well known for me to take up your time in enumeration, uniting, as it does, all that is perfect in craftsmanship and dignity of design. Many quotations might be given from the *Odyssey*, but probably the following will suffice as bearing on architecture:—

"Meanwhile, Odysseus went to the famous palace of Alcinoüs, and his heart was full of many thoughts as he stood there, or ever he had reached the threshold of bronze, for there was a gleam, as it were, of sun or moon through the high-roofed hall of great-hearted Alcinoüs. Brazen were the walls which ran this way and that from the threshold to the inmost chamber, and round them was a frieze of blue, and golden were the doors that closed in the good house. Silver were the door-posts that were set on the brazen threshold, and silver the lintel thereupon, and the hook of the door was gold. And on either side stood golden hounds and silver . . . and within were seats arrayed against the wall this way and that from the threshold even to the inmost chamber, and thereon were spread light coverings thinly woven, the handiwork of women. . . . Yea, and there were youths fashioned in gold, standing on firm-set bases, with flaming torches in their hands, giving light through the night to the feasters in the palace. And he had fifty handmaids in the house, and some grind the yellow corn on the millstone and others weave webs and turn the yarn as they sit restless as the leaves of the tall poplar trees, and the soft oil drops off that linen, so closely is it woven. . . . And without the court hard by the door is a great garden of four plough gates, and a hedge runs round on either side, and here grow tall trees blossoming, pear trees and pomegranates and apple trees with bright fruit and sweet figs and olives in their bloom. The fruit of these trees never perisheth or faileth, winter nor summer, enduring all through the year evermore; the west wind blowing brings some fruits to birth and ripens others. Pear upon pear waxes old, and apple on apple, yea, and cluster ripens on cluster of the grape, and fig upon fig. There, too, hath he a fruitful vineyard planted, whereof the one part is being dried by the heat, a sunny plot on level ground, while other grapes are gathering, and yet others they are treading in the winepress. In the foremost row are unripe grapes that cast the blossom, and others there be that grow black to vintaging. There, too, skirting the furthest line, are all manner of garden-beds planted trimly, that are perpetually fresh, and therein are two fountains of water, whereof one scatters his streams all about the garden and the other runs over against it beneath the threshold of the courtyard and issues by the lofty house, and thence did the townsfolk draw water."

The greater part of this applies to the garden, but as many architects now include schemes for laying out gardens in their plans it should be of interest.

The following quotation may be added which bears on the reception and treatment of a guest, necessarily associated with



Domestic architecture:—"Pontonous, the henchman, set for him a high chair inlaid with silver, in the midst of the guests, leaning it against the tall pillar, and he hung the loud lyre on a pin, close above his head, and showed him how to lay his hands upon it, and close beside him he placed a basket and a fair table, and a goblet of wine by his side . . . after they had put from them the desire of meat and drink, the Muse stirred the minstrel to sing the songs of famous men."

It seems to me that the architect Ictinus and Phidias have petrified the dreams or prophecies of Homer, so that we can in a measure believe they were one in architectural design, the one finding his expression in words and the other in such material elements which embody architecture and give it a local habitation and a name.

It should be our function to gather the threads together of what makes Greek art so great, and I can only indicate some things which occur to me as evidence. These I submit with some diffidence, not being an expert or having my mind charged with a great store of knowledge of the vast field of Greek architecture.

From what I have seen in Greece, the perfection of the workmanship of every detail in the architectural remains is very patent—from the perfect arrises of fillets and flutes of the immense Doric columns, the soft and accurate curves of the volutes in the Ionic caps, the daintiness, finish and shape of the egg and tongue and other details of acanthus leafage on horizontal mouldings; the fine, sinuous uniting curves and relief of the acanthus when used in larger and detached forms; the true and delicate contours of their mouldings and the juxtaposition of larger flat curves with smaller incised and sharply-cut members; the sense of decoration they get in soft horizontal lines of shadow being picked up and accentuated by the sharp incisive darks below.

The evidence of reserve in the disposition of ornament—if their ornament was full of nice detail so was it laid on a quiet field, and thus lost none of its value. This vignetting of the sculptor's jewels is a most commendable feature in architecture.

The satisfactory way in which their bas-relief panels filled up the space they were to adorn—the subject filled the space fully and with dignity, the heads not slipping far below the top moulding. What could be better in this respect than the frieze of the Parthenon?

In their groups of ornament note, notwithstanding much small work in parts, running through are always larger curving, uniting forms so that the general effect is in no way belittled, but delicacy and breadth of expression is maintained.

Note the coins of the best period, how "largely" the heads fill the circle. How fine and dignified is the convention or design of the hair and other accessories. How the lions, the goats, the bulls have those parts accentuated which express their attributes, forerunner of the same sense as is seen in animal forms in the early heraldry of the Middle Ages. It may appear curious to cite coins in speaking of architecture, but their sense of largeness and true invention contains that which makes fine architectural ornament. Whatever may be the period or style of architecture in which it is your destiny to work, the storing of these details just mentioned in the cells of the mind should create such an innate sensitiveness to bad proportion, clumsy forms and imperfect workmanship as would form a large proportion of an architect's education.

Their candelabra are fine in contour and ornamentation of curved forms and the right distribution of mouldings, with long spaces between on the shafts.

The real Greek lyre is a fine example of design as seen on the coin. In modern times there is no poor instrument that has been so tortured away from its great prototype. The stage property-man has much to answer for in this respect.

Our incomparable British Museum is a treasure house of Greek art, and there you may note how satisfactorily many things relating to architecture are accomplished. See how the groups of sculpture in the Parthenon pediment fill the triangular space and, as you may know, this has not always been done in modern buildings with success. The high reliefs of the figures in the metopes show a fine expressive crispness suitable to their position. The frieze, which, of course, comes within the shadow, has a treatment of another kind, comparatively low in relief, yet giving a fine sense of breadth and refinement. At the first glance you think that the great purple shadows on Greek architecture are lightless, but on examination such is the quality of the iridescent light, innumerable soft reflections play on these reliefs and give them more definition and harmony. Well, in such juxtapositions where two ways of treatment are involved, the result is an added value to each form of detail. This also applies to mouldings and other forms of decoration. The architects of the Italian Renaissance have treated the ornamentation and profiles of mouldings with a charming variety and liberty. Mina da Fiesole is about the best in this way. Yet do not start from Mina da Fiesole in your efforts to add further interest to such detail; rather add your invention to the purer Greek forms.

The museum contains in the archaic-room an Ionic capital from the Temple of Ephesus, which seems to me the perfection of treatment in the volutes—so soft, yet large and truly architectural. It seems to me to be finer than those of the Erechtheum.

Note in some of the statues how broad and searchingly expressive of the contours of the figures are the draperies, yet when leading away from the figure how they are licked up into crisp and expressive lines which would show against the sky or other background (especially in those statues that are to express movement).

In the museum you will notice how architecturally that noblest of decorative animals, the horse, is treated.

It may be contended that there is not much to be learned of architecture proper from Homer, yet I venture to think that what he says of it is of significance and interest to those practising this art, for by that means they will be led to take a deep interest in the efforts of later Greek architects and artists to illustrate or build up into permanent form his imagery. The examination of their achievements will result in an education. Really, beauty is required of you on special occasions, apart from that which is scientific or constructive. You cannot give beauty to your work by a paragraph in the specification. Now the world expects of you, over and above perfect planning, construction and sanitary excellence, that crown which we name beauty and which Jules Breton has defined as "the splendour of the true."

Please do not think that your task is to reproduce only from the cells of memory the best details of the Greek or any other period; but think how much can be gathered from their sense of proportion, the value of plain spaces and the vignetting and placing of such adornments as their sculptors, painters and metal craftsmen could supply.

To me the clothing of the Greeks ranks, as costume, very high, if not the highest, as a motif for the architectural sculptor. It does not seem an invention of pushing tailors. It is of the simplest construction, and follows and accentuates all the sinuous motions of the figure. Its lines are endless in variety, and can be governed by, and made subservient to, the sculptor's aims. What perfect gems in design, craft and line are the best Tanagra figures, as you may observe in the British Museum, mostly illustrating quiet domestic incidents; but there are in the museum in Athens several examples showing remarkable and vigorous technique in the expression of the swirl of the dance.

The best Mediæval costumes bear a close relationship to those of the Greek. Then, again, the symbols of their religion, as seen in the Parthenon frieze, are of refined and decorative forms. The late Lord Leighton uses them with great effect in his picture *The Daphnephoria*, I venture to say, one of the finest decorative pictures ever painted. Although it represents another form of festival than that on the Parthenon, it always leads me to realise how great as a decoration in form and colour must have been the actual procession which Phidias illustrates. We can imagine it on its progress along the Sacred Way, winding through the shallow valleys, and anon outlined against the blue and sapphire of the Saronic Gulf and the Peloponnesian mountains.

We gather from Homer a fine sense of site for his architecture, as he mentions in his descriptions the House of Alcinous as having a fair prospect. Then, again, a later writer speaks of Athens as the "city of the violet crown," the crown being the Parthenon.

I can speak from experience of the site of the House of Agamemnon on the lower spurs of the mountains of Argos. Behind are the higher peaks and far away below stretch the plains of Argolis. As Homer phrases it, the pasture-land of horses, and beyond the boundaries of this plain lies the blue shimmering bay of Nauplia. On speaking of Greek landscape with its long, horizontal lines of blue seas and grey-green plains, from the boundaries of which rise the broad and dignified mountain forms, all bathed and united in the iridescent air of that divine land, makes it an unequalled source for instilling into an architect such a sense of colour for decorative purposes as cannot be obtained from text-books of coloured ornament.

This reference to landscape may seem a wandering away from architecture, but no source of inspiration is unworthy. Most architects have a deep interest in interior colour, but many cherish as their only idols schemes of grey-greens and reds, avoiding that which is sumptuous in colour. When you get over the wall of the Swiss Alps revelations come upon you that the diffused purple has harmonies equally beautiful. In Greece all the greens, blues and greys, &c., seem to be steeped in a bath of purple. This veil of purple iridescent atmosphere is the magic which assimilates and brings all local colour into decorative completeness. Unfortunately, we cannot bring the quality of the sunlight here, but still remembrance of these things has an educational value.

An architect's life and practice is, we know, inextricably mixed up with specifications, quantities, dilapidations, sanitary and other engineering, *et cetera*. There is no escaping the well-



known ending to specification paragraphs—the very convenient *et cetera*. Yet sometimes the opportunity comes when a fine creation is demanded of him in which all these things for the moment are of secondary importance—when, like Homer or Shakespeare, he must give to airy nothingness a local habitation. Even as seeds in the idle fallows long for the gentle rains, so will he sigh for that enthusiastic and supersensitive state of mind from which creation is won. My remarks may have been of a wandering nature, but apart from the science and ever-changing needs of architecture, it is a great and beautiful art, and to give it that crown of art or beauty, air of distinction or style—call it what you will—that subtle seal which Phidias, Bramante, Wren, the great Goths and many others have set upon their work, some little deviation in the side paths of the softer emotions cannot be a fruitless journey. Whatever may be the perfection of the anatomy of the parts of your architectural work, it can never suffer from wise and restraining disposition of its bejewelling.

Frankly a great architect must possess many gifts. He must have that which is generally known by the words common sense; it is rather a clumsy phrase which means so much, for it really embraces a subtle practical wisdom, a sense of winnowing the wheat from the chaff, and as far as architecture is concerned a thinker in building material rather than in pencil. I venture to say he must have added to these qualities the instincts of a poet to finally set that seal of completeness on his conception which makes a work of art.

Mr. JOHN SLATER, who proposed a vote of thanks to the author of the paper, said Mr. Spence had taken a line in the subject which he had not expected, and one which could draw little discussion from the architectural point of view. They must not take the descriptions of the palaces in Greek poems too literally. The bards committed the poems to memory, and then made up and inserted passages. In the descriptions of imaginary grand buildings the writers enlarged on the grandeur; they knew barbaric splendour and they also knew the more splendour they crammed into their descriptions the greater interest was taken in their narratives. The general drift of the paper had been to impress upon the minds of students the value of steeping themselves in a knowledge of Greek work. Such advice could not be laid too much to heart by lovers of architecture.

Mr. R. PHENÉ SPIERS, who seconded the motion, said the paper had suggested that it was not simply building construction that should take up the student's thoughts; there was a higher sphere, that of the poetical, which should influence his design.

Mr. J. D. CRACE supported the motion.

The CHAIRMAN, in putting the vote to the meeting, said the study of Greek architecture in England laboured under some disadvantages. It seemed necessary that in order to appreciate fully the beauty of Greek art, one must see it under its own climate.

### METROPOLITAN THEATRES.

THE theatres and music-halls committee of the London County Council have just issued a report, signed by Sir Algernon West, the chairman, on the subject of the Council's treatment of theatres under the license of the Lord Chamberlain in respect to the public safety. It appears that the Lord Chamberlain in July last stated that he understood there were certain theatres that had not yet complied fully with the requisitions made by the Council at its general inspection of the previous year, and that in the circumstances he would be glad if the Council would give instructions to have such theatres inspected, and he asked that he might be favoured with a report upon their condition. Later on his lordship forwarded to the Council a copy of a circular which he had sent to the managers of the theatres licensed by him, to the effect that he would not grant any licenses for the performance of plays in theatres until the several managers were provided with a representation in writing from the London County Council that such theatre was properly safe from the danger of fire. The Lord Chamberlain was next informed that it was impossible for the Council definitely to state that a theatre was "properly safe from the danger of fire," as a certain amount of risk in every place of amusement was bound to be incurred, however well the house be constructed. It was arranged, therefore, that the theatres should be bound to come up to the Council's standard of safety. Upon hearing from the Lord Chamberlain in August that he would require such a certificate for the coming licensing day on September 29, the officers were instructed to survey the theatres. In the short time at their disposal, however, it was impossible to complete so heavy a piece of work, and accordingly it was agreed to grant full licenses to all theatres which had been surveyed and had complied with all the requisitions, and to grant provisional licenses of three months to the remaining theatres which had either not completed the necessary works or had not yet been surveyed

by the Council's officials. In matters of this kind misapprehension might arise owing to a want of appreciation of the facts of the case, and it was with the object of informing the public that this report had been issued.

### WEATHERING OF MAGNESIAN LIMESTONE.

DURING the summer of 1899, whilst the Jermyn Street front of the Geological Museum was being renovated, the opportunity was taken of collecting several specimens of the stone to see how it had been affected by half a century of London atmosphere. The museum was erected during 1848 to 1851 from designs by Sir James Pennethorne, architect. Owing, however, to more important work having to be attended to it was not possible for the chemists of the Geological Survey to complete the examination till recently. An interesting paper has appeared recently by Mr. E. G. Clayton, F.I.C., "On an Incrustation from the Stone Gallery of St. Paul's Cathedral." This paper is of great interest in connection with Portland stone in London atmosphere. The report on the selection of stone for the Houses of Parliament by Charles Barry, H. T. de la Beche, William Smith and Charles H. Smith, London, 1839, should be referred to, as it was a similar stone to the one recommended that was used in this museum. The stone used here was from North Anston, Yorks, and its composition is given as:—

	Upper bed.	Fourth bed.	Lower or eighth bed.
1. Calcium carbonate . . . . .	52.0	52.5	52.8
Magnesium carbonate . . . . .	45.2	44.7	44.4
Oxide of iron and earthy matter . . . . .	2.0	2.1	2.1
Moisture . . . . .	.8	.7	.7
	100.0	100.0	100.0
2. Calcium carbonate . . . . .		54.89	55.37
Magnesium carbonate . . . . .		42.07	41.71
Protoxide of iron . . . . .		.49	.73
Peroxide of iron . . . . .		.24	—
Protoxide of manganese . . . . .		Trace	1.68
Silica . . . . .		.56	.92
Water . . . . .		.51	.45
		98.76	100.86

From these analyses it will be seen that the stone is as near a true dolomite as possible, the ratio of lime to magnesia (mean of these five analyses) being 1:97.

The following are the main points observed in this examination. The stone facing south-west was more weathered than that facing south-east, doubtless due to the south-west winds being mostly wet, and to its being the prevailing wind (cf. Report, p. 4). It is impossible to give any exact figures as to the amount of stone which has been weathered or has flaked off, but probably it is something between 1 and 3 mm. This rough estimate was made possible by the fact that the stone contains occasional segregations of calcite crystals. These have stood the weather much better than the stone itself, and stood out wart fashion on the surface. Where the rain had fallen directly the stone was rather less black than where it was sheltered. Only a trace of magnesium sulphate could be found on the exposed surfaces, whilst an appreciable amount was found where the stone was sheltered.

A microscopic section of a specimen that had been sheltered from the direct action of the rain was prepared showing the surface in section, which Dr. Flett has described as follows:—

The following notes on the microscopic characters of specimens of the stone of which the Museum of Practical Geology is built, and of their weathered surfaces, are by Dr. J. S. Flett:—

The stone is a granular yellow dolomite consisting mostly of small rhombohedra, often rounded and slightly irregular in outline, but showing perfect crystalline form when occurring in cavities and veins. It contains many irregular-shaped pores, which are sometimes filled up with recrystallised dolomite, and through the rock are scattered rounded patches, apparently concretionary. The blackened surface of the under part of the moulding from which the fragment was taken has been preserved, and is well seen in the section. It is covered with small crystals of gypsum, mostly in the form of monoclinic prisms and swallow-tailed twins. These form a layer mixed with black particles, probably sooty matter, and resting on a thin black film, beneath which the rock is unattacked. The average length of these crystals is about 1-100th inch, and the thickness of the deposit, as preserved in the section, a little greater than this. Outside of the thin basal carbonaceous layer there is no dolomite, but only gypsum, which has apparently been formed by the evaporation of aqueous solutions of sulphate of lime, which have leached out of the stone. The black film upon the surface of the dolomite can be seen, where it is less opaque than usual, to consist of fibres of



gypsum crossing irregularly and mixed with black particles, apparently carbonaceous.

This formation of calcium sulphate, or gypsum, on the surface of marbles and limestones in town is well known.

Sir A. Geikie has gone very thoroughly into this in connection with "Rock Weathering, Measured by the Decay of Tombstones" ("Geological Sketches at Home and Abroad," 1882).

In "Geological Sketches" a figure of the altered surface of a marble will be found, which had stood for eighty-seven years in Edinburgh.

The black edge of gypsum and soot similar to that described by Dr. Flett in his account of the microscopic characters above, is very clearly shown.

In addition to this gypsum deposit on the stone of this museum, in one or two places sheltered from rain small crystals, some as long as 3 mm., were found. These occurred presumably where condensed moisture had evaporated. They were found to be magnesium sulphate.

What has occurred is that the sulphurous and sulphuric acids in the air have attacked the dolomite-forming calcium and magnesium sulphates, and the latter being more soluble has to a great extent been leached out. This is entirely borne out by the following analysis. The sample was collected from the surface of the stone as scraped off by the masons in cleaning it. Hence a certain amount of unaltered stone is also in the sample.

The composition was found to be—

Ignited insoluble residue . . . . .	5.2
Oxides of iron and alumina . . . . .	1.4
Lime . . . . .	26.9
Magnesia . . . . .	9.5
Sulphur trioxide . . . . .	20.7
Carbon dioxide . . . . .	19.4
Water lost at 105° . . . . .	1.8
" " between 105° and 150° . . . . .	9.1
Water above 150° + organic matter . . . . .	6.5
	100.5

If we assume the following molecules to be present (the magnesium sulphate was calculated from the amount of magnesia determined in a solution obtained by extracting with cold water) we get :—

CaSO <sub>4</sub> ·2H <sub>2</sub> O . . . . .	41.7
MgSO <sub>4</sub> ·7H <sub>2</sub> O . . . . .	4.0
CaCO <sub>3</sub> . . . . .	22.2
MgCO <sub>3</sub> . . . . .	18.5
*CaO . . . . .	.9
*(FeAl) <sub>2</sub> O <sub>3</sub> . . . . .	1.4
Residue . . . . .	5.2
Moisture and organic matter . . . . .	6.6
	100.5

Comparing this with the five analyses quoted above, it will be seen that the iron oxide and earthy matter has greatly increased, owing to the leaching out of lime and magnesium sulphates by the action of rain and fog.

In conclusion it must be stated that the alteration of the one surface is to a great extent due to chemical causes, owing to the presence of sulphurous and sulphuric acids in the London atmosphere. These decompose the dolomite-giving sulphates of lime and magnesia. The sulphate of magnesia, being a soluble compound, is to a great extent leached out and washed away by rain. The sulphate of lime, being a sparingly soluble compound, is leached out to a far smaller extent and tends to form a coating (with the soot, &c) which helps to protect the stone. No doubt flaking or scaling play an important part in the weathering as well, but it is not possible here to calculate to what extent.

Suffice it to say that with the exception of a few blocks which were of inferior quality and hence had decomposed to a greater extent considering the time and conditions to which the stone had been exposed, the state was by no means satisfactory.

## GLASGOW ARCHITECTURAL ASSOCIATION.

At a meeting of this Association, held in their own rooms, 11 Pitt Street, Glasgow, on the 15th inst., the President intimated that this autumn the Association celebrates the twenty-fifth anniversary of its foundation. He proceeded to describe how it came into existence through the initiative of Mr. James Lindsay and Mr. William Dunn. These gentlemen early in the year 1878 called together a few kindred spirits to discuss the possibilities of an Association, and set the ball

rolling by a notice in the *Glasgow Herald* calling a meeting of those interested. At this meeting it was resolved to form an Association, rules were submitted and passed, and office-bearers elected. A room for meetings was shortly afterwards secured in the Belgravia College, Newton Terrace. This remained the headquarters for two or three years, when a move was made to more central premises at 101 St. Vincent Street. The stay there was also of short duration, being brought to a sudden and tragic end by a fire. Thereafter a suite of rooms was secured at 114 West Campbell Street, where a successful and progressive existence of about eleven years ensued, till in 1895 the Association joined with the Institute of Architects in securing joint chambers at 187 Pitt Street. The President then reviewed the progress of architecture during the lifetime of the Association, and remarked on the great advances that had been made from a practical and artistic standpoint, and referred to the advantages the younger generation of architects had over those of even thirty years ago, in the latest illustrated works, process prints and the greatly increased facilities for foreign travel. Looking to the present conditions of the art world, he further remarked how the present state of economics had affected it. The competition for trade and the consequent rivalry between nations had raised their patriotic spirit, and had led to a general revival in national literature and art. This was manifested in Scotland by the number of books on Scottish history, &c., being published, the great run on examples of Scottish art, and the restoration during the last few years of quite a number of national monuments. Another pleasing result of this movement was the revived interest being taken by architects in the national phases of architecture in Scotland, especially those delightfully picturesque conceptions of the seventeenth and early eighteenth centuries. The President remarked on the fitness of the style for modern treatment, and diverged into a sketch of the domestic life of that period. He drew attention to the fact that the combined evidence of that domestic life and the buildings themselves clearly showed that Scotland was behind her great neighbours in her handling of the Renaissance, not through lack of originality or taste in her architects, but through lack of means in the country to indulge them. At the close of his address, Mr. Whitelaw remarked on the great benefit it was to the individual as well as to the profession that all architects should be members of their professional societies, and expressed a hope that all those who were not already members of the Institute would hasten to join.

## COMPETITION FOR A GREEK CHURCH.

A REPORT by Mr. Frank W. Jackson, United States Consul at Patras, Greece, gives the following information about the international competition for a church :—

The city of Patras has decided upon the erection of a church to cost 250,000 dols., which will take the place of the present edifice dedicated to St. Andrew, erected early in the second quarter of the last century. With a view to securing something especially apt in design, the committee having the matter in charge (composed of the Metropolitan bishop, the Governor of Achaia, mayor of Patras and other prominent officials) has decided to secure plans through an architectural contest, and I have been assured that contributions from American architects will be welcomed. The general order of architecture will be Byzantine, after the spirit of the East, and the following general conditions should be observed :—

1. The dimensions are left to the discretion of the architect, but must come within a ground space of 25,834 square feet.

2. In planning the structure consideration must be given to possible effects of earthquakes, to which this region is subject.

3. The edifice must accommodate at least 5,000 worshippers, not including standing room in the women's apartments or other annexes.

Possible models of architecture might be found in the Russian church of St. Nicodemus, in Athens, or in the church of Sta Sophia, in Constantinople.

The contest will be divided into two parts. All who pass the first degree will be entitled to enter the second degree, and no others. The general requirements of the first degree are as follows :—

1. To submit a general view of the temple and courts on a scale of 1 to 500.

2. View of front of temple ; scale 1 to 200.

3. Two views, front and lateral ; scale 1 to 200.

4. View cross section, setting forth the general plan according to the judgment of the artist.

5. Estimate of the cost.

6. An abridged technical memorandum.

The plans submitted will be passed upon by the committee, and the successful architects will be required to meet some additional conditions.

\* The CaO and (FeAl)<sub>2</sub>O<sub>3</sub> uncombined here are possibly combined with the silica of the residue and with traces of Cl and P<sub>2</sub>O<sub>5</sub>.



## CONCRETE CONSTRUCTION.

THE cement and concrete exhibits at the Düsseldorf Exhibition furnish examples of the results obtainable with skilled workmanship and good materials properly used. These exhibits are grouped in and about a large terrace on the bank of the Rhine. At the head is a large fountain and basin, adorned with concrete sculptural work, and on each flank is a lofty column. The steps, balustrades and arcades of the terrace are all concrete, and one of the neighbouring buildings is a concrete structure resembling in exterior appearance some of the city halls in small German towns. The columns have a total height of 114½ feet. The foundations extend 18 feet below the surface and are made of 1 part cement to 10 parts gravel, with a grillage of steel beams; the foundations are square and measure 42·7 feet on a side. The rather elaborately ornamented pedestals are 40·3 feet high. The shafts are 52·1 feet high, 7·4 feet in diameter at the base and 6·2 feet at the top. The bottom portion, with ornamental reliefs, is a ring of rammed 1 : 5 concrete, while above the work is a succession of rings of similar concrete with a 1 : 2 plain mortar facing; the rings are about 3½ feet high, and each has six vertical and three horizontal steel rods as reinforcement. The shaft has an ornamental capital with a metal dome surmounted by a large concrete figure. Another special feature of the exhibits is a 1 : 4 : 4 concrete bridge of 98·4 feet span and but 6·56 feet rise. The arch is 2·3 feet thick at the springing and 2·13 feet at the crown, and showed no appreciable deflection under a load of over 90 lbs. per square foot.

## EXPERIMENTS WITH CONCRETE.

IN January 1901 some large blocks of concrete were made under the direction of Mr. W. H. Parkhurst, the American engineer, for the purpose of determining the effect of using different amounts of water in mixing on the character of the resulting material. The concrete was mixed by hand on a plank platform adjacent to the moulds, the ingredients being measured in a box holding 4·42 cubic feet when full, and the quantities checked after measuring by weighing them. The water was also measured and weighed. The details and results of the experiment have been described by Mr. Parkhurst in a paper before the Western Society of Engineers.

The accompanying table gives the general data concerning the three blocks. In the case of the dry block, the endeavour was to employ enough water to make a "mealy" concrete, but not to flush it. No amount of ramming the thin layers would bring water to the surface. With the wet concrete men could not stand on the material to ram it; the mass quaked easily, and the mortar clung to the tamping iron. In the case of the medium block, there was enough water so that the top of each layer was flushed by the tamping, but there was no quaking, and the mass was always hard. The top surface had enough free water on it to spatter when the tamping was finished. The blocks were left exposed to the sun, rain and snow for several months and then drilled and broken by plug and feather. Dragon Portland cement was used. The sand and gravel were obtained by a washing plant from the Fox River, and the crushed stone was of "medium" size.

Data of Concrete Test Blocks.

Block.	Dry.	Medium.	Wet.
Portland cement, cubic foot . . .	4·42	4·42	4·42
Portland cement, lbs. . . . .	392	382	382
Sand, cubic foot . . . . .	8·84	8·84	8·84
Sand, lbs. . . . .	908	895	908
Gravel, cubic foot . . . . .	11·05	11·05	11·05
Gravel, lbs. . . . .	1,104	1,078	1,059
Crushed stone, cubic foot . . .	11·05	11·05	11·05
Crushed stone, lbs. . . . .	939	915	919
Water, cubic foot . . . . .	1·81	2·65	3·35
Water, lbs. . . . .	113	166	209
Vol. concrete, cubic foot . . .	25·31	22·69	22·97
Weight, per cubic foot, lbs. . .	136·2	151·5	151·4
Loss of weight per cubic foot during ten months, lbs. . . . .	1·7	4·5	5·9

In mixing the concrete the sand and cement were made into a mortar on which the crushed stone and gravel were spread. The materials were turned over several times by shovels and then placed in the moulds, where they were tamped in layers 6 inches thick. The dry mixture was placed in its box in twenty-five minutes, the medium in twenty-one minutes, and the wet in twenty-three minutes. The dry concrete required and received the most tamping; the wet concrete required nearly as much time to be placed in the mould because so little could be handled on the shovel. After the blocks were finished the surplus water on those of medium and wet concrete froze; this freezing was of short duration.

The blocks stood for about four months exposed to the weather before they were weighed again. As there was not enough water used in making the dry blocks to permit a finish

on the sides or top, the surface could be easily abraded. The gravel and stone came away from the mass quite easily, and the block could not be handled to weigh it without crumbling the edges and top surface. At the end of the four months all the blocks were found to have lost in weight, but the loss of the dry block was not due wholly to the same causes as that of the others, owing to this abrasion. The loss at the end of ten months is given in the table. After the blocks were split the texture of those of medium and wet concrete was excellent while that of the dry concrete was poor and not well compacted.

The conclusions drawn by Mr. Parkhurst from his experiments are as follows:—First, a medium concrete, or one that has not enough surplus water to produce quaking, while having enough to permit easy and thorough ramming, is most desirable. The specification that the concrete shall not quake in the barrow nor while handling, but that it may be wet enough to quake when heavily rammed, would seem about right for regulating the amount of water to be used. Second, it is probably safer to have an excess than to permit a deficiency of water. Above all, however, it is of the utmost importance that the concrete shall be consolidated thoroughly by ramming.

In the discussion following the presentation of the paper Mr. Finley called attention to another discussion of concrete before the Society in 1896, when Mr. Alfred Noble summarised his opinion as follows:—"It thus appears that while there is considerable diversity of opinion as to the exact degree of wetness concrete should have, none of the engineers quoted advise such dry mixtures as are commonly required here. The writer believes that a more homogeneous, a denser and stronger material will be obtained if the concrete is made so wet that the mass will quake after ramming, and furthermore, that where concrete is to be placed in contracted spaces, as between timbers, it may be with advantage made still wetter, so that it can be pushed into place with the shovel, and by treading filling all the spaces solidly, with no important diminution of strength at any point, but stronger as a whole." In commenting upon this opinion, Mr. Parkhurst approved Mr. Noble's suggestion of using wet concrete well rammed in contracted spaces. If this plan is followed a very much better material is obtained, in his opinion, than where dry concrete is used, which will contain many voids.

Some other experiences with concrete mentioned by Mr. Parkhurst are also of interest. In one case certain columns resting on pile foundations were constructed under the head-house of a railroad station. To protect them concrete walls were built connecting one column with the adjacent one between tracks, the walls being 4½ to 5 feet above ground and extending 2 to 3 feet below the surface. As they were built simply for protection, little attention was paid to the foundation. The ground had been solid three or four years before, but was all dug up when the building was constructed, and had not been thoroughly compacted afterward. Crushed granite and limestone were used, with no sand at all in some cases, and a layer of mortar was placed over the walls as soon as possible after the moulds were removed and before the concrete had set. The walls developed long, irregular, vertical cracks in many places, which were evidently due to bad foundations and not to internal stresses. They were cut to pieces in places and the interior was in excellent condition; in all such cases where wet concrete was used the material was found to be very well compacted.

In using concrete in walls Mr. Parkhurst suggests placing the expansion joints from 20 to 30 feet apart. In one wall on the Illinois Central road there are three concrete sections, making together a length of 100 feet, with pilasters every 33 feet. An artificial joint was made adjacent to each pilaster by putting a septum in the mould and building up to it, then taking it away and building the next section, and repeating the process again. The wall was built while the temperature was 50 to 60 deg. The temperature sometimes falls to 20 degrees below zero, and in such extreme weather the joints open fully one-sixteenth of an inch. No cracks had been observed elsewhere.

## RUSKIN MEMORIAL.

ON Tuesday the foundation-stone of a building which is to commemorate the work of John Ruskin was laid by Lord Avebury at Bournville, near Birmingham. The scheme originated with the Ruskin Society of Birmingham, but it has the support of a number of societies and men and women throughout the country. The intention is to provide a village library, art gallery and museum for the diffusion of those ideals which Ruskin preached. The establishment of classes tending to promote the study of nature and to encourage the revival of handicrafts is another branch of the scheme. A site two and a half acres in extent has been provided by the trustees of the Bournville Village Trust. It is in an elevated situation commanding a good view of the model village of Bournville,



and will be within easy reach of several populous districts. The building is designed in a simple Victorian style. The bricks and tiles will be hand-made, and the blending of the colours of the exterior has been carefully studied. The cost of the building and equipment will be about 5,000*l.*, of which some 2,000*l.* have been promised.

Lord Avebury said the project was in harmony with what his friend Mr. Ruskin would have wished. Alluding to the future of our manufactures and commerce, he said he had never shared the melancholy apprehension which some entertained with regard thereto. Whilst our manufacturers were content to face foreign competition by their own clear heads and strong arms, foreign manufacturers said it would be impossible for them to carry on their businesses if they were not assisted by protection. We were much indebted to those who were showing how it was possible to combine manufacture with country life. With regard to Ruskin's work, it would be a mistake to assume it was merely the outcome of great natural gifts and fortunate circumstances. The advantages which he possessed were just those which had led many to a life of luxury and uselessness. But Mr. Ruskin made the most of his advantages and fought bravely against his disadvantage of ill-health. What he accomplished he accomplished by means of continual application and hard work. His life was a great lesson, better than his advice, better even than his books.

### TESSERÆ.

#### The Doric Order.

EVERY detail of pure Greek architecture is actively engaged in announcing the facts of the upbearing power and the burden which is upborne, and in expressing a just balance of the two forces. The antithetical comparison which is often made between the "verticality" of the Pointed and the "horizontal" of the Greek style is quite without foundation. If this relationship exists anywhere, it is between the Pointed and the Egyptian architectures. In the Doric, and in a less degree in the Ionic style, the aspiring Gothic and the low and heavy Egyptian expressions are perfectly combined; the first expression breathing from every curve and cut of shaft and capital, the latter showing itself, with surprising variety and power, in all the features of the entablature, in the dead unbroken mass of the architrave, in the frieze with its hanging row of triglyphs and guttæ, in the impending corona of the cornice, and, finally, in the low, pyramidal pediment. Ruskin criticises the details of Greek architecture as if they were not architecture—as if they might be plucked from the building, like flowers from the stalk, without any loss of significance; but the fact is that properly speaking they are not decorations at all. The influence of triglyphs does not depend primarily on their severity and simplicity, but on their power, in juxtaposition with the guttæ beneath them, of greatly strengthening the idea of weight in the entablature, by the addition of their pendent effect to the effect of simple mass in the bare architrave below them, and of impension in the cornice above them. Conceal the lines of triglyphs and guttæ in the print of a Doric temple with your paper-knife and the building will look light-headed at once; that is to say, the actively expressed power of support in the shafts will appear to be in painful disproportion to the burden carried by them. Again, we believe that the bark of a tree, or any other "canaliculated organic structure," is the last thing that anyone with no particular theory at heart would ever think of in looking at a fluted shaft. This symbolism may have given birth to the flutes; but the beauty which continued their use and made it in variable, and which, as Ruskin allows, is instantly felt in it, has many accounts better than this to render of itself. The business of the shaft is to support weight; the aim of the Greek architect was to make it express as well as perform that business. The mind instinctively attributes motive and ascendent energy to a series of vertically convergent lines, which are checked before reaching their focus. This effect is much increased in the Doric shaft by the gentle swell or entasis which accompanies its swift taper; but another and far more subtle, and at the same time powerful, reason for the fluting is in the capacity of the series of concave surfaces to express an active resistance against, or rather a denial of, any tendency to burst and crumble beneath the superimposed burden. This may, perhaps, seem a refinement, but let the reader compare the fluted Greek with the smooth "Roman Doric" shaft, and he will probably acknowledge that a certain unpleasant effect which always accompanies the last, and which caused the Greeks invariably to flute their shafts, is mainly owing to the absence of any such suggestion of resisting power. That which sounds like an over-refinement when explained to the understanding is often simple enough to the eye.

#### Lübeck.

Everywhere in Lübeck it is impossible not to be struck with the extreme boldness with which the Mediæval architects trusted to unbroken, unadorned masses of plain, unsophisticated

brickwork. This very simplicity is the evidence of power and of honesty. When shall we learn that there is a dignity in repose and rest, and that many a wall is in no wise improved by arcading and windows at even intervals over its whole surface, when their only object is to look smart and pretty? The houses in this old city have, unhappily, been everywhere whitewashed. They usually present their gables to the street and are arcaded with three or five arches running up into the gables, and within which the various windows are pierced. The civic buildings are singularly fine. The Rathhaus is mainly remarkable for the enormous screen walls, which are carried up to mask the roofs of some parts of the building. All brick architecture seems to have been more or less productive of shams, and here, just as we see in Italy, the shams are on the most prodigious scale. This work deserves description, however, for its intrinsic merits. The screen, on the side towards the street is divided by octagonal turrets into four bays, each bay is subdivided by two brick arches; these are filled in below with tracery panels of two trefoiled lights, and a large circle filled with reticulated tracery formed by the repetition of a brick moulded in the shape of a portion of a quatrefoil; above these tracery panels are two arched openings and a large circle above them fringed with brick cusping. The whole work is executed in black and red brick, without any stone. The back of the same building towards the market-place is very similarly treated, and a good deal of effect is produced by the introduction of a great many brightly-blazoned coats of arms, set within brick medallions. The arcades on the ground level are of brick on stone columns—a good arrangement—for the innumerable jointings of brickwork always make it a rough and weak-looking material for this purpose. The gateways—the Burg Thor and the Holstein Thor—are the last and crowning points of interest in Lübeck. The former is a square gateway, six stages in height, and covered with traceried arcades throughout. The group of buildings close to its inner face is all of the same character, with picturesque stepped gables and traceried brick parapets at the sides. The other gateway is probably the largest and finest in Europe, and its tall slated roofs harmonise admirably with the deep red brick of its enormous expanse of arcaded wall. The string-courses here were double, with the space between them filled in with inlaid terra-cotta enrichments.

#### The Walls of Babylon.

The concurrent testimony of travellers describes the ruins of Babylon as mere mounds of earth, heaps of soil, the remains of houses fallen in. It is probable that most of the private buildings of antiquity were composed of mud or cob, as Rennell describes the modern houses of Bussorah, and adds that after a heavy rain the falling in of houses in the streets is no uncommon occurrence. The magnificence of royalty and pomp of religion were displayed in expensive monuments of brick or stone. To take such an instance as Pæstum, the temple remains, the basilica exists, the stone foundations of the city walls may be traced, while the dwellings of the inhabitants are gone, crumbled into the earth from whence they were made; the grey monuments of a more durable material stand out like the bleached skeleton of some mighty megalotherion whose flesh has long since mouldered into corruption. The celebrated walls of Babylon were certainly not entirely built of brick; the singular mode of their construction has long been a matter of some difficulty. We do not pretend that the process was exactly that of the cob of Devon, although the remains at present are so precisely the same. The difference seems to be that the cob of Babylon was raised dry, in solid forms of unbaked earth, that is, of cob made in detail, laid at certain elevations on layers of reed, and then cemented together. We learn from Herodotus that they were built of the earth which came from the excavation of the surrounding moat. Diodorus Siculus, who gives the most particular account, mentions an interior wall of unbaked brick, or to adopt the words used by Rennell on another occasion, of "clods of earth." This agrees with their present state as described by Sir R. Ker Porter, "masses composed of mud mixed with chopped straw or broken reeds, and then dried in the sun." According to Eusebius, quoting Abydenus, they were rebuilt by Nebuchadnezzar, or, according to Larcher, by Semiramis his wife—the original walls having perished, melted into air. Berosus, a Chaldean author, describing these rebuilt walls, particularly states that some were of burnt and others of unburnt brick. These renewed walls in their turn have crumbled away. St. Jerome, writing in the fourth century, and on the authority of a travelling monk, an eye-witness, relates that they were just sufficient to form an enclosure for the hunting preserves of the Persian king. No trace whatever of these walls can now be discovered at Babylon, although the most careful researches have been made by many and intelligent travellers. They too have vanished, and, like the baseless fabric of a vision, have left no wreck behind; while the walls of Hilla near the site of Babylon are described by Rich "as of mud and presenting a truly contemptible appearance."





### Consulting Electrical Engineers.

SIR,—I enclose a copy of a letter on the subject of professional etiquette in electrical engineering work, which is being sent to-day, by order of my Council, to the clerks of some of the larger counties and boroughs.—I am, yours very truly,

W. G. McMILLAN, Secretary.  
The Institution of Electrical Engineers,  
28 Victoria Street, London, S.W. :

October 17, 1902.

SIR,—As it has come to the knowledge of the Council of this Institution that in several cases consulting engineers have applied for employment, and in others local authorities have advertised for consulting engineers, I am instructed by the Council to forward a copy of the code of etiquette in such matters that, in their opinion, ought to govern all those belonging to the Institution.

I am also instructed to urge upon you the great importance of having electrical work well done at the most moderate outlay, and would point out that by advertising, or by employing those who solicit employment either directly or by agents, local authorities may deprive themselves of the services of electrical engineers of high standing and great experience.—I have the honour to be, sir, your obedient servant,

W. G. McMILLAN, Secretary.

### *Standard of Professional Etiquette for Consulting Electrical Engineers as approved by the Council of the Institution of Electrical Engineers, July 16, 1902.*

1. No consulting engineer should solicit employment as consulting engineer verbally, by letter, by agent paid by commission or otherwise, or by any other means.
2. No consulting engineer should answer advertisements for consulting engineers.
3. No consulting engineer should advertise for employment.
4. No consulting engineer should pay by commission or otherwise any one who introduces clients.
5. No consulting engineer should receive trade or other discount or surreptitious commissions or allowances in connection with any works which he superintends.
6. A consulting engineer who is also directly or indirectly interested in any contracting or manufacturing business should inform his client in writing what his connection is with such contractor.

### Re Transvaal Association of Architects.

SIR,—Since it was decided to alter the title of the South African Association of Engineers and Architects, founded in 1891, and to eliminate the word "Architects," there has been no association in this country adequately representing the profession. The architects belonging to the South African Association of Engineers, with other qualified members of the profession, practising here before the war, have constituted themselves into a separate association to be known as "The Transvaal Association of Architects."

The objects of the Association are primarily to form an influential representative body on the lines of the Royal Institute of British Architects, to whom the Government, the Town Council and other public institutions may refer matters on which they desire the views of the profession, and to represent the views of the profession generally.

At a meeting held on June 5 it was resolved to form an association.

The following gentlemen form the executive:—Viscount Milner, G.C.B., G.C.M.G., hon. president; Mr. E. B. J. Knox, M.I.C.E., A.R.I.B.A., president; Mr. W. Leck, M.S.A., and Mr. G. A. Hamilton Dickson, A.R.I.B.A., vice-presidents; Mr. P. E. Treeby; Mr. G. S. Burt Andrews, M.S.A.; Mr. W. H. Stucke, A.R.I.B.A.; Mr. J. Waterson; Mr. F. Emley, M.S.A.; Mr. G. A. Hamilton Dickson, A.R.I.B.A., hon. sec. and treasurer.—I have the honour to be, your obedient servant,

H. VICKERS, Secretary.

Johannesburg : September 22, 1902.

### Sussex Manors.

SIR,—Your issue of the 17th inst. gave a detailed account of the manor of Streatham and others in the above county. I should like to state that in Lambeth Palace Library there is a collection of Court rolls, stewards' accounts of several of the Sussex manors, and of the "peculiars" of the Archbishopric. The series was catalogued and arranged some years ago, and is available for use on the open library days, Saturdays excepted. To mention places, as Tangmere, Ringmer, the Pallant (Chichester), Amberley, Slindon and

others is to quote but a few examples; local boundaries, name of landowners and other minute matters appear in all these documents of extreme interest.—I am, Sir, yours, &c.,

S. W. KERSHAW, M.A.

October 22, 1902.

### GENERAL.

**The Adelphi Site** for the proposed buildings of the London County Council failed to secure a majority of votes at the meeting on Tuesday. The subject will, no doubt, be indefinitely postponed.

**The Rev. J. H. Horrox**, vicar of Newchurch, has issued an appeal for funds towards the cost of placing in St. Mary's Church, Newchurch-in-Pendle, an east window in memory of Mr. W. Harrison Ainsworth, the novelist, who stayed at Newchurch parsonage to collect materials for his "Lancashire Witches." The scenes in that novel are almost exclusively laid in the parish of Newchurch.

**M. Carolus Duran** has painted on a wall of a small chapel in a forest near Saint-Aygulf the last scene of the "Crucifixion." The place is a holiday resort of the artist.

**The Formal Opening** of the great Nile reservoir and dam at Assuan will take place on December 10, and not on December 9, as had been reported. It is definitely settled that the Duke of Connaught will perform the ceremony. The invitations, which will number about 400, will be issued by the Egyptian Government.

**The Ancient Cloth Hall** at Newbury will be reopened on November 7 by the Master of the Clothworkers' Company, Mr. James Edward Horne. The hall has been restored as a memorial to Queen Victoria, and will in future be utilised as a local museum and art gallery. The building preserves fine wood-carving of the Jacobean period, and stands close to the market-place.

**The Musée Moreau**, which is the gift of the late Gustave Moreau, the painter, will be opened in Paris before the end of November. M. Paul Dubois will be president, and M. Léon Bonnat vice-president of the museum. M. Georges Rouault will be conservator.

**The Governors of Christ's Hospital** have obtained an order for the payment out of court of 150,000*l.*, part of the purchase money (233,000*l.*) in respect of a portion of the site of Christ's Hospital compulsorily acquired by the Governors of St. Bartholomew's Hospital. The money is required to pay for the new buildings to which the boys have been removed at Horsham.

**M. Chartran** has received a commission from the French Government for a large painting which is to represent the ceremony at the Panthéon on the occasion of the centenary of Victor Hugo. It is intended for the Historic Gallery of the Palace of Versailles.

**An Arrangement**, it is understood, has been entered into by which the difference between the Duke of Norfolk and the assessment committee respecting the valuation of Arundel Castle will be terminated. The advisers of the Duke recommended that the rateable value should be raised to 1,650*l.*, and the assessable value to 1,250*l.*

**The Executive Committee** for the Charlotte Yonge memorial have had under consideration Mr. Kempe's drawings and estimates for the proposed rood beam and chancel entrance in Otterbourne Church and the reredos in the lady chapel of Winchester Cathedral. The designs for the work at Otterbourne were approved, as also were those for the reredos, subject to such modifications in detail as may be suggested hereafter. The secretary has been authorised to take the necessary steps to obtain a faculty for the erection of the Otterbourne part of the memorial, but for the reredos, which is to cost 500*l.*, there is still 100*l.* to be subscribed.

**A Bill** will be introduced in the next session to authorise the construction of an underground electric railway from Hammersmith to the City, in connection with the Brompton and Piccadilly Railway Company and the authorised deep-level line of the District Railway.

**The Site** of the Temple of Hera, at Samos, has recently yielded twenty columns and an altar, the latter being in an almost perfect condition.

**Mr. John Faed, R.S.A.**, the Scottish painter, died in his eighty-third year on Wednesday. He was the elder brother of the late Thomas Faed, R.A. For a time he resided in London, but retired to Scotland in 1880.

**The Bronze Statue** of which pieces were dredged at Cerigo has been restored by M. André, the French sculptor. It now bears some resemblance to the *Hermes* of Praxiteles.

**The Decision** of the works committee of the Dundee Town Council disapproving of the plans of the proposed cancer hospital to be erected by Mr. J. K. Caird has been revoked, and the same plans are to be considered as approved.



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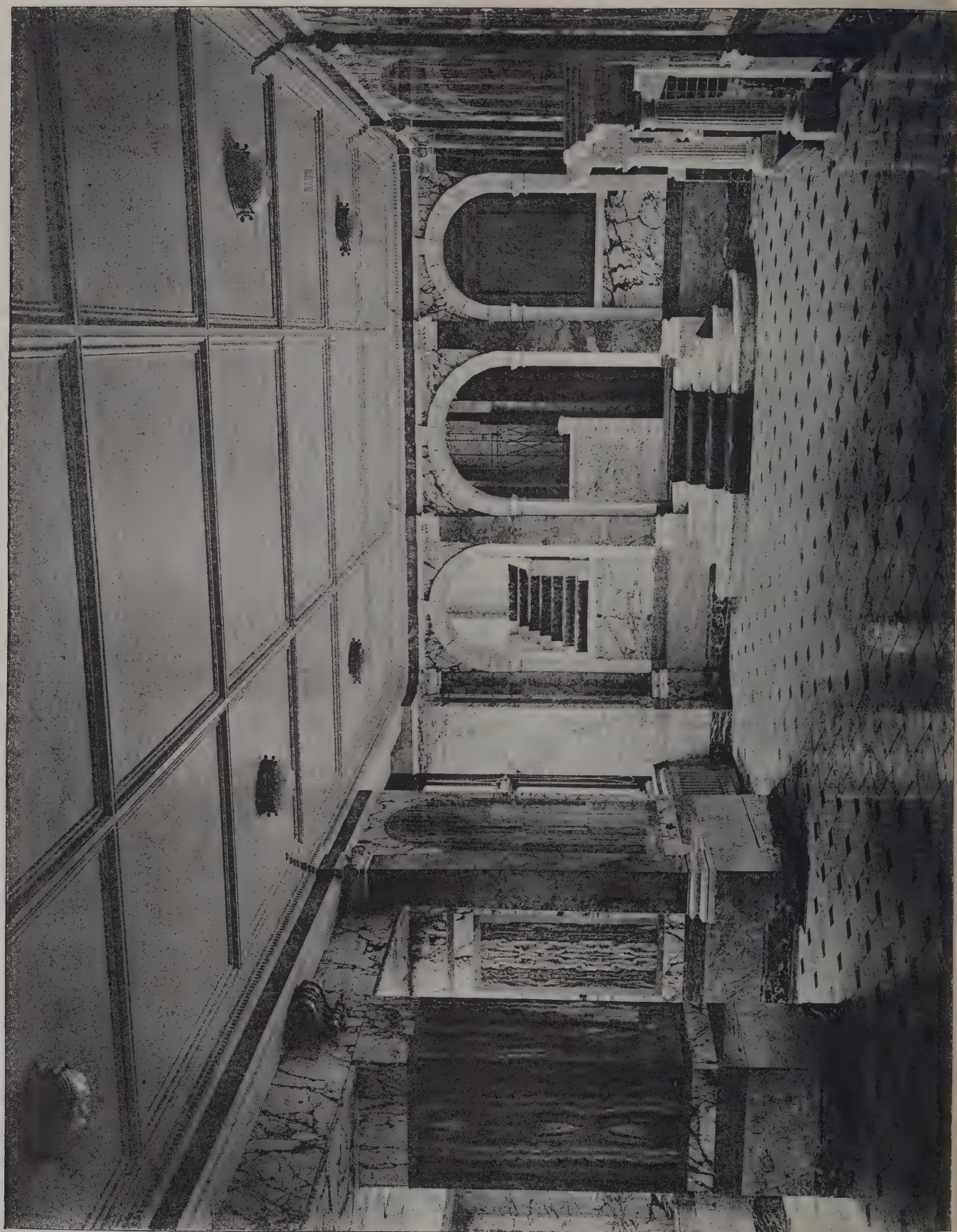
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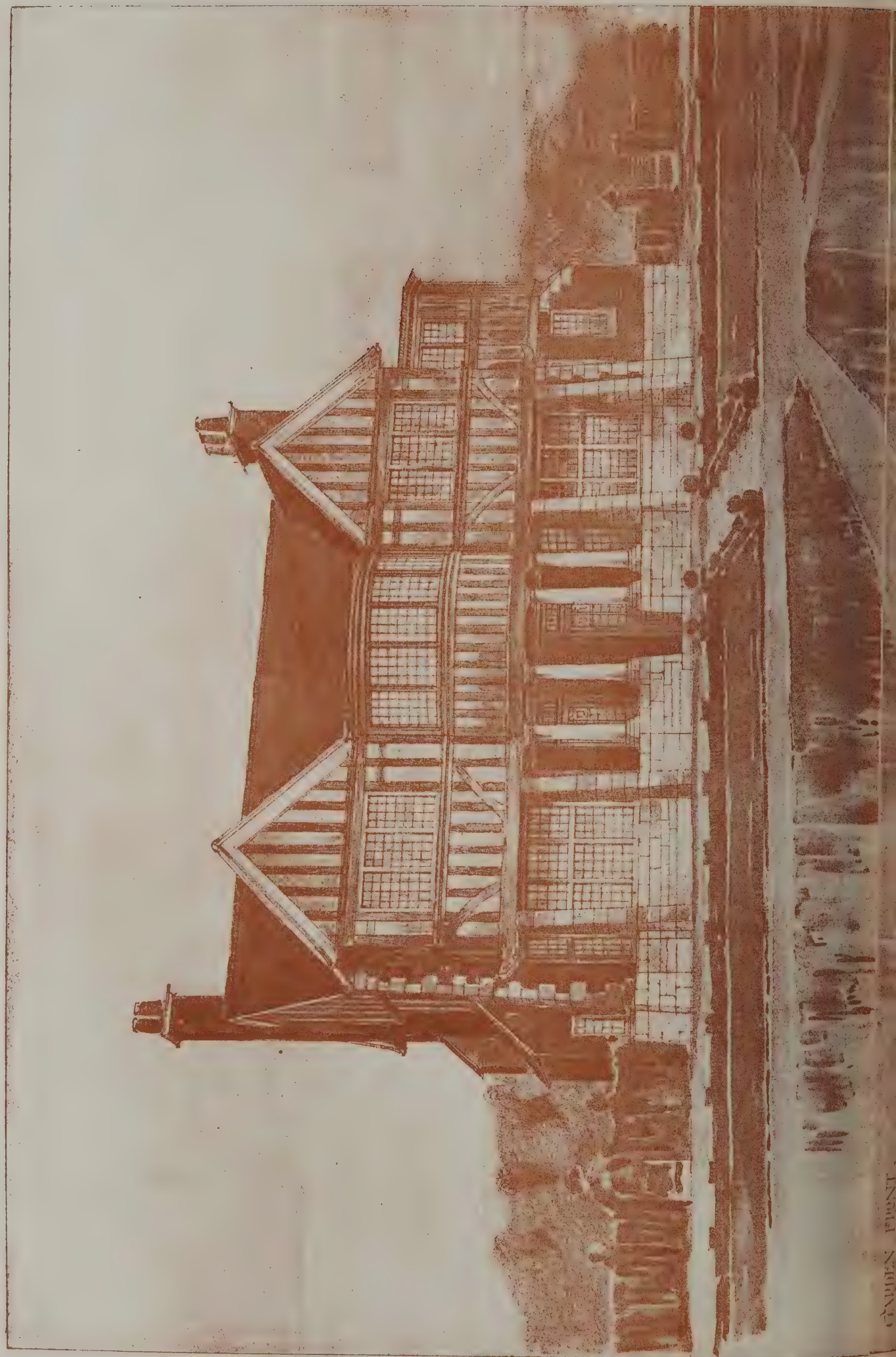
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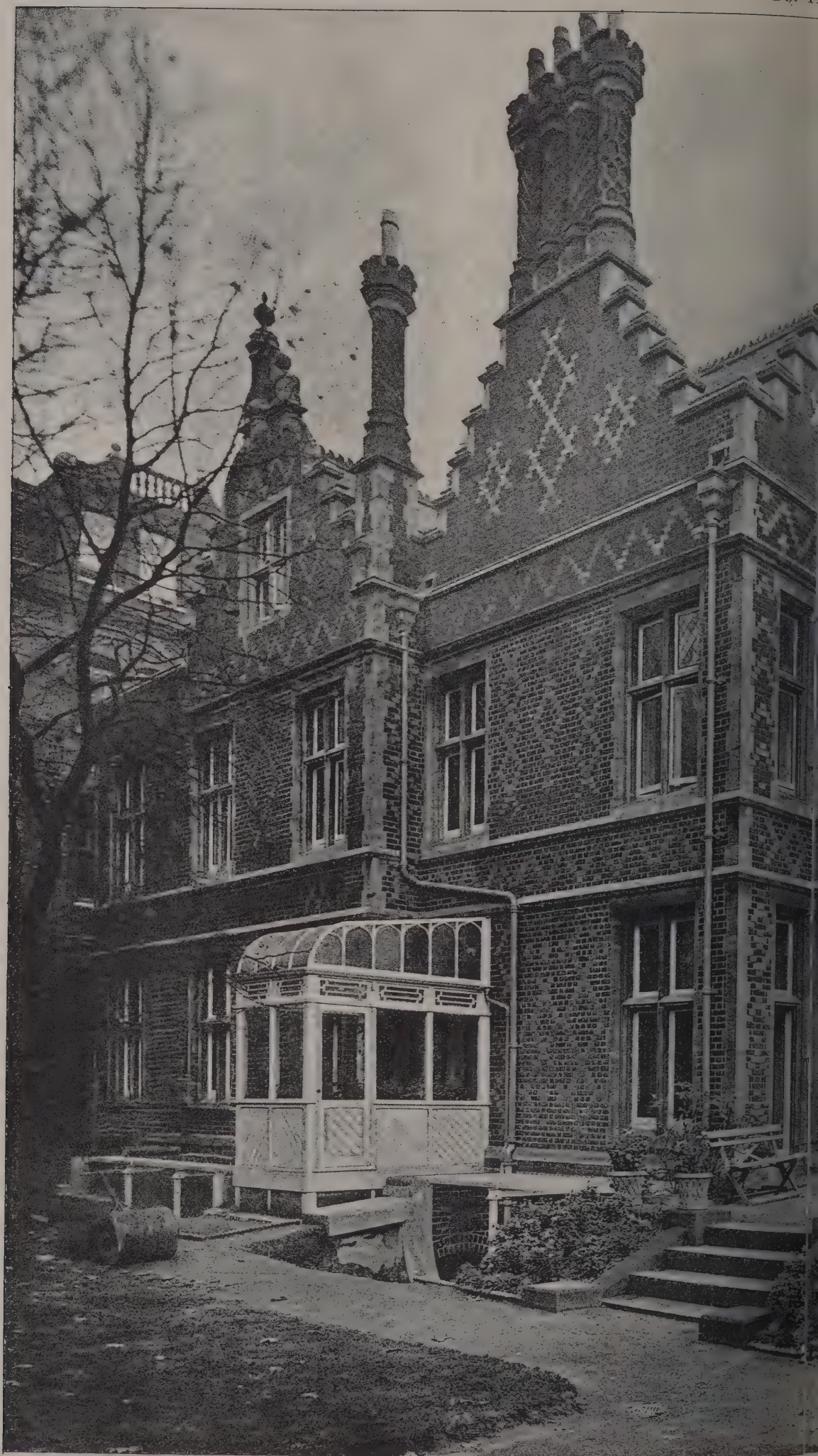


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THE

## Architect and Contract Reporter.

## EDITORIAL NOTICES.

*In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

## TENDERS, ETC.

*\*\* As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

## COMPETITIONS OPEN.

ASHTON-IN-MAKERFIELD.—Dec. 31.—Designs, &c., are invited for the enlargement of the Infectious Diseases Hospital. The architect whose plans are accepted and approved will be retained by the Council to carry out the work at the usual professional charges. Plan of the hospital site, together with full particulars of the alterations and extensions required, may be obtained from Mr. T. Burgess, surveyor, at the Council Offices.

CAPE TOWN.—Jan. 31.—The Council of the University of the Cape of Good Hope invite designs for the erection of university buildings. Premiums of 400*l.*, 200*l.* and 100*l.* will be awarded to the authors of the designs placed first, second and third respectively. Particulars of the competition may be obtained on application to the Registrar at Cape Town, or to the Agent-General in London.

DURBAN (NATAL).—Dec. 18.—Designs are invited for new town hall, library, museum, art gallery and municipal offices. Three premiums of 500*l.*, 300*l.* and 200*l.* respectively will be awarded for the three best designs in order of merit. Mr. W. H. Radford, C.E., Albion Chambers, Nottingham.

## CONTRACTS OPEN.

ASTON.—Oct. 31.—For condensers for electricity station. Mr. Reginald P. Wilson, 66 Victoria Street, London.

BANEURY.—For erection of a house and offices in Dashwood Road, Banbury. Mr. J. Timms, architect, 34 Bridge Street, Banbury.

BARNSELY.—Nov. 11.—For erection of outbuildings and conveniences at the Locke Park. Mr. J. Henry Taylor, borough surveyor, Manor House, Barnsley.

BATLEY.—Oct. 27.—For erection of four houses in Victor Street, Batley, Yorks. Mr. John H. Brearley, architect, Branca Road, Batley.

BECKENHAM.—Oct. 27.—For erection of a timber platform over the covered swimming-bath, 100 feet by 30 feet in area, with a movable stage, &c. Mr. John A. Angell, surveyor, Town Hall, Beckenham, Kent.

BECKERMET.—Oct. 30.—For erection of five houses at Beckermert, Cumberland. Mr. J. S. Stout, architect, 36 Lowther Street, Whitehaven.

BILDESTON.—Nov. 2.—For erection of a classroom to the Nedding and Naughton Board school. Mr. Robert Pannifer, Bildeston, Suffolk.

BILSTON.—Nov. 3.—For carrying-out the alterations and extensions of Lower Gornal Robert Street Infants' School, Coseley. Mr. A. Ramsell, architect, 187 Wolverhampton Street, Dudley.

BIRMINGHAM.—Nov. 15.—For erection of sanitary outbuildings at the old school block at the workhouse, Gravelly Hill. Mr. Cooper Whitwell, architect, 23 Temple Row, Birmingham.

BISHOP AUCKLAND.—Nov. 6.—For erection of an administrative block, main pavilion, isolation pavilion, porter's lodge and outbathing block, laundry and disinfecting block, covered ways, boundary walls and fences, water supply, drainage, roads, &c., at the No. 2 isolation hospital buildings at Helmington Row. Mr. William Perkins, architect, Victoria Street Bishop Auckland.

BRIGHTON.—Nov. 5.—For alterations to part of the Royal Pavilion in Palace Place to adapt the premises to the purposes of a telephone exchange, &c. Mr. Francis J. C. May, surveyor, Town Hall, Brighton.

BROMSGROVE.—Nov. 15.—For erection of the first portion of the proposed new lunatic asylum on the Barnsley Hall estate, near Bromsgrove, Worcestershire. Mr. George T. Hine, architect, 35 Parliament Street, Westminster.

BURTON-ON-TRENT.—Nov. 5.—For overhead equipment of the tramlines, &c. Messrs. Kincaid, Waller & Manville, 29 Great George Street, Westminster.

COALVILLE.—Nov. 4.—For supply and delivery of the pipes and specials required in the construction of new waterworks. Mr. J. B. Everard, 6 Millstone Lane, Leicester.

COALVILLE.—Nov. 4.—For supply and delivery of No. 192 sluice, air and reflux valves, No. 219 screw-down hydrants, No. 89 expansion joints, and No. 4 Deacon's waste-detecting meters, with other fittings, surface boxes, name plates and posts required in the construction of new waterworks. Mr. J. B. Everard, 6 Millstone Lane, Leicester.

COALVILLE.—Nov. 4.—For construction of a service reservoir to hold 500,000 gallons, the laying and jointing of mains, fixing fittings and testing and other work required in the construction of new waterworks. Mr. J. B. Everard, 6 Millstone Lane, Leicester.

COALVILLE.—Nov. 4.—For erection at the proposed new pumping station of two compound inverted tandem pumping engines, each capable of lifting not less than 240,000 gallons of water in twelve hours, and two steel Lancashire boilers, 6 feet 6 inches diameter, 20 feet long, including steam and water

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pipe connections and fittings, foundation bolts, plates and girders, overhead traveller, &c. Mr. J. B. Everard, 6 Millstone Lane, Leicester.

COCKERMOUTH.—Oct. 27.—For erection of a cart shed at the Castle Brewery. Messrs. Jennings Bros., Ltd., Castle Brewery, Cockermouth.

COCKERMOUTH.—Oct. 28.—For various works required in erection of a tower, new oak roofs and other alterations to St. Michael's Church, Arlecdon. Mr. J. H. Martindale, architect, Viaduct Chambers, Carlisle.

CREWE.—Oct. 28.—For erection of a diphtheria pavilion for twelve beds and other additions to the isolation hospital. Mr. G. E. Bolshaw, architect, 189 Lord Street, Southport.

DARTFORD.—Nov. 19.—For erection of a home for female attendants at the Darenth Asylum, Dartford, Kent. Messrs. Newman & Newman, architects, 31 Tooley Street, S.E.

DARTMOUTH.—Nov. 3.—For construction of about 2,500 feet of 9-inch earthenware pipe sewers, with manholes, lamp-holes, road gully, pits, &c. Mr. A. Smith, borough engineer and surveyor, Dartmouth.

DEWSBURY.—Oct. 29.—For erection of a schoolroom at St. John the Baptist Church, Dewsbury. Messrs. John Kirk & Sons, architects, Huddersfield.

DIDCOT.—Dec. 1.—For alterations and additions to the Board school at Didcot. Messrs. Hoare & Wheeler, architects, 17 Friar Street, Reading.

DONCASTER.—Oct. 27.—For erection of classrooms at the Doncaster Wesleyan schools, Oxford Place. Mr. E. H. Ballam, architect, Oriental Chambers, Doncaster.

EASTBOURNE.—Oct. 31.—For erection of two fire-escape staircases, &c., at the workhouse. Mr. F. G. Cooke, architect, 2 Hyde Gardens, Eastbourne.

EDMONTON.—Oct. 28.—For erection of a small lavatory and alterations in connection therewith at the union schools, Millfield House, Upper Edmonton. Mr. A. A. Kekwick, architect, 18-19 Outer Temple, Strand, W.C.

ELLENBOROUGH.—Oct. 31.—For erection of two dwelling-houses at Ellenborough, Cumberland. Mr. C. Eaglesfield, architect, Maryport.

GREAT YARMOUTH.—Oct. 31.—For erection of two houses, Marine Parade North. Mr. Chas. G. Baker, architect, Town Hall Chambers, Great Yarmouth.

GREENWICH.—Oct. 28.—For supplying and fixing a five-brake h.p. gas engine for chaff-cutting purposes, at the Council's depôt, Banning Street, East Greenwich. Particulars can be obtained from the Borough Engineer and Surveyor, Town Hall, Greenwich Road.

GREENWICH.—Oct. 29.—For the work of taking up the existing flooring of the dust shoot jetty at the Council's depôt, Banning Street, East Greenwich, and relaying the same with 3-inch pine. Mr. Francis S. Robinson, town clerk, Town Hall, Greenwich Road, S.E.

GREENWICH.—Nov. 18.—For supply and delivery of one 50-ton electric power overhead travelling crane, with auxiliary 20-ton hoist, and for the erection of same at the London County Council's electricity generating station. All particulars at the County Hall, Spring Gardens, London, S.W.

GUILDFOORD.—Nov. 3.—For supply of stoneware drain-pipes, Portland cement, brooms, brushes, &c. Mr. C. G. Mason, borough surveyor, Tunsgate.

HARROGATE.—For erection of a caretaker's house and stabling at the Roundhill reservoir, near Masham, Harrogate. Messrs. Bland & Bown, architects, North Park Road, Harrogate, Yorks.

HARROGATE.—Nov. 1.—For supply, delivery and erection of a hydraulic water-motor pump capable of lifting 150 gallons of water per minute to a height of about 100 feet, together with the necessary inlet, outlet, waste and suction pipes, also valves and other connections. Mr. Edward Wilson Dixon, engineer, 14 Albert Street, Harrogate.

HEREFORD.—Oct. 31.—For converting the Atlas Orphanage into a scattered home. Mr. W. W. Robinson, architect, 10 King Street, Hereford.

HILL END, ST. ALBANS.—Oct. 27.—For construction of drains, sewers, manholes, ventilators, sewage tanks, bacteriological filters, sewage and effluent pipes, water carriers, laying-out land, &c., in connection with the asylum. Mr. Baldwin Latham, engineer, Parliament Mansions, Victoria Street, Westminster.

HULL.—Oct. 29.—For erection of business premises, Lowgate, Hull. Mr. B. S. Jacobs, architect, Lincoln's Inn Buildings, Bowalley Lane, Hull.

IRELAND.—Oct. 29.—For additions and alterations to the Londonderry county and county borough infirmary. Mr. Albert E. Murray, architect, 37 Dawson Street, Dublin.

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IRELAND.—Oct. 31.—For rebuilding premises 52 South Mall, Cork. Messrs. W. H. Hill & Son, architects, Cork.

IRELAND.—Nov. 1.—For supplying and erecting about 500 yards of wrought-iron railings and eight gates round the Anderson Park, Coleraine. Particulars are obtainable from the Town Surveyor, Town Hall.

IRELAND.—Nov. 21.—For erection of new buildings at Gransha for the committee of management of the Londonderry district lunatic asylum. Mr. M. A. Robinson, Richmond Street, Londonderry.

ISLEWORTH.—Oct. 28.—For erection of vagrant wards at the workhouse at Isleworth. Mr. W. H. Ward, architect, Paradise Street, Birmingham.

KENDAL.—Oct. 28.—For erection of stables and reading-room, Hawkshead. Mr. J. Banks, surveyor, Kendal.

LEAVESDEN.—Nov. 5.—For erection of an isolation hospital at Leavesden Asylum, near Watford, Herts. Mr. T. Duncombe Mann, clerk, Metropolitan Asylums Board, Embankment, E.C.

LEEDS.—For enlargement of Christ Church schools, Upper Armley, Leeds. Messrs. Smith & Tweedale, architects, 12 South Parade, Leeds.

LEWISHAM.—Nov. 4.—For construction of underground sanitary conveniences at Lee Green and Catford. Particulars can be obtained at the Surveyor's Office, Town Hall, Catford S.E.

LEYTONSTONE.—Oct. 29.—For preparing, staining and polishing about 5,000 square yards of pitch-pine flooring at the new infirmary, Forest House, Leytonstone, N.E. Mr. F. E. Hilleary, clerk, Workhouse, Leytonstone, N.E.

LONDON.—Oct. 27.—For erection of patent concrete partition for the Acton Concrete Partition Co., Ltd. Mr. James Golding, secretary, 76 Finsbury Pavement, E.C.

LONDON.—Nov. 18.—For roadwork and platelaying required for the reconstruction on the conduit system for electric traction of the tramways:—(a) From the Elephant and Castle, *via* New and Old Kent Roads to East Greenwich; (b) from the Elephant and Castle, *via* Walworth Road, Camberwell Green, Church Street, Peckham Road and Queen's Road to New Cross Gate. Particulars from the Engineer's Department, London County Council, County Hall, Spring Gardens, London, S.W., on payment of 10% (returnable).

MANSFIELD.—Oct. 31.—For wiring the Town Hall premises for electric light. Mr. E. Holcombe Hewlett, at the Electric-Lighting Station.

MONTE VIDEO.—Dec. 15.—For the sanitary works to be carried out in Monte Video harbour. Works offered for tender include the following:—(a) A rock tunnel, 1,278 metres in length, 3m. 65 in height, and 3m. in width; (b) a main collector, 1,557 metres 60 by 1,283m. 30 in length, oval profiles 1'80m. and 1'11m. 70 in height respectively; (c) a secondary collector 2,016m. in length, varying its oval profiles from 1'70m, 1m. 25, and 0m. 98 in height; (d) the auxiliary collectors, affluents, &c. Plans, estimates and general conditions can be had in Monte Video by applying to the "Ministerio de Fomento," and through the respective Legations in Europe. Tenders made in Europe through the Legations in the above-mentioned countries should be handed to the said Legations at least one month before the mentioned date. Plans, &c., may be seen at the offices of the Consulate-General of Uruguay, Edinburgh Mansions, Howick Place, Victoria Street, S.W.

NEWCASTLE-ON-TYNE.—Oct. 31.—For erection of concrete tramway car-sheds at Wingrove, Newcastle-upon-Tyne. Mr. A. E. Le Rossignol, Manor Powers Station, Newcastle.

NEWCASTLE-ON-TYNE.—Nov. 6.—For supply and erection (complete) of a new triple-expansion direct-coupled engine of 3,000 horse-power at the power station, Newcastle-on-Tyne. Mr. A. E. Le Rossignol, general manager, Manors Powers Station.

NOTTINGHAM.—For installing the electric light at the Bath Street school. Messrs. Evans & Son, architects, Eldon Chambers, Wheeler Gate.

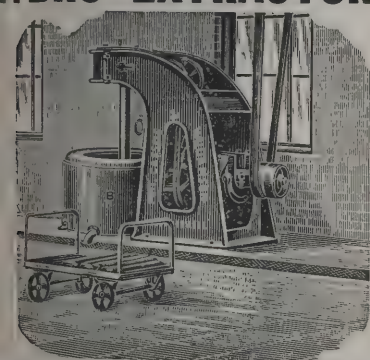
OGBOURNE ST. GEORGE (WILTS).—Nov. 8.—For supply, delivery and erection of pumping plant at the waterworks. The Borough Surveyor, Town Hall, Swindon.

RAMSGATE.—Oct. 30.—For erection of a 14-inch stock-brick wall, with the necessary excavation for solid foundation, &c., on the site of the proposed technical schools, The Elms. Mr. T. G. Taylor, borough surveyor, Albion House, Ramsgate.

REDRUTH.—Oct. 25.—For erection of a residence at Connor Downs. Mr. Sampson Hill, architect, Green Lane, Redruth.

ROTHERHAM.—Oct. 29.—For erection of a shed (for the storage of outside market stalls) in Market Street, Rotherham. Mr. H. Hampton Copnall, town clerk, Town Hall, Rotherham.

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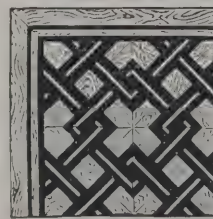
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SCOTLAND.—Oct. 27.—For erection of a combination infectious hospital at the east end of Old Rattray, the erection of boundary walls, &c. Messrs. L. & J. Falconer, architects, Blairgowrie.

SCOTLAND.—Oct. 27.—For alterations to dwelling-house, &c., at Mains of Orton. Messrs. Jenkins & Marr, architects, 16 Bridge Street, Aberdeen.

SCOTLAND.—Oct. 28.—For construction, supply and erection under one contract of the machinery and accessories required for the mechanical equipment of the machinery buildings at the Dalnair outfall works, Glasgow. Mr. David Howe Moreton, 130 Bath Street.

SCOTLAND.—Oct. 30.—For sewerage works and sewage purification works for the burgh of Dumfries. Mr. W. Allan Carter, 5 St. Andrew's Square, Edinburgh.

SCOTLAND.—Oct. 30.—For construction of an underground convenience at junction of Springburn Road and Balgray Road, Glasgow. Mr. J. Lindsay, clerk, Public Works Office, City Chambers, Glasgow.

SCOTLAND.—Nov. 1.—For furnishing Colinton Mains Hospital, Edinburgh, in four groups:—1, Bedsteads; 2, mattresses and pillows; 3, chairs, couches, &c.; and 4, tables, bedside stands, &c. Mr. R. Morham, city architect, Public Works Offices, City Chambers.

STAMFORD.—Oct. 27.—For erection of an infants' room at Greatford school, and removing and rebuilding the existing outer offices. Specifications and plans to be seen at the school or sent on application.

STIFFORD.—Oct. 30.—For alteration and enlargement of the existing Stifford Board school and erection of a new infant school and a teacher's and a caretaker's residence. Mr. Christopher M. Shiner, architect, Crutchedfriars, E.C.

SUDBURY.—Nov. 1.—For erection of machinery and destructor buildings at the sewage pumping station, Ballingdon Street, Sudbury, Suffolk. Mr. T. W. A. Hayward, borough surveyor, Town Hall, Sudbury.

SUMMERSEAT.—Oct. 27.—For reconstruction of the existing tanks, sludge filters, &c. Mr. James Diggle, Hin Hill Street, Heywood.

SUNDERLAND.—Nov. 28.—For supply of one steam-driven three-phase generator, motor generators and static transformers and high and low tension switchboards. Mr. J. F. C. Snell, electrical engineer, Town Hall, Sunderland.

WALES.—For erection of premises in Tunnel Court, Cardiff. Mr. Edgar G. C. Down, architect, 31 High Street, Cardiff.

WALES.—For erecting eleven houses at Old Box Yard, Llanelly. Messrs. J. Davies & Son, architects, Cowell House, Llanelly.

WALES.—Oct. 27.—For painting and repairing chapel and vestry, Abergwynfi. Mr. Job Williams, Jersey Road, Abergwynfi.

WALES.—Oct. 30.—For additions to the Pencllyn schools, Llangyfelach Mawr. Mr. W. David, architect, 97 Gorse Lane, Swansea.

WALES.—Nov. 3.—For erection of classroom, cloak-rooms boundary walls, &c., at Beaufort Hill Board school, Llangatock, Breconshire. Mr. Henry Waters, architect, Waengoch Beaufort.

WALES.—Nov. 4.—For erection of a mixed and infants' school (to accommodate about 400) at Ystradgynlais. Mr. Philip Williams, Tyr Gorof, Ystradgynlais.

WALES.—Nov. 5.—For erection of a chapel, Cwmllynfell, Glamorgan. Rev. J. Rees, Cwmllynfell.

WALES.—Nov. 6.—For erection of fog signal house, &c., at Nash Point, Glamorgan. Mr. Chas. A. Kent, secretary, Trinity House, E.C.

WALES.—Nov. 3.—For erection of a school, with master's house, boundary walls, roads, &c., at Aberbargoed. Messrs. James & Morgan, architects, Charles Street Chambers, Cardiff.

WALSALL.—Nov. 10.—For erection of cart-sheds, stables and other buildings, and alterations to existing buildings at Daw End, Rushall. Mr. Frederick W. Mager, district surveyor, Aldridge, Walsall.

WATERLOO-WITH-SEAFORTH.—Oct. 28.—For supply of gymnastic apparatus and for the erection and completion thereof in Victoria Park. Mr. F. Spencer Yates, surveyor, Town Hall, Waterloo.

WESTHOUGHTON.—For erection of a temporary iron and wood hospital for four beds, two male and two female, with accommodation for nurses, &c. Mr. Thomas Partington, clerk, Urban District Council, Westhoughton, Lancs.

WILLESDEN.—Nov. 11.—For erection of an assembly hall laboratories, &c., at the Polytechnic, Priory Park Road. Mr. H. T. Wakelam, county architect, Middlesex Guildhall, Westminster.

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WORKINGTON.—Oct. 28.—For erection of eight houses. Particulars may be obtained at 23 Fisher Street, Workington.

YORK.—Nov. 5.—For erection of station buildings, platforms, stationmaster's house and four cottages at Horden Colliery, eight cottages at Blackhalls and eight cottages at Easington, for the North-Eastern Railway Company. Mr. William Bell, architect, Central Station, Newcastle-on-Tyne.

## INTERNATIONAL FIRE EXHIBITION, EARL'S COURT, 1903.

At the executive meeting of the British Fire Prevention Committee held on the 15th inst., the announcement was made that the committee's preliminary arrangements for the International Fire Exhibition had been completed and the general programme finally decided upon. An eminently influential advisory council, representative of the great technical and fire interests and headed by the President of the Royal Society and presidents of the leading scientific institutions, has now been duly constituted and the various working sub-committees are in course of formation.

The hearty co-operation of the Duke of Marlborough, K.G., president, and the leading members of the National Fire Brigades Union, the officials of the Private Fire Brigades Association and St. John Ambulance Association has been assured, whilst the various continental fire authorities have promised active assistance.

The preliminary work for the Fire Congress to be held next year at the time of the exhibition has also now been started under the direction of Mr. Edwin O. Sachs, chairman of the Fire Prevention Committee. A number of important questions will be discussed at this conference, at which the leading authorities of all countries will be represented.

The exhibition will have the advantage of eminently interesting exhibits in the way of modern constructional and engineering work and the latest fire appliances, as also in the form of paintings, engravings and historical relics, so that the subject of fire protection, which is of so much interest to the Metropolis of late, will be most exhaustively treated in every way.

## TENDERS.

### BASFORD.

For street works in five streets at Ilkeston Junction. Mr. G. W. HAWLEY, surveyor, York Chambers, King Street, Nottingham.

S. Richmond & Co.	£1,295	1	7
S. Thumbs	1,199	9	4
Cox & Son	1,136	14	8
Thraves & Son	1,103	19	10
T. Smart	1,082	10	0
G. Goode	1,053	6	3
HAWLEY & SON, Ilkeston (accepted)	1,029	10	0
Cope & Raynor	1,029	6	7
W. A. Walker	1,019	0	1
W. Cordon	1,015	9	7

### BILSTON.

For erection of a public mortuary in Baldwin Street. Mr. J. P. WAKEFORD, surveyor.

H. T. Marchant, Bilston*	£191	0	0
Surveyor's estimate	195	0	0

\* Recommended for acceptance.

### BRADFORD.

For extension of the Rawson Place Markets.

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E. Fearnley & Son, Bradford, carpenter and joiner.  
J. B. Wear, Bradford, painter.

### CRADLEY HEATH.

For sewerage works in High Street, Z Street, Maughan Street, King Street and Bower Lane, with manholes, lampholes, &c. Mr. W. FIDDIAN, engineer, Old Bank Offices, Stourbridge.

T. Rowlands	£1,497	0	0
Cruwys & Hobrough	1,180	11	6
J. Mackay	1,096	1	2
T. Vale	1,092	9	6
J. A. Meredith	1,061	12	3
T. Allsopp	987	0	0
S. Saunders	982	17	0
E. BOORE, 275 Bearwood Road, Smethwick (accepted)	968	12	8

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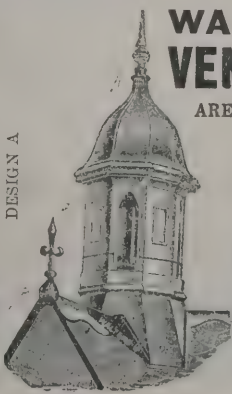
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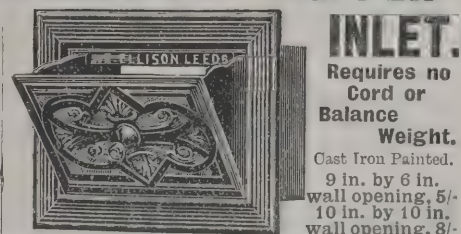
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J. Jackson . . . . .	12,108	0	0
Johnson & Langley . . . . .	11,791	0	0
B. Cooke & Co. . . . .	11,698	0	0
G. G. Rayner . . . . .	11,567	0	0
G. Bell . . . . .	11,379	0	0
J. & T. Binns . . . . .	11,278	0	0
J. Harris . . . . .	10,945	0	0
Streeter & Todhunter . . . . .	10,498	0	0
W. H. WHEELER, Blackfriars Road, S.E. ( <i>accepted</i> ) . . . . .	10,152	0	0

*Contract No. 2.—Engineering Work.*

HUGHES & LANCASTER, Westminster ( <i>accepted</i> ) . . . . .	6,148	0	0
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**FULHAM.**

For street works in Campbell Street. Mr. FRANCIS WOOD, borough surveyor.

*Accepted tenders.*

Nowell & Co., roadway . . . . .	£410	0	0
Indurated Stone Co., paving . . . . .	70	0	0

**HALIFAX.**

For street works in the borough of Halifax. Mr. LISTER COATES, architect, Yorkshire Bank Chambers, Waterhouse Street, Halifax.  
S. BEDFORD & SON, Saville Park (*accepted*) . £72 19 0

**IRELAND.**

For sewerage works in Church Road, Malahide. Mr. HUGH MILLING, engineer, Roseneath, Malahide.

W. Galvin . . . . .	£440	0	0
G. Dixon . . . . .	410	0	0
J. Kennedy . . . . .	240	0	0
T. Roddy . . . . .	235	0	0
M. Echlin . . . . .	230	0	0
J. Reid . . . . .	228	0	0
W. Lacy . . . . .	225	0	0
W. Baird . . . . .	225	0	0
P. BISSETT, Malahide ( <i>accepted</i> ) . . . . .	219	0	0
H. Henby . . . . .	215	0	0
L. Branagan . . . . .	198	0	0

**LANGTOFT.**

For erection of a school at Langtoft, East Yorkshire. Mr. JOSEPH SHEPHERDSON, architect, 14 Middle Street South, Driffeld.  
SAWDEN & SONS, Driffeld (*accepted*) . . £1,670 0 0

**LONDON.**

For erection of business premises at the corner of Newgate Street and Warwick Lane.  
B. E. NIGHTINGALE, Albert Embankment, S.W. (*accepted*) . . . . . £3,737 0 0

**C. B. N. SNEWIN & SONS, LTD.** MAHOGANY, WAINSCOT, AND TIMBER MERCHANTS, BACK HILL, HATTON GARDEN; & RAY ST., FARRINGTON ROAD, LONDON, E.C. Telephone 274 Holborn.

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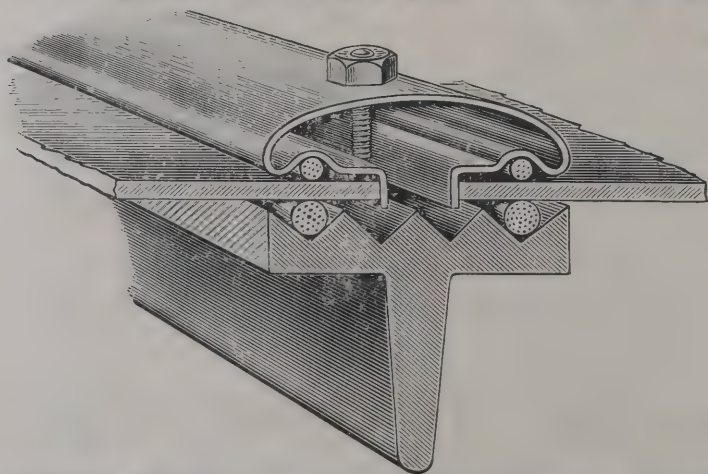
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LONDON SCHOOL BOARD.

For manual training centre for 40 children, with gymnasium over, Brownhill Road.		
F. & H. F. Higgs	£3,438	0 0
Rice & Son	3,343	0 0
W. J. Mitchell & Son	3,295	0 0
E. P. Bulled & Co.	3,293	0 0
J. Appleby	3,256	0 0
Holliday & Greenwood, Ltd.	3,183	0 0
E. Lawrance & Sons	3,178	0 0
J. & C. Bowyer	3,135	0 0
Treasure & Son	3,122	0 0
J. Smith & Sons, Ltd.	3,115	0 0
Johnson & Co.	3,107	0 0
T. D. Leng	3,004	0 0
W. Johnson & Co., Ltd.	2,961	0 0
J. & M. Patrick	2,920	0 0
J. Garrett & Son	2,912	0 0
Thomas & Edge*	2,760	0 0

For new school, accommodation—Boys, 380; girls, 380; infants, 382, Sandhurst Road.

T. L. Green	£26,748	0 0
W. Downs	26,279	0 0
Patman & Fotheringham, Ltd.	25,376	0 0
W. Johnson & Co., Ltd.	25,023	0 0
W. J. Mitchell & Son	24,825	0 0
E. Lawrance & Sons	24,813	0 0
G. E. Wallis & Sons	24,682	0 0
Stimpson & Co.	24,460	0 0
C. Miskin & Sons	24,425	0 0
J. Smith & Sons, Ltd.	24,379	0 0
J. & C. Bowyer	24,299	0 0
Treasure & Son	24,083	0 0
F. & H. F. Higgs	23,983	0 0
J. Garrett & Son	23,896	0 0
J. Marsland & Sons	23,662	0 0
J. & M. Patrick	22,982	0 0
Holliday & Greenwood, Ltd.*	22,925	0 0

For providing and fixing heating and cooking apparatus, &c., Linden Lodge.

W. G. Cannon & Sons	£119	0 0
BENHAM & SONS, LTD. (accepted)	46	10 0

\* Recommended for acceptance.

LONDON SCHOOL BOARD—continued

For enlargement—boys, 50; girls, 50; infants, 50. Heating by open fires, Old Woolwich Road.

Killby & Gayford	£1,946	0 0
J. Appleby	1,903	0 0
T. L. Green	1,839	0 0
W. H. Lorden & Son	1,788	15 0
Rice & Son	1,784	0 0
E. P. Bulled & Co.	1,755	0 0
F. & H. F. Higgs	1,753	0 0
J. Smith & Sons, Ltd.	1,742	0 0
J. Garrett & Son	1,729	0 0
J. Greenwood	1,670	0 0
W. Johnson & Co., Ltd.	1,661	0 0
J. & C. Bowyer	1,646	0 0
E. Triggs	1,580	0 0
T. D. Leng*	1,520	0 0

For improvements to infants' school, Bonner Street.

H. Wall & Co.	£3,270	0 0
Snewin Bros. & Co.	3,160	0 0
W. M. Dabbs	3,147	0 0
W. Gregar & Son	3,047	0 0
W. Shurmur & Sons, Ltd.	3,033	0 0
Marchant & Hirst	2,978	0 0
J. Grover & Son	2,962	0 0
Patman & Fotheringham, Ltd.	2,952	0 0
C. Cox	2,886	0 0
McCormick & Sons	2,794	0 0
E. Lawrance & Sons	2,747	0 0
G. S. S. Williams & Son	2,629	0 0
C. Dearing & Son	2,512	0 0
Treasure & Son (London and Shrewsbury)*	2,444	0 0

For providing and fixing independent boiler and extending apparatus to classrooms D (girls and infants), including cutting-out tubular boiler and altering coils, Redvers Street.

J. Fraser & Son	£181	0 0
J. Wontner-Smith, Gray & Co.	136	0 0
R. Clarke	126	0 0
Stevens & Sons	126	0 0
J. Grundy	125	0 0
W. Simmonds	109	0 0
J. & F. May	105	10 0
J. DEFRIES & SONS, LTD. (accepted)	89	0 0

\* Recommended for acceptance.

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## LONDON SCHOOL BOARD—continued.

For altering and refitting all offices with separate pan closets; refitting all lavatories and providing new drainage, Hawley Crescent.

G. Godson & Sons	£2,921	0	0
C. W. Killingback & Co.	2,884	0	0
Marchant & Hirst	2,751	0	0
Maxwell Bros., Ltd.	2,662	0	0
McCormick & Sons	2,589	0	0
Johnson & Co.	2,401	0	0
G. Neal	2,274	0	0
G. S. S. Williams & Son	2,206	0	0
J. Peattie	2,159	10	0
R. P. Beattie	2,155	5	5
F. Bull *	2,126	0	0

For removing existing partitions and providing sliding glazed partitions to redivide classrooms D and E into three rooms, reversing the stepped flooring in same classrooms to obtain left lighting, altering doorways and lengthening windows, building buttress and piers to strengthen the main walls, Rushmore Road.

T. L. Green	£719	0	0
London School Furniture Co.	712	16	6
W. Martin	679	0	0
McCormick & Sons	640	0	0
E. Lawrance & Sons	604	0	0
Barrett & Power	598	0	0
F. & F. J. Wood	597	0	0
Marchant & Hirst	539	0	0
F. Bull *	497	0	0

For providing and fixing complete low-pressure hot-water apparatus to fifteen classrooms, three halls, cloakrooms, corridors and lavatories (all departments); also to drawing classroom on third floor, Church Manor Way.

J. Williams & Sons (Cardiff), Ltd.	£690	0	0
Strode & Co.	633	0	0
R. Clarke	626	0	0
Wippell Bros. & Row	625	0	0
Wenham & Waters, Ltd.	580	0	0
B. Harlow & Son	557	0	0
J. & F. May	550	0	0
M. Duffield & Son	498	0	0
J. Grundy	497	0	0
Werner, Pfeiderer & Perkins, Ltd.*	474	0	0

\* Recommended for acceptance.

## LONDON SCHOOL BOARD—continued.

For physically defective centre for 40 children (two classrooms of 20 each), Surrey Square.

Rice & Son	£2,887	0	0
J. Garrett & Son	2,849	0	0
F. & H. F. Higgs	2,755	0	0
E. P. Bulled & Co.	2,687	0	0
W. Smith & Son	2,660	0	0
J. Greenwood	2,610	0	0
W. Downs	2,607	0	0
W. H. Lorden & Son	2,555	0	0
W. Johnson & Co, Ltd.	2,551	0	0
Lathey Bros.	2,487	0	0
Stimpson & Co.	2,450	0	0
J. Outhwaite & Son	2,418	0	0
Johnson & Co.	2,412	10	0
T. D. Leng	2,341	0	0
J. Marsland & Sons *	2,331	0	0

## LUTON.

For erection of a Congregational church, Bury Park, Luton.

T. & E. NEVILLE & Co. (accepted)	£4,429	0	0
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## NANTWICH.

For alterations and additions to the workhouse, Nantwich. Mr. C. E. DAVENPORT, architect, Hospital Street, Nantwich.

J. Williams & Sons	£235	0	0
J. F. Heywood	210	0	0
Cox & Vaughan	199	10	0
J. T. GRESTY, Willaston, Nantwich (accepted)	198	10	0

## PAIGNTON.

For proposed alterations and additions to Halcon, Paignton, for Dr. C. Hyde Cosens. Messrs. BRIDGMAN & BRIDGMAN, architects, Torquay and Paignton.

E. Westlake	£211	10	0
C. & R. E. DREW, Paignton (accepted)	198	4	6

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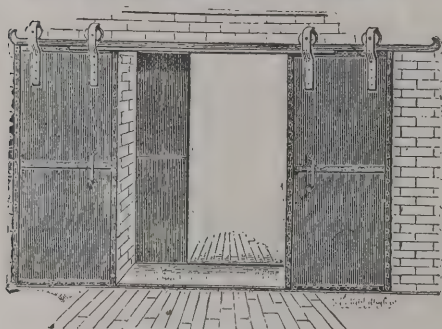
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PAIGNTON—continued.

For proposed alterations and additions to Nos. 3 and 5 Victoria Street, Paignton, for the Wilts and Dorset Banking Company, Ltd. Messrs. BRIDGMAN & BRIDGMAN, architects, Torquay and Paignton. Quantities by Mr. VINCENT CATTERMOLLE BROWN, Paignton.

Laphorn & Co. . . . .	£2,160	0	0
Mitchell & Sons . . . . .	1,975	0	0
F. A. Stacey . . . . .	1,900	0	0
J. C. & W. Watson . . . . .	1,780	0	0
Hugh Mills . . . . .	1,734	0	0
C. & R. E. Drew . . . . .	1,700	0	0
Herbert Drew . . . . .	1,630	0	0
W. Blake . . . . .	1,600	0	0
J. C. Parker & Sons . . . . .	1,600	0	0
H. WEBBER & SONS, Paignton (accepted)	1,500	0	0

PENZANCE.

For erection of a lavatory in the Princes Street markets. Mr. FRANK LATHAM, borough engineer.

Accepted tenders.

J. H. Nicholas, 10 Tolver Road, promenade lavatory . . . . .	£240	7	0
E. Pidwell, Green Bank, markets lavatory . . . . .	129	9	6

ROCHDALE.

For sewerage works in Bury Road and Hope Street, and through private lands at Marland, in the Castleton Moor district. Mr. S. S. PLATT, borough surveyor.

J. MOORE, 23 Entwisle Road (accepted).

SCOTLAND.

For erection of town hall and public library at Bo'ness. Messrs. PEDDIE & WASHINGTON BROWNE, architects, 8 Albyn Place, Edinburgh.

Accepted tenders.

Barker & Peattie, Bo'ness, mason . . . . .	£6,002	16	1
W. Morrison, Bo'ness, plasterer . . . . .	669	16	7
C. Anderson, Bo'ness, plumber . . . . .	350	2	0
R. Kilpatrick, Bo'ness, slater . . . . .	191	0	1
J. Yonden & Co., Ltd., Glasgow, tiler . . . . .	185	2	8

SCOTLAND—continued.

For additions to asylum, Woodilee, Lenzie, Glasgow. Messrs. JAMES SALMON & SON, architects, 53 Bothwell Street, Glasgow.

Brick, &c., works.

Goldie & Son . . . . .	£8,807	4	0
Gilchrist & Son. . . . .	8,634	0	0
Murdoch & Son . . . . .	8,218	0	0
Paterson & Son, Ltd. . . . .	7,911	7	4
J. Kirkwood . . . . .	7,413	0	0
J. J. & P. McLachlan . . . . .	6,965	11	3
Shaw & Son . . . . .	6,844	5	9
FORREST & MCLEOD, Glasgow (accepted)	6,463	6	11

Wright, &c., works.

Guthrie & Co. . . . .	5,250	0	0
Shaw & Son . . . . .	5,158	19	2
Laird & Son . . . . .	5,130	1	4
Miller & Murray . . . . .	5,026	7	0
J. Peter . . . . .	4,993	15	9
Baxter & Sons . . . . .	4,663	6	5
NIVEN & SONS, Glasgow (accepted)	4,540	7	10

SLIGO.

For construction of two water-closets in connection with the maternity ward of the workhouse.

J. Galloway & Sons . . . . .	£39	0	0
E. Crummy . . . . .	24	10	0
M. O'HARA (accepted) . . . . .	20	15	0

SWANLAND.

For sewerage works at Swanland, near Hull. Mr. WILLIAM H. WELLSTED, engineer, Prince's Dock Chambers, Hull.

H. Medforth . . . . .	£99	11	0
T. Bell . . . . .	73	7	9
Boyce, Bradley & Co. . . . .	55	6	0
W. Barnard . . . . .	52	3	6
KIRBY & SON, Swanland (accepted)	51	15	10

SWANSEA.

For supply of one 40-kw. continuous-current motor-balancer. BRITISH SCHUCKERT Co, Clun House, Surrey Street, Strand, London (accepted).

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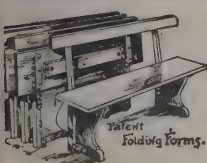
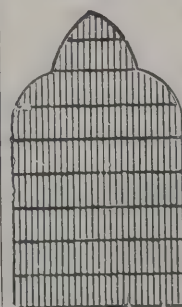
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walls, for Social Gatherings, Drill, &c.  
tire satisfaction where in use.

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## TRURO.

For erection of river wall opposite the Green and construction of about 60 lineal yards of 3 feet diameter barrel culvert at Boscawen Park.

E. SANDOE, St. Austell Street (*accepted*).

## TORQUAY.

For proposed alterations and additions to Nos. 79 and 81 Union Street, Torquay, for the Torquay Co-operative Society, Ltd. Messrs. BRIDGMAN & BRIDGMAN, architects, Torquay and Paignton. Quantities by Mr. VINCENT CATTERMOLLE BROWN, Paignton.

S. Hawkins & Son	£3,505	0	0
J. Smerdon	3,390	0	0
R. F. Yeo & Sons	2,999	11	3
S. Blatchford	2,864	0	0
J. C. & W. Watson	2,720	7	3
E. Pike	2,710	0	0
J. MUMFORD, Torquay ( <i>accepted</i> )	2,611	0	0
R. W. Wyatt	2,519	0	0

## WALES.

For erection of thirty-five houses at Ystrad Mynach. Mr. T. W. MILLER, architect, Mountain Ash.

T. F. Howells	£5,705	0	0
Hamilton & Millard	5,600	0	0
C. Sara	5,600	0	0
R. Jones	5,582	10	0
J. Lewis	5,550	0	0
J. Williams	5,495	0	0
Thomas & Hughes	5,337	10	0
WILLIAMS & CO, Monthermer Road, Cardiff ( <i>accepted</i> )	5,241	5	0

For erection of fifty houses in Aber Bargoed. Mr. G. KENSHOLE, architect, Station Road, Bargoed.

H. R. Paul	£9,000	0	0
W. Thomas & Co.	8,950	0	0
R. Jones	8,875	0	0
J. Williams	8,550	0	0
J. Davies	8,350	0	0
J. James & Sons	8,290	0	0
W. Morris	8,147	10	0
C. Sara	8,000	0	0
Thomas & Hughes	7,875	0	0
W. WILLIAMS & SONS, New Tredegar ( <i>accepted</i> )	7,737	10	0

## WALES—continued

For erection of the Newport Borough lunatic asylum at Caerleon, Monmouthshire. Mr. A. J. WOOD, architect, 22 Surrey Street, Victoria Embankment, W.C. Quantities by Messrs. WIDNELL & TROLLOPE, 20 Tothill Street, Westminster, S.W.

J. McCormick	£123,288	0	0
Kerridge & Shaw	118,410	0	0
Chas. Wall	117,000	0	0
Watkin Williams	116,990	0	0
D. W. Davies	115,000	0	0
Johnson & Co.	110,850	0	0
A. S. Morgan & Co.	110,500	0	0
Turner & Sons	109,250	0	0
J. Allan & Sons	109,000	0	0
W. King & Son	108,218	0	0
H. Willcock & Co.	107,875	0	0
J. Linton & Co.	105,999	0	0

## Revised tenders.

J. Linton & Co.	97,900	0	0
H. Willcock & Co.	96,865	0	0
W. King & Son	96,798	0	0

## Electric plant.

BERTRAM THOMAS, Manchester ( <i>provisionally accepted</i> )	3,433	0	0
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## Wiring and fittings.

LOWDON BROS. & CO., Dundee ( <i>provisionally accepted</i> )	2,500	0	0
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For erection of public conveniences at Beresford Road and Fair oak Road, Roath, Cardiff. Mr. W. HARPUR, borough engineer.

## Beresford Road convenience.

F. Small	£218	3	0
A. W. Cadwallader	207	8	8
Gough Bros.	177	18	8
W. T. Morgan	176	8	10
KNOX & WELLS, Cardiff ( <i>accepted</i> )	165	18	3

## Fair oak Road convenience.

F. Small	161	13	0
A. W. Cadwallader	160	17	1
Gough Bros.	125	15	2
W. T. Morgan	126	7	4
KNOX & WELLS, Cardiff ( <i>accepted</i> )	121	3	8

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WALES—continued.

For street works at Cwmbran. Messrs. B. LAWRENCE & SON, architects, Newport.

Road.

Meredith & Co.	£3,196	0	0
Leadbeter Bros.	2,242	0	0
W. A. Linton	2,165	0	0
L. R. Lucas	2,256	3	0
Geen & Linton	2,134	15	3
D. Parfitt	1,887	0	0
H. C. Parfitt	1,770	0	0
C. H. REED (accepted)	1,733	0	0
Davies (whole tender)	2,150	0	0

Bridge.

L. R. Lucas	256	19	6
Meredith & Co.	198	0	0
D. Parfitt	185	0	0
Geen & Linton	171	3	8
H. C. Parfitt	168	0	0
W. A. Linton	148	0	0
Leadbeter Bros.	123	0	0
C. H. REED (accepted)	121	0	0

Fence.

Meredith & Co.	822	10	0
W. A. Linton	485	0	0
Leadbeter Bros.	482	0	0
Geen & Linton	480	10	0
D. Parfitt	470	0	0
C. H. REED (accepted)	445	0	0
H. C. Parfitt	444	0	0
L. R. Lucas	395	15	0

WELSHPOOL.

For erection of a cottage hospital. Mr. FRANK H. SHAYLER, architect, Bridge House, Welshpool.

G. Bullock	£1,627	0	0
E. H. Nicholas	1,593	0	0
R. Price & Sons	1,590	0	0
M. Felton	1,559	10	0
M. H. Thomas	1,499	0	0
E. DAVIES, Welshpool (accepted)	1,358	0	0

WEST HAM.

For street works in Inniskilling Road, Jedburgh Road (part), Upperton Road (part), Sutton Court Road (part), Haigh Road (part). Mr. J. G. MORLEY, borough engineer.

Lawrence & Thacker	£2,747	0	0
J. Jackson	2,194	6	8
W. H. Wheeler	2,171	3	9
T. Adams	2,160	12	11
W. Griffiths & Co., Ltd.	2,160	3	9
G. J. Anderson	2,033	2	5
W. Manders	1,892	5	9
D. T. Jackson	1,850	6	0
PARSONS & PARSONS, Ilford Wharf, Ilford (accepted)	1,836	17	7

YORKS.

For erection of two dwelling-houses in Castleford Road, Normanton, and one dwelling-house at Whitwood. Mr. ARTHUR HARTLEY, architect, Castleford.

Accepted tenders.

For one house, Whitwood.

Gallagher Bros, Morrison Street, Castleford, builder.  
T. G. Wright & Son, 16 Oxford Street, Castleford, joiner.  
W. P. Allison, Beancroft Street, Castleford, slater.  
J. Lockwood, Staincliffe, near Dewsbury, plasterer.  
S. Hardy, Normanton, plumber.

For two houses, Normanton.

W. H. Ramskill, Pontefract Road, Castleford, builder.  
J. Perry & Sons, Lock Lane, Castleford, joiner.  
W. P. Allison, slater.  
J. Lockwood, plasterer.  
S. Hardy, plumber.

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## TRADE NOTES.

THE Baptist schools, East Finchley, have recently been fitted with the latest improved hot-water heating apparatus, by Messrs. John King, Ltd, engineers, Liverpool.

THE City of Sheffield Hospital, Lodge Moor, is being warmed and ventilated by means of Shorlands' double-fronted patent Manchester stoves in glazed faience, and under-bed ventilators, by Messrs. E. H. Shorland & Brother, of Manchester.

THE CHERRY TREE MACHINE CO., LTD, engineers and ironfounders, Cherrytree, near Blackburn, have just supplied one of their metal rotary steam-pressure washing machines to the Royal Naval Hospital, Plymouth, for the Lords Commissioners of the Admiralty.

THE COLUMBIAN FIREPROOFING CO., LTD., 37 King William Street, E.C., have commenced their contract for fire-proof floors and roofs at the Kirkcaldy electric generating station for the Kirkcaldy Corporation, and have now virtually completed their large job of floors and roofs at the electric generating station at Bow, for the Charing Cross and Strand Electricity Corporation, Ltd.

MESSRS. GEORGE JENNINGS, LTD., Lambeth Palace Road, S.E., have at present in hand the sanitary work and drainage at Messrs. Gooch's new premises in the Brompton Road, S.W., under the architects, Messrs. Ford, Son & Burrows. They are also executing the sanitary work, drainage, &c., at the Bank of England's new premises for the National Debt, and offices in Old Jewry and Princes Street, City, for Mr. A. C. Blomfield, architect.

IN the old church of Fridaythorpe, East Yorks, now being restored by Sir Tatton Sykes, Bart., Sledmere, a new clock is to be erected as a memorial to the late Mr. Sellers, of York. The trustees have placed the order with Messrs. Wm. Potts & Sons, of Leeds and Newcastle-on-Tyne, who are now making some clocks for South Africa.

THE convenient portable telescopic ladder towers of Heathman & Co., at Parson's Green, S.W., are receiving the adoption they deserve. The War Department recently ordered fifty, and all have been delivered, rigidly examined and tested, and not one rejected. Visitors to the State apartments of Windsor Castle can see these Heathman portable scaffold towers, as two sets are invariably in use in one or other of the rooms, and prove a great convenience for

cleaning the cornices and ceilings. It is claimed that some 70% was saved in the employment of one for men to clean the armour hung in Hampton Court Palace; some 30% was saved through the use of one for hanging sun-blinds under skylights at the National Gallery, and a similar sum at the Royal Gallery of British Art. At the Café Monico the cost of a set was saved in the restoration of the ceiling of the grand dining saloon, since which they have been used in all the other rooms of the building. A set is kept at the Portman Rooms in Baker Street, and put into annual use for cleaning the painted ceilings.

## ELECTRIC NOTES.

THE Colchester Council have adopted the system of overhead electric trams at an outlay of nearly 70,000*l.*, refusing to have anything to do with any outside company.

ON the 20th inst. Councillor Amos Chippindale, as chairman of the Harrogate electric-light committee, at a Local Government Board inquiry before Major C. E. Norton, gave particulars respecting the increase in the use of electricity in Harrogate. In 1897, when the works were first opened, they supplied equal to 8,700 candle-power, whilst last year the amount had increased to 41,800. During the first two years the undertaking involved a loss of 1,997*l.*, on the third year there was a profit of 777*l.*, the following year 1,046*l.*, and last year there was a profit of 1,758*l.*, after repaying interest and capital. Of this 73% had gone towards the relief of the local rates. The inquiry was to obtain sanction to borrow 46,000*l.* for the purpose of extension of plant to meet the increasing demand. There was no opposition.

THE Leyton Urban District Council announce that it has made a profit on its electric-light supply station during the past six months of 700*l.* According to a statement just made by the Council's electrical engineer, Mr. F. H. Lewis, the rate-payers in this district are in possession of a rapidly increasing asset of considerable value, as represented by the electric-lighting station and plant. Whereas in 1897—the year in which the station was inaugurated—there were only 2,982 lamps connected with the system, and 28,591 units sold in the twelvemonth, at present there are 40,000 lamps connected, and the financial year now closed saw a total of 811,141 units sold. To provide for this enormous increase in the output of electricity, the Council is at present having laid down an extensive plant of steam-engines, having had to discard the use of gas-

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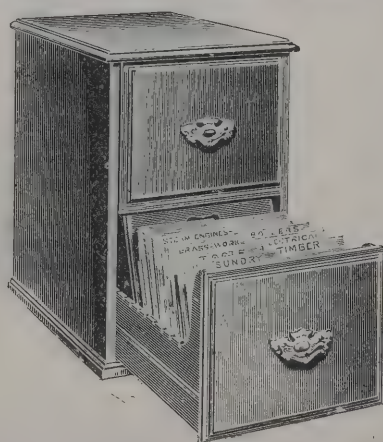
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1 x 4 $\frac{1}{2}$ " ditto	at 42 <i>s.</i> 6 <i>d.</i> "
1 $\frac{1}{2}$ x 4 $\frac{1}{2}$ " Pitch Pine	at 23 <i>s.</i> 0 <i>d.</i> "
1 x 4 $\frac{1}{2}$ " ditto	at 12 <i>s.</i> 6 <i>d.</i> "

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engines upon an injunction of the High Court. There are already laid down five steam-engines of 360 horse-power each, and workmen are now putting in a sixth engine, which will generate 700 horse-power and work an extra large dynamo just purchased. In the adjoining township of Walthamstow the District Council's electric-lighting station contains equally powerful engines, and though this station was opened only a year ago it was described at the Council meeting on the 20th inst. as "already a little gold mine for the ratepayers."

### VARIETIES.

PRINCESS CHRISTIAN OF SCHLESWIG-HOLSTEIN will open Brentford's new workhouse, which has been erected at Isleworth at a cost of 100,000*l.*, on Tuesday, November 4.

At the village of Swanscombe, Kent, a manse for the minister of the Congregational church is being built by the free labour of young men who are associated with the church, and who are also connected with the building trade.

The directors of the London and Lancashire Fire Insurance Company have declared an interim dividend of 5*s.* per share (as compared with last year's interim dividend of 4*s.* per share), payable on November next.

The body of Mr. James Casey, town clerk of Tralee, was found on the shore at Spa, four miles from Tralee. Mr. Casey, who was subject to fits, is believed to have been taken ill when walking on the beach.

The Roman Catholic church of St. Mary at Malton has been reopened after undergoing complete restoration. The church has had a new floor and new roof constructed, has been relighted and reseated, and a new interior porch and several new rooms erected. The work of restoration has cost 300*l.*

A SYSTEM of water supply for Ripponden, Soyland Town and Mill Bank has just been completed by the Soyland District Council. The reservoir, which is situate at Black House Farm, has a water area of 1½ acre, and a holding capacity of nearly seven million gallons. Altogether the scheme, including works and land, has cost 17,500*l.*

The Bishop of Shrewsbury (Dr. Allen) opened the new Catholic church of St. Mary, Latchford, Warrington, on Monday. The church, which accommodates 600 persons, has been erected in St. Mary Street, and adjoins the schools, which up to the present have also been used as a church. It is

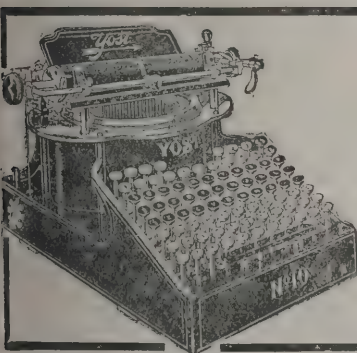
intended at some future time to erect a tower and spire. The cost has been about 6,000*l.*

*Commercial Intelligence*, Mr. H. Sell's very useful trade weekly, celebrates with its this week's issue its fourth anniversary. We are glad to see that the high standard of useful information aimed at in the first number has been fully maintained, and notice that among the valuable matter comprised in the present issue is an interesting article on the "Past Steamship Service to Canada."

A GOOD deal of work is going on at Osborne, in view of the changes which are to take effect early next year. Although tons of statuary and other art treasures have been removed to Buckingham Palace and Windsor in a dozen or more pantech-nicon vans, there is still a magnificent display remaining in the late Queen's island home. Until the transfer has been effected Osborne remains under the control of the Keeper of the King's Privy Purse. What is known as the Household Wing will be used for the purposes of the convalescent hospital for army and naval officers.

THE London School Board have decided to introduce the following regulation for insurance by builders:—"In the event of any property being subjected to special risk from fire by reason of work being done on the premises by a contractor, it shall be the duty of the Works Department to communicate with the Accountant's Department. If the property be insured in the Board's Fund, the contractor shall be required to insure it in an insurance office during the progress of the work, and the insurance in the Board's Fund shall automatically cease pending the continuance of this insurance. If the property be already insured in an insurance office, that office shall be advised of the work, and any additional premium which may be charged to cover the special risk shall be paid by the contractor."

THE new Opera House at Tunbridge Wells was formally opened on the 16th inst. It provides seating accommodation for 1,100, has been constructed from designs and plans prepared by Mr. John P. Briggs, Effingham House, Arundel Street, Strand, and built by Mr. John Jarvis, Tunbridge Wells. There are dwelling-houses, shops, warehouses, &c., facing on to four roads connecting Monson Road with Newton Road. The main entrance is just opposite Dudley Road. Over the pathway in front of the principal entrance is an iron and glass verandah. Above this is a balcony with some handsome colonnading, and above this rises to a height of



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60 feet from the ground an effective and finely proportioned cupola, the dome of which will be surmounted by the electric light at night-time. The façade is in the Georgian style of architecture, and the interior decorations are of the style of Louis XV.

THE new over-cliff drive, which has been constructed by the Bournemouth Corporation on the West Cliff, at a cost of 10,000*l*, was formally declared open by the Mayor of the borough on the 16th inst. Mr. J. E. Cooper Dean, the ground landlord, presented to the town the cliff front, with two acres of land in addition for pleasure grounds. The drive affords views of the Isle of Wight, Purbeck Hills, Corfe Castle, Old Harry Rocks, &c., and winds its way along Alum Chine amid stretches of gorse and bracken. After the ceremony a luncheon was given, and attended by the Mayor and Corporation and many leading inhabitants. It was stated that it was anticipated, as the result of a recent interview with Sir George Meyrick, the East Cliff frontage will be handed over to the town, and in all probability a drive constructed connecting the East and West Cliffs. It was also intimated that the drive just opened will be named King Edward's Drive.

THE following is a list of students to whom National Scholarships (Art) and Free Studentships (Art) have been awarded:—*National Scholarships*.—Harry C. Smith, Dundee; Henry A. Treganowan, Camborne; Annie M. Shepherd, Aberdeen; James Stroope, Belfast; George Bain, Edinburgh; William A. Wildman, Manchester Municipal School of Art. *Free Studentships*.—Norman R. Hall, Leeds; Oswald Schwemmer, Manchester Municipal School of Art; William M'Bride, Dublin; Frank P. Brown, Stoke-on-Trent; Lightowler, Manchester School of Art; Sidney Boyes, Southampton; George J. Mitchell, Dundee; Joseph R. Shea, Burnley; Herbert A. Budd, Hanley; James R. G. Exley, Skipton; Annie W. Morton, Edinburgh; William M. Whitehead, Burnley; John Gibson, Bury; Norman M. Morrow, Belfast; Annie R. Hetherington, Carlisle.

WE regret to announce the death of Mr. W. B. Wilkinson, of Newcastle-on-Tyne, on the 13th inst. in his eighty-fourth year. He was the founder of the well-known firm of W. B. Wilkinson & Co., Ltd., of Newcastle-on-Tyne and London, and was the originator of the now universally known concrete pavings. The first floor ever laid in this form was a greenhouse floor in Newcastle-on-Tyne by this firm, and afterwards the business developed to an enormous extent, their paving being

laid all over the kingdom and even as far away as Lisbon. Mr. Wilkinson took out a patent in 1854 for fireproof construction, and in many respects this has never been improved upon. He used wire rope and small bars embedded below the neutral axis of the concrete. In 1856 he patented a hollow tubular fireproof and soundproof partition, and in the eighties an ornamental concrete paving which he called "Specular Granitic." The deceased gentleman was a J.P. and was chairman of the Newcastle and Gateshead Gas Company, director of the Newcastle and Gateshead Water Company and the North Shields Gas Company, and was connected with many of the largest businesses of the North of England, while his connection with philanthropic institutions of the district was equally extensive.

WE have received particulars of the "Gasteam" radiator, which, as its name suggests, is one that with gas for fuel radiates steam heat. These radiators, which are well-finished and artistic in appearance, have several improvements embodied in them that deserve attention, one of the more important being the automatic regulation of the amount of gas consumed by means of a valve which closes when the radiator has become properly heated, leaving only sufficient gas alight to keep it to that temperature. These radiators are guaranteed by the makers to be odourless, provided that sufficient water is maintained in the reservoir, and to insure this they are fitted with a gauge glass, by means of which the amount can readily be ascertained. Among the advantages claimed is the small consumption of gas, about 1½ feet per section per hour; also that they take up very little space, can be heated at any time by applying a light to the burner, and as easily dispensed with by turning off the gas; they are self-contained, and can be attached to the nearest gas-pipe at a trifling cost. The "Gasteam" radiator is suitable for heating rooms, halls, churches, schools, theatres, &c., and to those desiring fuller particulars Messrs. Hendry & Pattison, Ltd., 11 Hills Place, Oxford Street, W., will be glad to furnish them.

THE facings required for the new Wellington town hall, New Zealand, are being imported from Sydney, though subject to a duty of 25 per cent. The cause is the scarcity of stonemasons in Wellington.

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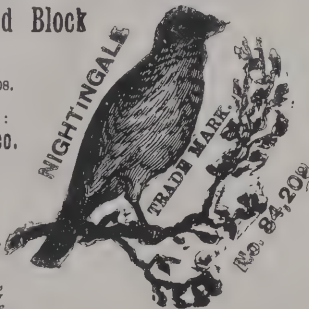
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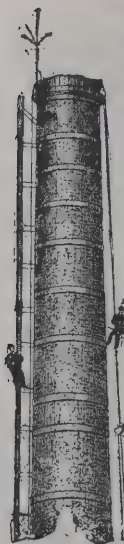
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**BUILDING AND BUILDERS.**

THE foundation-stone in connection with the new Wesleyan Sunday schools at Westgate Hill, Cleckheaton, which are to be erected at a cost of 6,000 $\frac{1}{2}$ ., was laid on Saturday.

ON the 18th inst. Mr. Alderman J. F. Wilkinson laid the memorial-stone of an extension to the Monton Wesleyan school church in Grange Drive, Manchester.

THE foundation-stone has been laid of a new Sunday school which is to be erected in connection with the Independen, Methodist church, Barton Road, Stretford, Manchester.

HER Royal Highness Princess Christian visited Hampstead on Tuesday to lay the foundation-stone of the new hospital to be erected at a cost which is estimated at 30,000 $\frac{1}{2}$  at the rear of the North-Western Hospital at Hampstead Green.

THE foundation-stone of the Queen Victoria Memorial Church, Eccles New Road, Weaste, was laid on the 18th inst. The church is being erected on a site valued at 1,800 $\frac{1}{2}$ ., which has been given. The building, which will accommodate 400 persons, is to cost 3,500 $\frac{1}{2}$ .. The work is being carried out from the designs of Messrs. Royle & Bennett, of Manchester.

WORK has been commenced on the new Marlborough Theatre, which Mr. F. W. Purcell (proprietor of the successful Alexandra Theatre, Stoke Newington, and of several important provincial theatres) is erecting in a very commanding position in the Holloway Road, nearly opposite the Nag's Head. Mr. Frank Matcham is the architect, a fact which promises much for the beauty and comfort of the new theatre, which will, we understand, be under Mr. Purcell's personal management.

THE members of the Merthyr Tydfil District Council have been engaged for several years in developing a scheme for housing the working classes. Five hundred cottages are to be built, and of these 100 are now in course of erection in the populous district of Penydarren. In view of the early completion of a number of these tenements (thirty-six are expected to be ready at the end of the year) the Council have decided to fix the rentals at 22s. 6 $\frac{1}{2}$ d. per month.

AT Ettington, near Stratford-on-Avon, the foundation-stone was laid on the 16th inst. of a new parish church, the old one being sadly out of repair and otherwise unsatisfactory. The work which Messrs. Collins & Godfrey (the contractors) have now in hand will cost about 3,000 $\frac{1}{2}$ ., and the fittings and furniture have yet to be provided. The new church has been

designed by Mr. C. Ford Whitcombe, and is a cruciform structure in the Perpendicular style. The work will be proceeded with in sections as funds permit.

AT the monthly meeting of the Pwllheli Town Council the principal business was the reception of the report of the harbour committee. Mr. Douglass, the engineer of the harbour scheme, attended the committee for consultation purposes. Acting on the advice of Mr. Douglass, the committee had requested some of the contractors who had tendered for the work under the original scheme to tender for a modified scheme. A few sent in amended tenders, and the committee recommended the adoption of the plans and the tenders sent in by Mr. E. R. Lester as the basis of negotiation for the modified scheme. Alderman Anthony said the cost would be a few pounds under 50,000 $\frac{1}{2}$ .. Mr. R. Ivor Parry moved that consideration of the matter be deferred. Mr. Winslow, in seconding, said the amended scheme was a new scheme, and that it should be brought before the ratepayers in the same way as the original scheme had been brought. Four voted for the adjournment and eight for the adoption of the committee's recommendation. The clerk was requested to write informing the Cambrian Railway Company that the Council had at last adopted the amended plans of the new scheme.

AT a recent meeting of the Leith Dock Commission, Mr. John Wilson presiding, Mr. R. Cross stated that, unless some more rapid progress was made in the deepening of the entrance to the new dock, the larger ships for which it was intended could not be admitted before September next. The General Works Construction Company had denied responsibility for one part of the work, which the Commissioners were getting done by another contractor on the understanding that the cost would be charged to them. But he thought they should hire or buy a more powerful dredger than was employed, and take the work in hand themselves, or make a fresh arrangement with some contractor who would get it done. The Chairman said difficulties had arisen which could not have been foreseen two years ago, but some drastic step was necessary, and the matter was remitted for report. The works committee intimated that they could not advise the Commission to proceed with the construction of a graving dock in connection with the new dock meantime, in view of the financial reasons put forward by the finance committee. The report was adopted.

THE Southport Corporation and the Pier Company directors have now arrived at an understanding with reference to the

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improvements at the pier entrance. A year or two ago the pier directors came under an obligation to the town to set back the pier approach a distance of 67 feet 6 inches, but under the new bargain the entrance will be 112 feet 6 inches from the present line. The scheme of the Corporation includes the building of a retaining wall between the first buttress of the marine bridge and the approach to the lower parade on the south side of the pier entrance. The intervening space will be filled with sand. The Pier Company, on the other hand, receive a considerable amount of land in frontage, and for this they will pay 650/. A short time ago the Corporation came to an agreement with the Victoria Hotel directors for the purchase of vaults at a cost of 5,000/. By these two transactions the Corporation will be enabled to carry out one of the most important improvements effected in Southport within recent years. The Victoria vaults will soon be a thing of the past, and a magnificent road of wooden setts will stretch up to the pier. The total cost of the whole scheme cannot be far short of 10,000/.

THE Farnham Urban Council are proposing to expend the sum of 4,000/. for the purpose of providing dwellings under Part 3 of the Housing of the Working Classes Act, 1890, and with this sum two sites have been provisionally secured for the erection of eight and twelve houses, which will accommodate in all 100 persons. The Local Government Board inquiry into the proposed loan brought to light some unpleasantly suggestive facts. It was stated that during the last twenty years only seventeen cottages had been built for workmen, and some of these were simply converted hopkilns. In one case a man and his wife and six children lodged in a house occupied by a man and his wife, the four adults and six children having only two bedrooms between them. The family were turned out, and after the father had lost three days in trying to find a cottage he put his family in a henhouse. In yet another case there was a cottage occupied by a child of three years, suffering from consumption, who died within a week. The other members of the family were the father and mother, three sons (aged seventeen, ten and eight respectively), two other girls (aged twelve and six respectively), and a seven months' old infant. Many families have been driven from Farnham by their inability to get cottages.

AT a meeting of the sub-committee of the district committee of Upper Renfrewshire—Mr. Henry Erskine Gordon, of Aikenhead, presiding—a plan and section of a modified scheme for rebuilding Auldhouse Joint Bridge and improving the lines

and levels of the approaches thereto, prepared by the district road surveyor and the burgh surveyor, was submitted, along with a report and estimate of the cost. The report stated:—"It is proposed to widen the Thornliebank Road to 60 feet from Auldhouse Gate to Auldhouse Bridge, and to widen Harriet Street within the burgh of Pollokshaws to 60 feet from the Auldhouse Bridge to the north-east boundary of Well Meadow Laundry; also, to rebuild Auldhouse Bridge and improve the gradients of the road between Auldhouse Road and Greenbank Street by raising the level about 3 feet at the bridge and by cutting a portion off Harriet Street." The total cost of the work was estimated at 3,359/. 15s., of which 1,800/. 10s. would be payable by the Upper district committee and 1,559/. 5s. by the Town Council of Pollokshaws. The sub-committee resolved to recommend that the district committee agree to the work being carried out, subject to sufficient contributions being received from the Glasgow Corporation Water and Tramways Departments towards the cost. It should be added that the Glasgow Water Department are to lay a new main over the bridge, and it is anticipated that tram lines will also be laid down.

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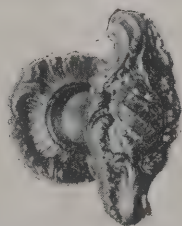
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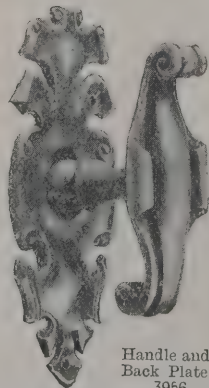
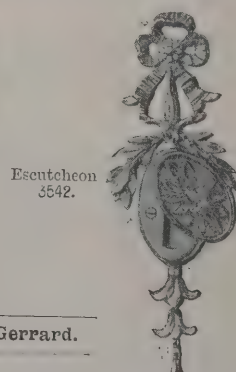
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arranged for. When the tie rods spacing the girders are in, the decking can be fixed at any time; very few bolts or rivets are necessary to secure the deck to the girders, and connections between the plates are made with cold rivets. For factories, warehouses, strong-rooms and all buildings where strength and economy have to be considered this flooring is especially well adapted.

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### AUCTIONEERS' INSTITUTE.

THE opening meeting of the session of the Auctioneers' Institute was held on Wednesday evening at the Medical Examination Hall, Victoria Embankment, when the president, Mr. John Hepper, delivered his inaugural address.

Devoting himself mainly to matters connected with daily business and current events, the President said that the refusal of their application for a Royal Charter would have the effect of causing the Council to strive in every way to broaden the foundations and strengthen the influence of the Institute, so that it should be a power to be reckoned with, and should hold a position second to none in its usefulness. This must be loyally aided by the committees of the various branches.

The country was alive with the cry of education. What for? Primarily because it was essential to the maintenance of our commercial supremacy. Education was to be found in the school and the college, but there was a continuation school of vast importance—the school of experience. In this the wise man was a daily student, and in proportion to his cultivation therein and thereby would be his fulness of knowledge, the measure of his usefulness to the world, the gauge of his powers. He who sets a low standard of attainment for himself was often deficient in moral purpose and self-respect, and he was contented with small things. If he was no more than his license made him—an auctioneer without qualifications—he was unworthy of the dignity of a Royal Charter, and therefore ought not to possess its privileges. In conclusion Mr. Hepper paid a high tribute to the memory of the late Mr. J. F. Field, an ardent supporter and past president of the Institute.

The medals gained at the last examinations were presented during the evening.

### THE AUCTIONEERS' BENEVOLENT FUND.

THE annual meeting of the Incorporated Auctioneers' Benevolent Fund was held at the Mart, Tokenhouse Yard, Mr. E. W. Rushworth presiding. The report and statement of accounts showed that there was a slight falling off in the subscriptions and donations during the year. The total receipts under that head amounted to 436*l.* 16*s.* The annuities now numbered fourteen, and further grants amounting to 50*l.* had been made at a committee meeting that afternoon. Mr. Daniel Watney was re-elected treasurer.

The meeting next proceeded to the consideration of a motion by Mr. F. Eiloart, one of the members of the committee of management, to the effect that a sub-committee be appointed to consider the advisability of amalgamating the capital of the Fund with that of the Benevolent Fund of the Auctioneers' Institute. Mr. Eiloart pointed out that the total amount invested in the name of the Fund was 10,669*l.* 1*s.* 4*d.*, and he argued that as the two funds were organised and subscribed to for benefiting the same class of people, they could be more economically managed and efficiently distributed under one management. He protested against the hoarding up of the subscriptions for investments, and pointed out that during the last three years the average income from subscriptions and interest was 825*l.* 11*s.* 3*d.* per annum, and they had spent in grants and annuities 436*l.* 6*s.* 8*d.*

Mr. Warman seconded the motion.

Mr. Galsworthy and Mr. Watney opposed the proposal, and the Chairman took the same view, remarking that the idea of the committee in having a large amount invested was to keep the annuities secure, so that whatever happened to the subscriptions the annuitants should always receive their money.

The motion was negatived by a large majority.

### MUNICIPAL BUILDING SPECULATIONS.

THE *Times*, in a leading article, says:—The fifteenth of our articles on Municipal Socialism, which we publish to-day, deals with the intervention of municipalities in the provision of houses for the working classes. This branch of the subject happily illustrates by the proceedings of different municipalities the general principle which ought to govern the delimitation of the spheres of private and municipal enterprise. That principle

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is that municipalities ought not to undertake directly to supply a public want until it is clearly demonstrated that the ordinary social, commercial and industrial machinery is incapable of doing the work efficiently under proper and vigilant municipal supervision. Putting aside all theoretical or political objections to municipal trading, this principle rests upon a sound business basis. That basis is that experience proves abundantly what knowledge of human nature would lead us to expect—that commercial undertakings are never managed so efficiently and economically by a fluctuating body of municipal representatives as by men directly and personally interested in their success. It is no doubt possible to point to apparent exceptions to this as to every other rule. There are municipalities which contrive to get an exceptionally good class of citizens to attend to public affairs, and which carry on some specific undertaking, such as the supply of water, in a manner that leaves nothing to be desired. It may be doubted, however, whether even in these cases results at least equally good might not have been attained had the municipalities in question confined themselves to their proper work of supervising and controlling those who minister to great and general public wants in such a manner as to secure the greatest possible public benefit without frightening capital away altogether. As soon as we pass from a limited class of undertakings in which the whole community, without exception, are interested, the objections to municipal supply become indefinitely stronger. When we find a municipality prepared to take into its own hands anything and everything which in private hands is showing a profit, we get at once into a region of economic disorganisation from which spring evils tenfold greater than arise even from wholly unregulated private enterprise. The municipalities which abandon their proper work of control and supervision, and of obtaining when necessary legislation to make their control effective, have themselves to be controlled by a central department. But whatever may be the case elsewhere, it is generally true in this country that a Government department is a slow, wasteful, obstructive and inefficient machine for conducting business. A municipality is inefficient enough in itself, but a municipality doubled with central control—and no one is rash enough to venture to dispense with it—is probably the very worst business combination that perverse ingenuity has yet developed.

Our correspondent shows what, indeed, is common knowledge among all who have given any attention to the matter, that municipal house building is a failure. When all sorts of

dodges have been resorted to in order to lighten the apparent cost of providing workmen's dwellings, the fact stares us in the face that the dwellings are beyond the means of the class for which they were ostensibly built, or that municipal regulations are too irksome for that class to put up with. There is a showy but not very practical Act of Parliament which saddles municipalities with initial costs and delays enough of themselves to destroy the business prospects of a building speculation. Putting these aside, we find that the municipal employer does not get the same value for money as the private one. Overseers and workmen alike think the public purse inexhaustible and a proper subject for plunder. The municipal council consist of gentlemen who depend upon the votes of their own servants and can most easily secure them by laxity in control. The demoralisation spreads, the private builder cannot get more work than the public one exacts, and the result is that the rents of workmen's houses steadily rise in spite of disguised eleemosynary aid. Not only so, but in many cases there is an absolute dearth of houses, whereupon a cry is raised not for a return to common sense but for more municipal building with a more frank and complete reliance upon the rates. Accordingly, the rates are rising with alarming rapidity in most places, and the rise is contemplated with absolute satisfaction by our Socialist theorists. They think they are making the well-to-do pay for the poor and idle. They are really inflicting a loss upon the community, and that loss will fall in the long run most heavily upon the poor, in spite of all the legislation in the world. The poor are far more deeply interested than the rich in the wise conservation of national resources.

The same Act which in Part I. provides cumbrous and costly, though showy means of dealing with insanitary areas, does by some happy accident provide in Part II. a simple and inexpensive means of shutting up insanitary houses, and incidentally getting better ones provided on business principles by private builders. But municipalities generally elect to adopt the showy, dilatory and costly method, ending in failure to supply the poor with houses, instead of the simple and unostentatious method which supplies the houses without bleeding the ratepayer or demoralising the workmen. Some municipalities, as our correspondent shows, use their summary powers to close insanitary dwellings, leaving their owners to put them in proper condition at their own expense, which is the right thing to do. If these owners fail to supply proper accommodation other men are ready,



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in the absence of municipal competition, as a business matter to build houses meeting legal requirements, and in neither case does the ratepayer suffer, while in both cases the poor get proper dwellings at rents within their means. Why is this not done everywhere? Partly because it is not showy enough; partly because there are no pickings to be made out of it, while big municipal schemes can be made to yield very good private returns; and partly because the owners of insanitary properties are often on the Council and prefer to be bought out at a fancy price rather than to have to put their houses in order at their own cost. There would be much less municipal socialism if there were not so much keen individualism in municipal councils.

### LIGHTING, HEATING AND SMOKE ABATEMENT EXHIBITION AT THE CRYSTAL PALACE.

THE Lighting, Heating and Smoke Abatement Exhibition at the Crystal Palace is to be opened on Saturday, December 13, for five weeks. Preparations for a really representative display were commenced many months ago, and from the progress already made there is no doubt that the forthcoming exhibition will cover a much wider sphere than its precursor of last year, and at the same time include all the latest and most recent improvements in gas lighting and heating.

The most important new feature of the Exhibition will be the coal smoke abatement section, which is being organised under the patronage of the Coal Smoke Abatement Society. No branch of modern hygiene deserves greater consideration than that dealing with the question of getting rid of the obnoxious products of combustion of coal, and it is with the object of drawing increased attention to this very urgent subject, and interesting those more directly concerned, that the Society are offering a prize of 50*l.* for the best domestic open grate which in the opinion of a jury, to be appointed by Sir William B. Richmond, president of the Society, is best capable of consuming its own smoke. The section will be situated in the centre transept, while a further space in the building will be set aside where exhibitors can show their various appliances in operation.

The gas engineering section, in which all the most up-to-date contrivances for the more efficient and economic uses of gas will be incorporated, will possess many unique inventions

of interest alike to the expert and layman. Street lighting, the illumination of large buildings, incandescent burners, recuperative gas-burners, gas-lamp fittings, vehicular lighting and all kinds of intensified gas lighting will all have space allotted for their respective illustration.

The latest advances in gas cooking and warming apparatus will be placed in position, while meters, from the most approved wet and dry systems to the now popular slot machines, will be on view. Cooking demonstrations and lectures will be given daily. Every description of gas plant and labour-saving appliance for the manufacture of gas will also be able to be inspected. A further section will, of course, be devoted to gas-engines, and also another for colliery exhibits of various coals.

The electrical section will also form a most important and prominent feature. It will be fully representative of this great and rapidly increasing industry, and embrace everything included in the gas section, viz. lighting, heating, power, and even cooking by electricity. Judging from the great exhibition of 1892, this section alone will no doubt put to the test the vast resources of the Crystal Palace and give them ample scope for their well-known organising abilities.

The promoters of the exhibition have secured the patronage of the Acetylene Association, which should insure this branch being particularly attractive. The period of the exhibition will embrace the chief holiday season of the year, and it might also be mentioned that it is the forerunner of an international display of a similar character to be held about the same time next year.

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The United States, by its civil engineer in charge of the work or other authorised representative, shall at all times have full control and direction of all work under the contract, and all questions, disputes, or differences as to any part or detail thereof shall be decided by such civil engineer or representative, subject only to appeal to the Chief of the Bureau of Yards and Docks.

The contractor shall employ only competent, careful, orderly persons upon the work, and if at any time it shall appear to the civil engineer in charge that any person employed upon the work is incompetent, careless, reckless or disorderly, or disobeys or evades orders or instructions, or shirks his duty, such person shall be immediately discharged from and not again employed upon the work.

If at any time the progress of the work shall, in the opinion of the civil engineer in charge, appear to have been such as to indicate that the work is not likely to be completed within the time allowed, he shall report such opinion to the Chief of the Bureau of Yards and Docks, who may in his discretion declare the contract null and void, without prejudice to the right of the United States to recover for defaults or violations.

This specification and the plans accompanying it shall be considered as supplementary one to the other, so that materials and workmanship shown, called for or implied by the one and not by the other shall be supplied and worked into place the same as though specifically called for by both. All detail plans that may be furnished subsequently in further amplification, as well as all instructions given by the civil engineer in charge that may be necessary to more fully indicate the intention of the specification and the above-mentioned plans, shall be followed and considered as though forming a part of the original contract. For all portions of the work the contractor shall submit the necessary detail plans to the civil engineer in charge for approval, unless otherwise directed by him, before proceeding with the work. These details shall conform to the letter and spirit of the specification, to any supplementary data and instructions, and to the general and detail plans already furnished the contractor. Plans shall be submitted to the civil engineer in charge in the form of tracings on cloth of Bureau of Yards and Docks standard sizes. These will be returned to the contractor either with blue prints of same stamped "approved" or to be revised as noted on the tracings. In the latter case the necessary corrections shall be made, and the revised

drawings submitted before proceeding with the work. Approval of plans will be of a general nature and will not relieve the contractor from errors or omissions that may exist therein.

The contractor shall check all plans furnished him immediately upon their receipt and promptly notify the civil engineer in charge of any discrepancies discovered therein. Figures marked on plans shall in general be followed in preference to scale measurements; but the contractor shall compare all plans and verify the figures before laying out the work, and will be held responsible for any errors therein that thereby might have been avoided. Large-scale plans shall in general govern small-scale plans. In all cases where dimensions are governed by conditions already established the contractor must depend entirely upon measurements taken by himself, scaled or figured dimensions to the contrary notwithstanding, but no deviation from the specified dimensions will be allowed unless authorised by the civil engineer in charge. The contractor will be held responsible for the lines and levels of his work, and he must combine all materials properly.

After the dry dock and all appurtenances relating thereto required by the contract are complete in all particulars, a board of officers appointed by the Secretary of the Navy for the purpose will examine and test the structures and all work included under the contract. All expense of such examination and test will be borne by the Government. After the board has reported that all work called for by the contract has been completed in every particular, according to the true intent and meaning of the specification, plans and contract, and after the report has been approved by the Chief of the Bureau of Yards and Docks, the contractor will be paid the remainder of the contract price. For a further period of six months after the approval of the report of the above board by the Chief of the Bureau of Yards and Docks the Government may test the dry dock and appurtenances under any working conditions which it sees fit, and if at the end of that time no bad workmanship, weakness, or other defect due to the fault of the contractor shall appear, the work will be accepted and the contractor and his bondsmen will be released from further responsibility; if such defects do appear, they shall be made good by the contractor without additional compensation.

Sheet 1 contains a record of borings made at various places on the Government property. This record is given for the information of bidders. However, the Government does not guarantee it to be correct in all particulars, or that the conditions will be found uniform, and it will not be responsible for



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### CANADIAN LUMBER.

A CORRESPONDENT of the *Leeds and Yorkshire Mercury* writing from Vancouver says:—

The two trees of greatest economic importance in British Columbia are the Douglas fir, known in commerce as Oregon pine or red fir, and the great cedar, commercially called the red and sometimes the yellow cedar. The so-called Oregon pine is best known in England, but during the past few years the chief market has been British South Africa. The term Oregon pine is a characteristic commercial misnomer. In the State of Oregon it has been practically worked out, and the tree is not a pine at all, but a true fir. Botanically it is known as *Abies Douglassii*, and for its supplies of this invaluable timber the world must henceforth mainly depend upon the dense forests of British Columbia.

The coast ranges, the Cascade Mountains, the islands and the inlets on the mainland are its favourite habitat; and so vast is the acreage ascertained by the surveys of the Dominion Forestry Commission to be covered by this superb conifer, that even if the present annual output were trebled, and an allowance of 50 per cent. be made for destruction by fire—an allowance which experience shows it imperative to make—it would take sixty years to work out the ascertained acreage. At present, however, only about one-third of the limits of the province is taken up, and the remaining two-thirds offer a splendid field for the investment of British capital. It is estimated that the limits already taken up will be worked out by the companies now in operation in twenty years.

A common object adjoining a British Columbian farmhouse is a clump of Douglas firs standing in the open. In such a situation the whole character of the tree is transformed; the enormous limbs, draped in deep green, glossy fronds, droop to the ground, spreading a broader shade than the noblest of the forest-famed beeches of Denmark. But in the forest the tree grows without branches except at the top, yielding timber of immense size and strength, destitute of knots, and particularly suitable for bridge-building, house-building, wharves, piles, masts and furniture. No other timber is put to more varied uses. It is the material from which a great part of the bedroom furniture of America is made, and the chief timber used in the building of her wooden bridges and wooden sailing

ships. So dense are the forests that as much as 508,000 feet have been cut off one acre in Vancouver Island.

Next in economic importance to the Douglas fir is the great cedar—*Thuja gigantea*. The celebrated "big trees" in Stanley Park, Vancouver Island, are specimens of this species. Though of less lofty stature, the dimensions of the trunk frequently exceed those of the Douglas fir. It is a more ornamental wood, and is mostly used for interior furnishings, cabinet-making, doors and shingles. The manufacture of shingles, with which almost all the houses in Canada and the Western States are roofed, I shall describe later on.

I can merely enumerate the other forest trees of British Columbia. The yellow cedar, or cypress—*Thuja excelsa*—commands a great price as a furniture wood, owing to its close grain and high susceptibility to polish; it also forms a grand forest tree, 6 feet in diameter frequently; but its range is more restricted than that of the Douglas fir and the red cedar. Of commoner distribution and wider range, forming forests over great areas of the mainland still untouched, are the hemlock, the balsam fir, the bull pine, the tamarack or western larch and the broad-leaved maple.

My object in reciting these particulars is to show the field which exists for the investment of British capital in Canadian timber. The wood-pulp industry has come into great prominence in recent years and has conferred immense value upon the second-growth forests of spruce which abound in every province of the Dominion. Quite a large number of United States companies have engaged in this manufacture, which, owing to the existence of inexhaustible water-power everywhere, is highly lucrative, and some of the largest pulp-mills in Canada are owned by Americans. A similar remark applies to lumber factories and saw-mills, numbers of which have been erected by United States capital along the Canadian shores of Lake Huron and Lake Superior. The Dominion regulations for obtaining timber leases are as generous as the land settlement laws.

Some particulars about the Victoria Lumber and Manufacturing Company will illustrate the profitable nature of the business. This company for one initial payment of 5 dols. per acre acquired the license for twenty-one years to hew the timber of 122,000 acres. At the minimum computation, every acre will yield 30,000 lineal feet board measure—1 inch thick, 12 inches square—but it is nothing uncommon to get 200,000 feet upon an acre and sometimes the yield per acre is as high as 500,000 feet. The average selling price is 5 dols.

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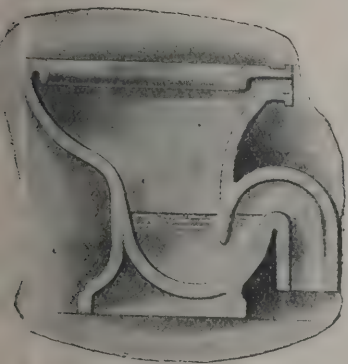
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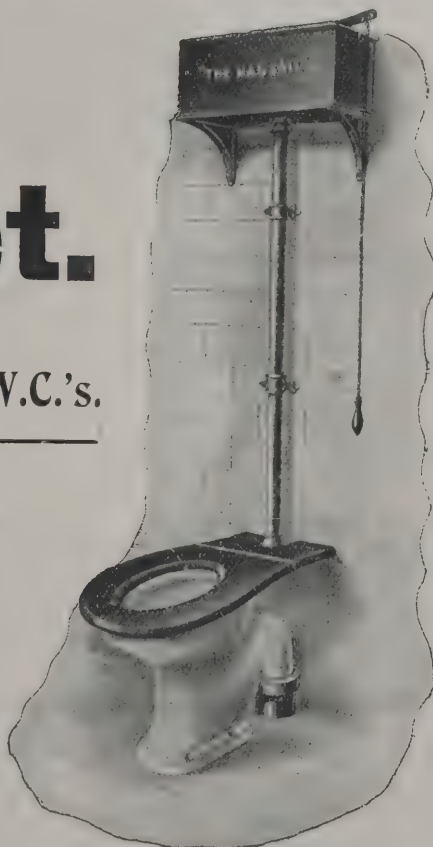
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per thousand feet, and this company's production last year was 56,000,000 feet—44,000,000 for export and 12,000,000 for home consumption. All this was Douglas fir—the so-called Oregon pine—this company reserving the cedar and other woods on its property for the present. The capital of the company is 1,000,000 dols., and I understand that an offer was recently made to buy out the company for 2,500,000 dols.

The saw-mills and loading wharves at Chemainus form one of the sights of Canada. Most of the machinery in a Canadian saw-mill is similar to that in England, but out here they have appliances for handling the rough logs which fill everyone with amazement. As a general rule the logs are brought to the mills by water, and a single jamb or raft is sometimes a mile in extent, and contains several millions of feet of lumber. Everything is done mechanically. The logs are raised from the water up an inclined plane, upon which moves an endless pulley, studded with steel teeth, and delivered upon a movable platform running parallel to a stupendous circular saw.

The monster log, dripping with brine, is slowly lifted up the gangway. As it projects through the doorway at the extremity of the bay, it seems to darken the spacious building, its huge bulk excluding so much light. No sooner is the log delivered upon the movable table than two immense grappling forks, like Titan hands of steel, sling it into position facing the circular saw, the lumberman pulls a crank, and the platform upon which he stands rushes madly forward, carrying the inert mass, automatically focussed to the nicety of a line against the teeth of the rotating steel. A deafening screech, the torture of a few seconds, and the "back" is severed from the log. The platform darts rapidly to and fro, the sawyers, strong of hand and of eagle eye, flit along with it. Never before in my life had I witnessed such strength and expertness. It is like men toiling incessantly upon some colossal moving shuttle, and in a few minutes' time the rough-barked log has been hewn into a score of planks, which the eye can hardly follow as they travel along to be still further split and dressed into deals.

At the work above described expert sawyers can earn 17. and upwards a day, but only smart and agile men are fitted for the task. Chinamen do most of the less responsible work—I am here speaking of Chemainus—and hundreds of them seem to be employed at this mill. The bays and timber yards are of great extent, and all the machinery is of the most modern description. At the end of the yard ships are loading the dressed timber—full-rigged 3,000-tonners, barques and four-masted schooners—and the day we visited the yard ships were

loading for Liverpool, Panama, Melbourne and the Cape. On the previous week vessels had cleared for Calcutta, Shanghai, Tien-tsin, the Cape, Liverpool, Sydney and Geraldton, in Western Australia.

Although the cedars and Douglas firs are the trees of greatest economic importance to British Columbia at present, and the coast forests where they grow are the only ones likely to be worked for some years to come, they by no means exhaust the forest wealth of this province. The big trees form a mere littoral fringe—a fringe, however, equal in area to Italy. In the central region between the Cascades in the West and the Rocky Mountains in the East, over an area 770 miles long and 300 miles broad, is a solid forest of spruce—black spruce and white spruce—the greatest preserve for the pulp industry which the world contains.

Moreover, this spruce forest passes beyond the bounds of British Columbia. It extends down the Peace River into the little-explored plains of Athabasca, its range being only bounded by the barren lands of the Arctic and the central wheat-growing steppe, which, as I have explained in previous letters, is destitute of forest vegetation. In the prairie trees are confined to the creeks and river bottoms, and are of inappreciable economic significance. The chief species are Manitoban poplar, or cotton wood, Western birch and tamarack.

Hitherto the staple article of the timber trade in Eastern Canada has been the white or Weymouth pine, the most useful of all pines for common lumber. In innumerable mills it is manufactured into structural woodwork for houses, flooring, doors, window-frames, &c. New Ontario will for years to come be the chief producer of this serviceable cheap timber for all the North American continent. Though the conifers—firs, pines, cedars and cypresses—constitute the preponderating factor in Canada's forest wealth, they are not the whole. The maple, the elm, the birch, the oak and the walnut diversify her sylvan scenery, often form extensive hardwood forests, and afford the materials for that important furniture-making industry to whose rapid strides in recent years I have already referred. In some of the Eastern mills one may see the whole process of manufacture from the raw log to the polished cabinet, from the floating jamb to the decorative furnishings of a drawing-room.

The harvest of the forest ranks third in value in the products of Canada, taking precedence of agriculture. Last year's exports, without including wood-pulp and many manufactured articles, were valued at 6,030,000. sterling, or 30,009,857 dols.

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# The Architect.

## THE WEEK.

It would be interesting to know by what principle the Irish Board of Works schedules buildings under the Ancient Monuments Protection Acts. The island abounds in ruins which are neglected, and it has been generally considered there must be extraordinary interest about any remains which acquire official control. According to the annual report of the Board, the church in Waterford, where some of Lord ROBERTS'S ancestors are buried, henceforth enjoys protection. It is reputed to date from 1240, and the structure consists of the nave, tower, transept and choir of the Franciscan church. The tower and transept are roofed, and the choir was in 1695 assigned to Huguenot settlers as a burial-place. There is no extraordinary architectural interest about the remains, and they were not thought to be worthy of becoming State property until Lord ROBERTS attained the climax of success. There is no objection to find a burial-ground in ruins gaining peculiar privileges; but it is tacitly understood that except in unusual circumstances an ancient monument is valued through its architectural or sculptural character rather than from the fact that some of the progenitors of a great man have found repose near the ruins. In Ireland there is a tendency to undervalue the work of old builders and artists and to exalt the associations attached to a spot, although in the majority of cases they rest on insufficient evidence. Waterford was mainly occupied by strangers; it was the Danish capital, and when the English came in the twelfth century it was among the few places which became loyal to the invaders. It has, however, few relics of its early possessors, and the Franciscan monastery is not a striking example of Mediæval art.

It has often been regretted that England is not possessed of natural gas, which in America has been utilised to an enormous extent as a cheap motive power. The gas required in Great Britain has to be distilled from coal. It is known, however, that England is not entirely destitute of gas, and if adequate search were made many sources would be struck. A company has been formed entitled the Natural Gas Fields of England, Ltd. A communication has been received from the company by the Heathfield Parish Council offering to light the eight standard lamps which are used for illuminating the village for eight months for a sum of 22*l.* 8*s.* The price is, therefore, about 55*s.* per lamp, and it includes supplying the light, which would have the latest form of incandescent burner, and keeping the lamp in condition. As the parish has not adopted the Lighting Acts the Council could not come to any official determination, but it was resolved to ask twenty-seven of the inhabitants to become guarantors, and to erect an additional lamp. The Sussex experiment will be watched with much interest by parish councils throughout the country.

The importance of CHARLEMAGNE as an historical personage is increased rather than diminished as the years pass. In his own lifetime he was regarded as a demigod, and his loyalty to the Church was accepted as a necessity. According to the legends he was not buried in a horizontal position within the church which he had erected in Aachen, or Aix-la-Chapelle. He was left seated with the imperial crown on his head, his sword by his side, and an ivory Book of the Gospels open on his lap. It may have been imagined that the king with the snowy beard would, when he exigencies demanded, reappear as the saviour of Europe. Although his actions as described by the poets and romance writers were superhuman, the account given by his son-in-law EGINHARD made him a familiar personage, who was a giant in size and strength, who bathed in the warm springs of Aachen, wore a garment of otter skins, gladly listened to songs about mythic heroes, who directed everything, the councils of State, the army, the training of priests and bishops, and the work performed by his

gardeners. At length he was canonised. When OTHO III., inspired by the contemporary enthusiasm, wished to verify whether the remains of the Emperor had not succumbed to time, he was able to see him still seated upright on a throne, his face bandaged and wearing a crown. Then came FREDERICK BARBAROSSA, who opened the grave in 1165 and ceremoniously carried what remained of the imperial bones and laid them in a new shrine, over which he hung a jewelled crown as a token of reverence. Archaeologists and historians are not all agreed about the incidents we have mentioned. CHARLEMAGNE'S body is now supposed to have been deposited in 814 in an old pagan sarcophagus, which was placed beneath the earth like an ordinary coffin. Above the grave a block of stone was raised of the same length as the sarcophagus, and which bore an inscription. Over it was a canopy, on which the figure of the Emperor was represented on a golden ground. The Normans when they entered Aachen destroyed the canopy and levelled the ground beneath it. OTHO III. sought for and found the grave and had it opened, but then closed. Subsequently, as we have said, BARBAROSSA in 1165 removed the bones to the position in which they are still thought to remain. Such are the latest conclusions of Professor BUCHKREMER on a subject which has excited much controversy. They dispel the legends, but it is likely they express the truth.

"OLD ST. PAUL'S" is still a name to conjure with, and HARRISON AINSWORTH was aware of the fact when he selected that title for one of his romances. The church was a connecting link between Roman London and times that were comparatively modern. But the greater part of the building which succumbed to the Great Fire was not more ancient than the eleventh century. The history of the cathedral has been made the subject of several books, but for the majority of readers we doubt if any of them is to be preferred to the "Portfolio Monograph" by Canon BENHAM, D.D., F.S.A., published by SEELEY & Co., LTD. The author has been in a position to utilise not only the labours of many investigators and the archives of the cathedral, which are better arranged than formerly, but the new processes of photographic presentation have enabled the pages to be illustrated by reproductions of the fine engravings by HOLLAR, as well as drawings in various collections, and, in addition, with portraits and copies of illuminated manuscripts relating to ecclesiastical functions. So many plates in a cheap book are unprecedented in our time. HOLLAR was a Bohemian, who was a protégé of the Earl of ARUNDEL. He held the position of drawing-master to the PRINCE OF WALES, the son of CHARLES I., and he served as a soldier in the Royalist ranks. Having escaped to Antwerp, he remained there for some years, and then returned to England, where he was employed on the illustrations for DUGDALE'S "History of St. Paul's," his pay being at the modest rate of 4*d.* an hour. His style was laborious, and he was more anxious to express details than to suggest pictorial effects. Not only views of the building are given by him, but representations of some of the most important monuments. In none of the views is the great steeple introduced, and the building therefore is deprived of a feature which at one period was a landmark in London and Westminster. There are one or two anonymous drawings of great interest. One shows the west front after the fire, in another we see JAMES I. and his court listening to a sermon at Paul's Cross, and the frontispiece is a compilation suggesting what the building was like when viewed from the river. There is some reference to the drawings by the late B. E. FERREY, who was a most conscientious draughtsman, but it is pointed out that in his representation of the spire he has not shown the corner pinnacles of the tower, which appear not only on the seal of the Chapter but in WYNGAERDE'S drawing. Canon BENHAM'S book is not confined to an architectural description. In St. Paul's many historical events were transacted which are narrated. The book therefore forms a worthy companion to the author's "Mediæval London," and both should have a place in the smallest library of the inhabitants of London and especially of the City.





PAINTERS' ARCHITECTURE: BREEMBERG.

### PORPHYRY.

THERE was no science like geology among the ancients, and in consequence the references to the materials employed in sculpture are often very vague. When, to take one instance, we hear of a vase, sarcophagus, or column being made of porphyry, we cannot imagine what was its colour or appearance. Many varieties of stones of an igneous class were believed to be porphyry. There are, for example, references to green, black, rose and mottled porphyries. Stones that would now be considered as syenite, serpentine, obsidian or basalt were formerly regarded under that generic name. From its endurance, and the colours some varieties presented, it was esteemed as a most valuable decorative material.

The Egyptians were long familiar with it, but the Romans do not appear to have become acquainted with it until the third or fourth century of our era. According to PLINY, the first blocks were sent from Egypt by VITRASIUS POLLIO, and it is supposed the material did not meet with admiration. WINCKELMANN was of opinion that the porphyry was not in blocks, but in the form of statues of the era of the PTOLEMIES. VISCONTI, on the other hand, maintains that the Romans were already cognisant of porphyry, and there was no novelty for them in the material. It is, therefore, not unlikely that the presents of VITRASIUS were works which he had ordered, and which from their archaicism were not judged to be in good style. From the quantity of porphyry discovered in the ruins of Palmyra it is evident that the Romans were able to appreciate so tenacious a stone. Another proof of admiration for it is to be observed in the attempt to make the draperies of white marble statues assume the semblance of porphyry by means of painting. Under ANTONINUS PIUS it was extremely valued. From its colour it was supposed to bear some relation with purple, and was consequently assigned to statues of deities, emperors and exalted personages. Sometimes it was used for draperies by sculptors, and sometimes for heads.

It is to be regretted that the introduction of the material should have been deferred until a time when Roman art, and especially sculpture, no longer displayed Greek influence. CONSTANTINE THE GREAT employed porphyry for sarcophagi. In the Vatican there are two remarkable examples. One sarcophagus served as a receptacle for the remains of his daughter, St. CONSTANTIA, the other for those of his mother, St. HELENA. The reliefs which embellish the exterior of the former are sufficient to indicate the condition of art at the period. The composition resembles some of those painted in the catacombs. We see winged amorini gathering grapes from branches or trampling on them in the wine-press. The figures are, of course, symbolic. There are also peacocks, which had ceased to be recognised as the attributes of JUNO alone. Porphyry is extremely difficult to carve, and allowance should be

made accordingly for the imperfections. But when all is taken into account the conclusion cannot be resisted that the early Christian sculptors were deficient in artistic skill, and with the most pliable materials would not have been much more successful.

The sarcophagus of St. HELENA is more ambitious in its ornamentation. It is suggestive of a battle-field, and may have some reference to the victory of her son over MAXENTIUS, which, as an important event in Church history, was one of the last works selected as a subject by RAPHAEL. After the battle CONSTANTINE introduced the labarum with a figure of the Cross as the army ensign, and the inscription "In hoc signo vinces." St. HELENA was credited with the finding of the Cross, and she could be easily supposed to have had some influence on the mysterious events of the battle. As the Rotunda of the Vatican was intended to be a shrine for the colossal porphyry vase, so the adjoining hall of the Greek Cross was formed to house the pair of immense sarcophagi. It is related that the restoration of the sarcophagus of St. HELENA occupied eight sculptors during ten years.

LEON BAPTISTA ALBERTI, the architect, was attracted by the difficulty of working porphyry, and endeavoured by research to discover the secret of the ancient operations. It is so hard as to resist strokes of the chisel, and it is only, as it were, in grains the surface can be abraded. According to VASARI's account, it was essential for the porphyry worker to have heavy hammers pointed with a diamond, and, what seems more extraordinary, the hammers must be soaked in the blood of goats. COSMO DE MEDICIS also investigated the subject, and he was reputed to have been able to harden the tools required by means of vegetable juices. He communicated his discovery to one of the Florentine sculptors, BAPTISTA DEL TADDA, who followed it with success. Modern scepticism will not accept the statements, and probably there was no other way to conquer the consistency of porphyry than patient labour. It is said, however, that MICHEL ANGELO, who was strong armed, was amazed at TADDA's facility in operating on hard stones. One instance of his skill was familiar to the Florentines. It was the porphyry statue of *Justice* erected by Cosmo to commemorate his victory over his countrymen at Montemurlo. The material was overcome to excess, for it was necessary to add a mantle of bronze in order to remove the appearance of slenderness which the figure presented.

Owing to the slowness of the operations, it was requisite to employ a large number of workmen on every example which had to be produced in porphyry. The vases of the Vatican and of the Naples Museum, and the statues and busts in the material, must have cost a sum of money which it is now difficult to estimate. It has been maintained by some archaeologists that the ancient sculptors may have been acquainted with processes, or rather appliances, by which manual labour was diminished. If, however, they had been conversant with a machine such as



the modern "rock-drill," it would be easy to imagine that a more delicate variety could be used for sculpture. But, so far as is known, the Romans trusted entirely to human hands, and it is not unlikely they possessed trained slaves who were capable to undertake the mechanical exercises of stone-working. From experiments carried out of recent years it has been concluded that porphyry is ten or twelve times harder than marble. In VASARI'S time the saws in use were without teeth, and were formed of copper. It was likely that sand or emery was an auxiliary, and the saw merely kept the grains in motion.

GAUTIER in one of his poems recommends the sculptor to work only on the hardest and most enduring materials, and no doubt it would be well to confer as much immortality as possible on a work of art. It is remarkable, however, that such materials as porphyry, or basalt, never seem to have been in favour with great sculptors. It is true we have Egyptian figures over which time seems to be deprived of power. The style of execution cannot be considered as more than conventional, and the characters of the figures are in keeping with the material. No ordinary individual can feel any sympathy with the kings or deities who seem to be removed beyond the region of human existence. The delight with which the portrait in wood of the old overseer was received suggests the failure of the great works in basalt, granite, or porphyry to appeal to the minds of living men. We have the authority of HERODOTUS for the existence in his day of wooden statues, and, judging from the effect produced by the examples which have survived, we may with some reason conclude that the statues which the old Egyptians loved were not those made, so to speak, for eternity. There is a limit in calculating time, and men do not care to see works which appear as if not destined to pass away.

It is doubtful whether any of the statues of porphyry which exist can be considered as the production of Greek sculptors, unless we apply that name to men who were compelled to labour in Rome under unfavourable conditions. If the legends are of any value, Greek sculpture was for a long period embodied in figures of wood. We cannot suppose that the works in bronze were other than castings, or it may be a collection of beaten plates rivetted together. Marble, ivory, gold seemed to be enduring enough for the sculptors of Greece. No doubt the hardest stones were selected for glyptic works, and Greek gems are often as remarkable as the large statues. But we should remember that gems were constantly handled; they were utilised for personal adornment, and the minuteness of the details if worn away would cause the whole to lose its character. It is idle to assume the Greek sculptors were ignorant of the materials made use of by the Egyptians, but they seem never to have been eager to toil on stones like porphyry. It was felt no doubt that an over-rigid substance was not well adapted for the representation of action; for although the bronze of Syracuse could vie in endurance with any of the porphyries of Egypt, it was realised that a bronze statue was no more than a copy of a model in clay. The passage of PLINY which has been the subject of much comment is certainly suggestive of the fact that in his time the connection between bronze figures and the clay originals was not overlooked. He tells us how "LYSISTRATUS of Sicily, brother of LYSIPPUS, first of all expressed the image of a man in gypsum from the whole person, and improved it with wax or colour spread over the form. He first began to make likenesses, whereas before him the study was to make persons as beautiful as possible. He also invented expressing effigies from statues, and this practice so grew that no statues or signs were made without white clay. From which it would seem that this science or process was older than that of casting in bronze. The most famous modellers were DAMOPHILUS and GORGASUS, who were also painters, and who decorated the Temple of Ceres at Rome with both branches of their art." In this passage it is evident that PLINY, and probably the amateurs of his time, formed a mental vision of a statue in its original condition, which was as near living reality as possible. In fact, the old belief was that the statue was in the block of marble, and was made visible by the removal of the matter concealing it. With a material so tenacious as porphyry such a belief was hardly possible.

#### MODERN SURVEYING.\*

THE failure of the plans of the proposed Brighton railway to sustain scrutiny before the examiner on standing orders was enough to disquiet a great many people connected with works on a grand scale. The errors no doubt arose through the use of Ordnance Survey sheets of old date. But the system must have been at fault by which such plans were deposited. It is always expected that plans and sections of railways are to correspond, and when we see on plans objects which do not exist, as well as the omission of important objects, it is evident that the two were not compared, and it may be assumed the sections are also erroneous. The plans of the Brighton line were evidence of incapacity to produce extensive surveys on a small scale. The Land Registry report has also demonstrated that plans of houses and other buildings on a comparatively large scale are produced no less carelessly. The conclusion to be drawn is that modern surveying is the work of untrained men who are ignorant of the methods of measurement by which errors are obviated.

There can be little doubt that many of the errors arise from the too general use which is made of the maps of the Ordnance Survey. Great care has no doubt been taken with that work, but indiscriminate copying of the sheets is a risky process. Details are being constantly changed, and the maps in consequence become obsolete. The triangulation no doubt was laboriously laid down and measured. But it is quite possible that in many cases it has not the accuracy which is desirable. This will be seen in cases where areas are given and which will not always agree with computation from the maps. In the case of plans for Parliamentary purposes, the errors derived from a 6-inch Ordnance map may not be serious. But to follow the 25-inch maps for working plans means liability for inaccuracies, and may cause the outlay on works to be larger or smaller than would be the case with an exact survey. This would mean a loss either to the railway company or to the contractor. Surveying must, we suppose, submit to the same economical law as many varieties of business, or, in other words, must be produced at the cheapest rate. By the employment of the Ordnance Survey time and trouble are spared. But the reliance on maps which were not intended to become the basis of contracts is a departure from old principles which produced satisfactory results.

The same spirit is also seen in the efforts to substitute photography for measurement. Remarkable views may be obtained in that way, and for dealing with immense tracts of lands in new countries photography can be turned to account. But the legal aspects of the arrangement do not appear to have received any consideration. From the earliest time it has been recognised that a surveyor's plans are documents which can be supported by oath in a court of law. Indeed, among litigious people the surveyor is a frequent attendant at trials. But can anyone believe that an English judge or jury, with no more than a photograph of a disputed property before them, would give as much reliance to it as would be placed on a plan produced by a surveyor who testified to the accuracy of every line in it? One would be an approximation to the truth, the other would be as true a representation as human intelligence can produce. When they are bound to plans which are simply modifications of the Ordnance Surveys, experienced contractors are too shrewd to be indifferent as to the degree of confidence, with which these can be accepted, and in such cases the allowances for contingencies are likely to always be greater than in cases where plans which have been prepared in the legitimate way are employed.

It is necessary, however, for the young surveyor to understand that the days when a chain, a few off-set staves and a pole or two were sufficient to produce extensive plans are over. That method was not always successful. It often failed in dealing with winding rivers and in surveys of the extent of an ordinary parish. The English tithe maps and the Irish Down Survey are evidence of failures of chain-

\* *Surveying as Practised by Civil Engineers and Surveyors*. Including the setting-out of works for construction and surveys abroad, with examples taken from actual practice. Intended as a handbook for field and office use. Also as a text-book for students. By John Whitelaw, jun., A.M.Inst.C.E. London: Crosby Lockwood & Son.



work which have caused a great amount of inconvenience to the public. Prior to the employment of the theodolite for taking angles, the area which the ordinary surveyor was able to map was likely to be incorrect unless the work was carefully tested. There are plans which have withstood all attempts to prove them to be inaccurate, and they deserve to be considered as examples of scientific geodesy conscientiously produced under many difficulties. The theodolite, it should be remembered, was costly, and was rarely employed by ordinary land surveyors, who preferred more simple instruments for determining angles.

The invention of the theodolite caused a revolution in surveying. It was a development of earlier instruments, such as the astrolabe and the quadrant, the latter being in use until the end of the eighteenth century. A horizontal circle was also devised in Denmark, and used for large surveys. To RAMSDEN, the English optician, we owe the theodolite. It was first employed in the operations for the connection of the observatories of Greenwich and Paris. Three were made by him for the trigonometrical survey between 1787 and 1799. TROUGHTON & SIMMS and other opticians introduced improvements from time to time, and the ordinary theodolite now in use appears to have little connection with that which was figured and described in the Philosophical Transactions towards the close of the eighteenth century. Without the theodolite railways could not have been so accurately or quickly laid out. It may be said with truth that the theodolite is more generally associated with such operations than with ordinary surveying. In some kinds of surveying, as in the case of large towns and cities, the theodolite is not easily dispensed with.

The character of Mr. WHITELAW's book can be judged from the introduction of the theodolite in the second chapter. The science of surveying, as it was known to the old-world practitioners, is explained in the first chapter. Other instruments employed in surveying operations, and especially in levelling, are also described. Examples of working plans and sections are given. The latter, we think, could be improved if, as the gradient or formation level is commonly drawn in red ink, the levels relating to it should also be in red, and it is more convenient if they are placed opposite the figures indicating the level of the surface on the other side of each ordinate. The depths of cuttings and embankments will be more appropriately disposed if they are written on or near the parts to which they relate. During the execution of works the parts between the gradient and the surface line become the most important, and it is unnecessary labour, besides offering a chance of error, to have to seek the depths and heights at foot near the datum line. The section given of the Tolley tunnel is interesting, for the different varieties of material to be encountered are defined. Information of that kind is not always forthcoming, and we doubt if contractors care to possess it. There is less left to chance, which an English contractor generally believes will be favourable to him, for a much higher rate can be charged when the faults, springs and changes of strata are unknown. Indeed, it seems to be difficult, if not impossible, to determine the geological character of a tunnel which is 6,229 yards in length without costly preliminary works. The setting out of this tunnel was performed with so much accuracy that "when the headings met the difference between the centre lines of the two headings was found to be  $4\frac{1}{2}$  inches and the difference between the levels was  $2\frac{1}{2}$  inches." The description of the means adopted in this case reveals the perfection which is now attainable. With such examples the truth of the saying, "Science is measurement," becomes manifest. The publishers have already issued useful books on surveying, and the addition of a new volume would probably not have been undertaken if it had not been found that a demand exists for a certain class of information which it was necessary to supply.

One of the new appliances is the tacheometer, used for telescopic ascertaining of distance and height. It is found to be of great utility in preliminary surveys for roads and railways. We are told that "on the Continent the tacheometer is supplanting every other method of making preliminary surveys for public works, especially among Italian, French, German and Spanish engineers." The employment

of the tacheometer may be only partial in this country where the Ordnance Survey maps are available for projects in an embryo state; but for engineers who have to investigate countries which are not so favoured the instrument becomes a necessity.

Land surveying in its fullest extent forms the subject of about two-thirds of the volume. A portion is also assigned to marine surveying. There are in addition chapters on such work as is required in jungles, forests and the trigonometrical surveys which are usually undertaken after much deliberation by public departments. There is also considerable incidental information such as the following concerning the surveying regulations in the Australian colonies:—

In the Australian colonies almost every branch of the civil engineer's profession is practised directly under the control of the State, and more especially those branches in which surveying plays an important part. Surveys under the control of the Departments of Lands and Survey are performed by salaried officials, or by those who are "authorised" on either Crown lands or sold lands which will be brought under the operation of the Transfer of Lands Statute. Plans of surveys made by "unauthorised" persons are not officially recognised. All "authorised" surveyors must comply with the regulations issued as departmental instructions or bearing the force of an "Order in Council." Each colony is divided into survey districts, each of which is under the control of a salaried inspecting officer. These, again, are subdivided into divisions, and each is assigned to an "authorised" surveyor to whom orders for departmental work are sent. The "authorised" surveyors are not salaried, but are remunerated by fees fixed by regulation, and they are removable at the pleasure of the Surveyor-General. When a vacancy occurs selection is made from those holding a certificate of competency obtained by examination. The inspecting officer of each district makes periodical inspections of "authorised" surveyors' work in the field, their instruments, field books, &c., and certifies to all accounts. Inspecting surveyors are under immediate control of the Surveyor-General. The higher classes of surveying, including minor triangulation, are performed exclusively by staff officers; the ordinary sectional or block surveying and laying out of towns and roads is performed by "authorised" surveyors. The system of examination and supervision is so complete that a very high standard of efficiency has been attained.

It will be seen that Mr. WHITELAW does not confine his attention to English work alone. The stay-at-home surveyor can only have a limited field before him. The book is adapted to the new conditions of English life—that is to say, it will meet the conditions of the regions which are now accepted as being in reality as well as in name parts of the Empire. At home or abroad Mr. WHITELAW's "Surveying" will be found a profitable guide.

#### THE GLASGOW ART GALLERIES.

THE exhibition of pictures, sculpture, &c., in the new fine-art galleries belonging to the Corporation was formally opened on Saturday. It will be remembered that the galleries formed a great attraction during the international exhibition held at Kelvingrove last year. The exhibition of pictures, British and foreign, brought together at that time, says the *Glasgow Herald*, was the most brilliant ever seen in Scotland. That memorable collection was soon returned to the owners after the exhibition doors were closed. Since then the permanent art treasures of the Corporation have been removed from Sauchiehall Street to the new building. The contents of the Kelvingrove museum have been similarly transferred. The valuable Corporation collections will also be recognised as having benefited greatly by removal from the unsuitable rooms in Sauchiehall Street to the new galleries. The pictures especially are now seen to great advantage in respect of fuller light and air and space. In the grand central hall we have the elaborate pendent brass lamps, with their myriads of lights hanging from the arched roof, and reflecting the rays of light from lofty windows. There is, however, the added decoration of the fine organ. East and west from the main hall extend the courts, which are also very bright in appearance. The central hall is devoted as before to sculpture. A number of pieces are in marble and some in bronze; the majority, however, are careful casts taken from famous works. One of the finest pieces is Flaxman's famous statue of Pitt. Other works were acquired at the exhibition of 1888 and at the exhibition last year. Included in these are two outstanding pieces by Rodin, the distinguished French artist, his "John the Baptist" and "The Burgher of Calais."



The eastern division on the ground floor is devoted to natural history science, the southern saloons being occupied with zoological and mineralogical collections. The corner pavilion is given over to the remains of recently extinct animals. The central court contains the mammalian collection, together with the large assortment which the Corporation now possess of osteological specimens. In the central saloon in the same division are shown birds, reptiles and lower forms of the animal kingdom. In the corner pavilion beyond is a collection illustrating British zoology as well as local specimens. The south transverse saloon holds the ethnological collection.

Crossing the grand hall to the north-west court of the corresponding division the shipbuilding and engineering industries and architectural subjects are reached. A large number of very fine models of recently-constructed vessels are here shown, besides an important historical series of vessels illustrating the development of shipbuilding, especially on the Clyde. The general technological collections which were formerly in Kelvingrove Museum occupy the saloon on the south. The corner pavilion adjoining is given over to metallurgical industries. In the transverse saloons are engineering models, which give a general idea of the industry. The north-west corner pavilion has been allotted to the historical memorials and remains of Glasgow. There is a large series of pictures of the city at various periods which the Corporation now possess, and which were painted by Crimean Simpson, Thomas Fairbairn and William Small, besides a very large number of deeply interesting relics of Glasgow. General antiquities and personal relics occupy the adjacent saloon. In this section there is a large gathering of stone and bronze implements from Scotland, America, Egypt and Somaliland. General antiquities range from remains from ancient Egypt, Greece and Rome down to obsolete implements of modern times. There is also a fine collection of pottery and other ancient manufactures, remains of the Incas of Peru and the old Mexicans and primitive American tribes.

The galleries in the upper floor of the buildings are entirely set apart for the art collection. The gallery on the north-west side contains ancient pictures, while in the corresponding saloon on the south side are exhibited the works of modern and living artists. Beginning with the old pictures, in the first saloon are hung the famous Flemish works, which are the property of the Corporation. The corner pavilion and transverse gallery are given over to the Corporation's pictures by old Dutch masters. In the north-west pavilion and adjoining saloon are the works of early Italian painters. Most of these pictures are pretty well known to habitués of the old Corporation galleries. The balconies are entirely given over to collections of art objects, and some of these may be singled out. There is a case of magnificent old English silverware, lent by Mr. John A. Holmes, of Paisley, who has included in the collection the famous silver Tudor cup which he acquired last summer at the Dunn-Gardner sale for 4,000*l.*, and many other magnificent examples dating from the fifteenth to the eighteenth centuries. In the first of the south art galleries are pictures by Scottish artists. Another gallery is filled with pictures principally of the English school, and here is also to be found the exceedingly valuable collection gifted by the Messrs. Reid, of Hyde Park, which is treated as a group apart, as indeed, in one of the other galleries and a corner pavilion, is a series recently acquired under the bequest of Mr. Thomas B. Smellie.

A distinctive feature of the exhibition is a loan collection of eighteenth-century British and French pictures, which has been brought together in the large transverse gallery and adjoining pavilions. The British section is one of great beauty and importance. Indeed, in quality, if not numerically, it recalls the pictorial triumphs of last exhibition. Portraiture is in the ascendant, and when it is mentioned that there are examples of Reynolds, Gainsborough, Raeburn and Hoppner it will be seen that there is much to interest and instruct. Amongst other noblemen and gentlemen to whom we are indebted for these treasures are the Duke of Westminster, Lord Tweedmouth, Sir Charles Tennant, Bart. of the Glen, Sir Samuel Montagu, Bart.; Mr. R. H. Brechin, Mr. William Beattie, Mr. Arthur Kay and Mr. R. B. Don. Raeburn is strongly in evidence. Perhaps the finest examples of his art are the portraits of Alexander Campbell and Mrs. Campbell. The lady wears a white dress, over which is a red robe. Soft brown hair curls to the forehead. The carnations of the winsome face are exceedingly fine. This is Raeburn at his best. Other fine portraits by the master are of Thomson of Duddingston (who may be regarded as the founder of the Scottish school of landscape), of Mrs. Oswald and of himself. Three examples of Gainsborough are interesting as well as important. One is in portraiture, the Ladies Erne and Dillon; another is a landscape, "Watering Horses," which for brilliance of colour and free handling is unsurpassed in the exhibition. The third canvas bearing his name is a seascape, full of light and life and atmosphere. How broadly and simply it is treated—

how charming and finished its art. Two exquisite presentations of child-life are by Reynolds—a quaint little girl standing demurely with clasped hands and enveloped in golden light, and "The Dead Bird," a child lamenting the loss of her favourite. Other works bearing the same name are portraits of Lewis, the actor, and Mrs. Billington, who, if we remember aright, also trod the stage. A magnificent example of Hoppner may be studied in "The Sisters," two young ladies in al-fresco dalliance. The arrangement is extremely felicitous, the landscape more than a mere suggestion. Romney is represented, amongst other things, by a charming Lady Derby and a half-length of Lady Holte, the latter the property of the Corporation of Birmingham. Mr. Robert Ramsey sends on loan "The Cellarman," attributed to Jean Honoré Fragonard. It is a small work of great delicacy and charm, but it is not at all in the style of the Frenchman. We should rather suppose it to belong to the Dutch school. Sir John Stirling-Maxwell, Bart., sends a number of Blake's drawings, quaint and weird conceptions, including a great oblong, "The Canterbury Pilgrims," "Adam," "Nebuchadnezzar" and "The Last Judgment." The technique is in some passages admirable, while the drawing is frequently defective. Blake was a profound dreamer. The French eighteenth-century pictures have been lent by Mr. Reginald Vaile, of London. One need not hesitate to express the opinion that the most accomplished canvas in this collection is that of Jean Marc Nattier, who paints the Countess of Newbourg and her daughter. The Countess is a handsome woman in figure and complexion. Her features are repeated in those of her daughter, whose sweet oval face is lighted up by dark, luminous eyes. The colour is refined, the arrangement charming. "The Unhappy Family," by Greuze, is not pleasant, either in colour or in subject. Over it is "The Beggar Boy," also by Greuze, a much better picture of its kind. It is delicate in tone and makes pathetic appeal. "The Two Sisters" is also by Greuze. J. S. Chardin's head of a peasant girl, wearing a straw hat, is one of the gems of the exhibition. "The Dance," by Nicholas Lancret, is in the style of Watteau, and reflects the pastoral gaiety of the age in which he lived. Two Watteaus in his familiar manner are shown, and there are several canvases by his pupil, J. B. J. Pater, and a Fragonard, "The Wagered Kiss."

It will be remembered that a collection of pictures by Jean Honoré Fragonard entered into the last Guildhall show in London. They were the property of the American millionaire, Mr. J. Pierpont Morgan, and were assigned a special room. Glasgow has been similarly favoured by the man of many dollars, and here the pictures have been brought together in one of the pavilions, where, it may be added, they are better spaced and lighted than in London. Fragonard, who died at the beginning of last century, was a decorative painter, as Mr. Morgan's collection sufficiently attests. He painted the open-air elegancies of the French life of his time, making much of graceful costume and deportment, and sometimes indulging in the representation of indelicacies which nowadays would give offence. We hasten to say, however, that no charge of this kind applies to Mr. Morgan's collection. It is illustrative in a series of panels of the romance of love and youth. "Love and the Maiden," "Love's Folly," "The Love Letter," "Love the Assassin"—subjects such as these indicate the manner in which the artist develops his theme. He does so with much delicacy and skill—paints flowers and trees and luxuriant foliage with appreciation, and introduces symbolism that is always helpful in interpretation.

We have to congratulate all who have been concerned in the arrangement of the galleries and the hanging of the pictures. Superintendent Paton, Curator Rennie, Mr. Downes and Mr. Wm. Young may well be satisfied with the issue of their long continued labour.

#### THE LATE JOHN FAED, R.S.A.

THE death is announced at Gatehouse, in the Stewartry of Kirkcudbright, at the advanced age of eighty-two, of Mr. John Faed, R.S.A., who as an artist was well known throughout Scotland. Three or four months ago, says the *Scotsman*, he became seriously ill, and it was seen some days ago that the end of a long life was approaching. No later, however, than the 18th of this month he wrote a holograph letter, gifting to the Royal Scottish Academy one of his later pictures in oil, called "The Poet's Dream." The picture arrived, but the Council of the Academy had not an opportunity of thanking the donor for his generous gift, though that was done informally by Mr. George Hay, the secretary. The subject of the picture is a poet stretched on the high bank of a lake, across which, in the sky, the visions of his fancy take shape before him. It is painted in clear tones, and finished with much care. John Faed, who was born in Galloway, was the eldest of a large family, several of the members of which ros-



to distinction in the world of art. His father, who was a miller and engineer, was a cousin of General Sir George Faed, K.C.B., who fought at Waterloo. Faed showed early his bent towards art. He taught himself amid many early discouragements; and, having seen a few miniature portraits on ivory, he determined to be a miniature painter. At the early age of twelve—he had left school a year before—the boy artist is said to have perambulated the towns and villages of Galloway practising his art, and getting patrons among the aristocracy of the district. In his twentieth year the young artist went to Edinburgh, ostensibly to attend the art classes at the Mound, but he did not remain long in them, and established himself as a miniature-painter in the city with the greatest success. He was acknowledged to be one of the leading artists in Scotland in this dainty branch of art until he gave it up over forty years ago. One of the incidents of the early forties was exceedingly creditable to him. Having gained a good footing himself and made some money, he sent for his brother Tom, then a draper's apprentice in Castle-Douglas, to come to Edinburgh to study art. He did so to some purpose, and became a painter of homely genre, whose works are still immensely admired. His youngest brother James followed later, and turned out one of Scotland's leading line engravers. Of the Faed family only Mr. James Faed and Mrs. Walthew (Susan Faed), herself an artist also, now survive. So early as 1841 Mr. John Faed began to exhibit in the Royal Scottish Academy, and for many years thereafter his name was seldom out of the catalogue. He commenced to paint and to exhibit pictures in oil as well as miniatures, and in 1847 he was elected an Associate of the Royal Scottish Academy—full membership coming in 1851. He found his subjects in Burns, in Scott, in Shakespeare, in history and in the homely life of the country—among other noteworthy works by him being "Boyhood" (1850), "The Cruel Sisters" (1851), "The Cottar's Saturday Night" (1854), "Reason and Faith" and "The Philosopher" (1855), "The Household Gods in Danger" (1856), "Job and his Friends" (1858), "Boaz and Ruth" (1860). Among pictures of this period may also be noted "The Raid of Ruthven," "Rosalind and Orlando," "Olivia and Viola" and "Shakespeare and his Friends at the Mermaid Tavern"—a companion picture to his brother Tom's work—"Scott and his Friends at Abbotsford." These pictures were praised by the critics and found a ready sale. In 1862 Mr. Faed removed to London, where he resided for the next eighteen years. While there he regularly exhibited in the Royal Academy such works as "Catherine Seyton," "Old Age," "The Stirrup Cup," "John Anderson my Jo"—a particularly beautiful little example of his art—"Old Mare Maggie," "After the Victory," "The Morning before Flodden," "Blenheim," "In Memoriam," "Goldsmith in his Study" and "The Old Basket-maker." One of his pictures, "The Wappinschaw," which was shown in the Royal Scottish Academy, was purchased for 1,000*l.* or 1,200*l.* by Mr. James Baird, of Cambusdoon. His diploma work, which hangs in the National Gallery, was "Annie's Tryst." The influence of Mr. Faed's art as a miniaturist was seen in his oil-pictures. He was a careful and precise painter, could compose his pictures so that they told their story well, was careful of his drawing and painted in pure, if a trifle hard, colour. In 1880 Mr. Faed retired to his native Gatehouse, where he spent, in quiet retirement, and surrounded by sympathetic neighbours, the evening of his days. Since settling in his native place, he painted several beautiful views of the valley of the Fleet, one of which he presented for the adornment of the Gatehouse town hall, and to the year 1883 belongs "The Poet's Dream," which, as stated, he presented to the Royal Scottish Academy. Mr. Faed was in his youthful days in Edinburgh an officer in the Artists' Company of the City Volunteer Artillery, of which the late Sir Noel Paton was captain. In private life he was warm-hearted and generous, and greatly respected by all who knew him. His wife, an accomplished woman, who had been a great helpmeet to him throughout life, died about four years ago.

### BOSHAM CHURCH.

AN appeal has been made by the Rev. K. H. MacDermott on behalf of one of the most ancient and interesting churches in England—the parish church of Bosham, in the county of Sussex. Built on the site of a Roman basilica, portions of which still exist and are visible in the bases of the present chancel piers, the church has an architectural and historic interest without a parallel. The nave, tower and part of the chancel were built by the Saxons, who used for their work many of the old materials that had previously formed part of the Roman building. In a corner of the nave Canute, who had a dwelling-place at Bosham, buried his young daughter, and the stone coffin containing her remains was discovered in 1865 in the exact spot indicated by tradition. After Canute, Harold lived there, and in the famous Bayeux tapestry, worked by Matilda, wife of William the Conqueror he is depicted

entering Bosham Church before his fateful journey to Normandy. In the twelfth century Bishop Warlewast of Exeter founded a college at Bosham, and for the accommodation of its members he enlarged the church by adding the aisles and lengthening the chancel. In the thirteenth century Herbert de Bosham, the great friend of Thomas à Becket, was buried in the church of his native place. It was at Bosham that Wilfrid, in A.D. 681, first preached Christianity to the South Saxons, although we learn from Bede's "Ecclesiastical History" that Wilfrid found already established a small monastery, in which an Irish monk named Dicul, with five or six brothers, served Our Lord in poverty and humility. This historic edifice is now in sad need of renovation, and as the parish itself is neither large nor wealthy, friends outside are invited to help. The work to be done, which includes the reshingling of the spire, rehanging of the bells, repairs to roof, ceiling and walls, is absolutely necessary for the preservation of the ancient fabric, and the vicar believes that Englishmen all over the world will gladly help rather than allow so unique an English historic monument to fall into decay. The work will be carried out with the most careful regard to the preservation of the many ancient architectural features and under the superintendence of competent architects. It is estimated that the sum of 2,500*l.* will be required to complete the work, and donations are earnestly solicited, and will be gratefully acknowledged.

### SOUND-PROOF PARTITIONS.

THE subjoined report has been prepared by Professor C. L. Norton, on the use of "Sound-proof Partitions":—

The subject of partitions for fireproof buildings is one which has led to much investigation, especially by the New York City Building Department.

When it is desired to make a partition which shall be reasonably sound-proof, it is apparently necessary to diminish somewhat the absolute incombustibility of the partition, though to a less extent than was supposed.

The following account of tests made for Mr. Edward T. Barker, architect of the dormitories of the New England Conservatory of Music, will show the relative values of some of the typical partitions of sound-proof separations between rooms:—

There were built upon the concrete floor of the B. & A. warehouse, East Boston, five rooms 7 feet square, whose side walls were made of the several partitions. The rooms were built upon a floor of the same kind as that which is to be used in the buildings for the students of the Conservatory, for which the results of these tests were especially desired.

The rooms were built near one another on the fifth floor of the warehouse in a large loft or room about 50 feet by 70 feet long and 9 feet high. The ceiling of each room was the under surface of the concrete ceiling of the large room. Each room had a floor of two thicknesses of  $\frac{3}{4}$ -inch floor-boards with two thicknesses of Cabot's sheathing quilt between the floor-boards and the concrete slab of the main floor. On one side of each room was a door with a glass panel, the door-jambs being faced with soft felt, and the bottom of the door was fitted with a stop "weather-strip," operated when the door closed, making a tight joint at the bottom.

The side with the door will be referred to as the front in the following description:—

Room A.—This room was submitted by the National Fireproofing Company, and its four sides were made of terracotta blocks. The front and back walls were made of blocks 4 inches thick; the sides of 2-inch and 3-inch blocks. After the blocks were in position the room was given two coats of plaster inside and out.

Room B was submitted by the Keystone Block Company and its four walls were made of the blocks of the Keystone, material of the nature of plaster-of-Paris with a fibrous bond. The front wall was of blocks 4 inches thick, and the left side was of blocks 2 inches thick, the back of blocks 3 inches thick, and the right side of two 2-inch blocks with a 2-inch air-space between them. The entire room was given two coats of plaster inside and out, except the front, which had no plaster on the outside of the blocks.

Room C was submitted by the Sackett Wall Board Company, and was built of Sackett plaster board  $\frac{1}{2}$  inch thick, wired upon both sides of 3-inch steel channels. The channel truss or studs of the back and right sides were wrapped with felt about  $\frac{1}{2}$  inch in thickness before applying the plaster board. The Sackett plaster board is a composite board of alternate layers of paper and plaster, the whole being about  $\frac{1}{2}$  inch thick. This room, like the other, was plastered inside and out, but to a slightly less thickness.

Room D was submitted by J. Russell & Co. and was of a more complex construction. The left side was a solid partition of metallic lath and plaster. The  $\frac{1}{2}$ -inch steel ties were spaced 16 inches on centres, metal lath was applied to one side only of the ties and then plastered to a thickness of 2 inches. The



rear wall was built upon two rows of  $\frac{7}{8}$ -inch studs staggered. Between them were placed one thickness of waterproof paper about 1-32 inch thick, and metal lath was wired to both sides of the row of studs and given two coats of plaster. The right side was of the same construction, with a layer of  $\frac{1}{8}$ -inch felt between the two thicknesses of waterproof paper. The front wall was of metal lath on two rows of staggered studs, with Cabot's seaweed quilt between the rows of studs.

Room E was submitted by Mr. Samuel Cabot, and was wholly of metal lath and plaster double partitions, with the space between the lath filled with Cabot's sheathing quilt. The front and left sides contained three thicknesses of quilt, and the right side and rear two thicknesses. The quilt was placed between the studs and the metal lath, and where three thicknesses were used, one was between the row of studs as well.

The rooms had been vigorously dried for several days, none longer than a week, but the whole building was so damp and the time so short that no considerable part of the plaster and none of the interior portions of the partition were dry. The Sackett board room was the driest and Cabot's was the least dry.

The preliminary trials showed so great a range of efficiency of the several constructions that the microphonic apparatus, which was designed to make rapid comparisons of sound intensity possible, could not be used. Reliance had to be placed wholly on listening with and without a felt-mouthed stethoscope at the outside of the partition to sounds of various quality and intensity from within. The notes of the piano, violin, cornet and the human voice were carefully tried throughout wide ranges of pitch and intensity. The performers and the instruments were interchanged, every possible chance of unfairness due to the variations of intensity in the sounds used was eliminated. Of course no interchange of the positions of the room was possible. No electrically-driven tuning-fork could be used for producing sounds of constant loudness. The insulating property of some of the partitions was so good that even the blare of a cornet or the overpowering tones of an Italian tenor, drawn from the ranks of the labourers on the building, could be heard through the partition except by careful listening within a few inches of the wall.

After much consideration the writer has given the following ratings to the different partitions. The order of their standing upon the list indicates their efficiency as compared with those above and below them.

No.	Room.	Side.	Scale.	Composition.
1	E	Left	100	... Cabot's quilt, 3 thick + metal lath.
2	E	Right	95	... Cabot's quilt, 2 thick + metal lath.
3	E	Rear	95	... Cabot's quilt, 2 thick + metal lath.
4	C	Rear	85	... Sackett board, 2 felt on $\square$ s.
5	C	Left	85	... Sackett board, 2 felt on $\square$ .
6	C	Right	80	... Sackett board, 2 felt.
7	D	Rear	75	... Metal lath + paper.
8	D	Right	75	... Metal lath + paper + felt.
9	B	Right	60	... Two 2-inch Keystone block with 2-inch air space.
10	A	Rear	50	... 4-inch National terra-cotta blocks.
11	B	Rear	50	... 3-inch Keystone blocks.
12	A	Right	45	... 3-inch National terra-cotta blocks.
13	B	Left	40	... 2-inch Keystone blocks.
14	A	Left	40	... 2-inch National terra-cotta blocks.
15	D	Left	30	... 2-inch metal lath, solid plaster.

Nothing more is to be inferred from the numerical efficiencies than that the first partition is about three times as good as the last, and that the numerical interval between any two partitions on the list merely indicates the order of magnitude of the difference between the partitions.

The partitions making up the rooms submitted by Samuel Cabot and the Sackett Wall Board Company were the most efficient; but it is distinctly to be borne in mind that no other room had so easy a test as did these, in that each of the others had one thin and ineffective side which transmitted sound to the sides adjacent to it. The thin side of the Keystone room was noticeably resonant, and plainly rendered it impossible to make a fully satisfactory test of the air-space partition. The solid metal-lath plaster partition of the room submitted by J. Russell & Co. acted in the same way in that room.

I do not believe, however, that this defect in the structures has caused any changes in the position on the efficiency list of the Cabot and Sackett rooms.

The efficiency of the Cabot quilt as a material for rendering the partition sound-proof is so clearly demonstrated in these tests that I recommend it for use in the partitions in which these tests were made. The nature of the material in which the quilt is encased should be carefully considered. I do not think it within the province of this report to discuss the partition from other than acoustic considerations, and as an encasing medium the most effective material is Sackett board and adamant plaster.

I would therefore give as my opinion that the best acoustic results would be attained by using a partition of Sackett

board and plaster, with two thicknesses of Cabot's quilt between the plaster board.

I should recommend a wooden stud rather than steel channels if the fire-risk is not materially increased thereby.

As later tests showed, some sort of a suspended ceiling will be needed, as the concrete slab transmits the sound across the top of the partition readily. No trouble will be given by the sound passing through the concrete to the rooms above or below, but unless a layer of Cabot's quilt, with the under-lath and plaster, or of Sackett board and plaster, be put on the under side of the concrete ceiling the efficiency of the partitions will be diminished somewhat.

The front walls could not be tested because of the leaks around the door and through the door-frames, even where covered with a large shutter padded with Cabot's quilt. It is evident that a double glass door will be needed. The floor construction is acoustically good.

## ARCHITECTURAL ASSOCIATION OF IRELAND.

THE second general meeting of the session took place at the Grosvenor Hotel, Westland Row, Dublin, on the 21st inst. The president, Mr. F. G. Hicks, occupied the chair, and there were present a large number of members. Mr. Arnold Mitchell, of London, delivered a lecture on "Some Interests of Mediæval Architecture," which was most highly appreciated. Mr. Charles Ashworth proposed a hearty vote of thanks to the lecturer. He spoke in the highest terms of the lecture and of Mr. Mitchell's kindness in coming so far to give it. Count Plunkett seconded the motion, and made some remarks about the surface colour decoration of Gothic interiors. Mr. J. H. Pentland supported the resolution, which was put to the meeting by the President and passed with acclamation. The next meeting will be held on November 4, when Mr. C. J. McCarthy, the city architect, will read a paper on "Three Weeks in Normandy."

## LORD CHEYLESMORE'S BEQUESTS.

THE late Lord Cheylesmore's bequests for public uses are as follows:—"I give to the trustees of the National Gallery the following pictures, on condition that they shall be kept in the National Gallery, with a label affixed to each one stating that it was bequeathed by me, namely:—(1) 'The Execution of Lady Jane Grey,' by Paul Delaroche; (2) 'The Highland Flood,' by Sir Edwin Landseer; (3) 'Dying Grouse,' by Sir Edwin Landseer; (4) 'Italian Landscape,' by J. van Both; (5) 'Cromer Sands,' by William Collins; and I give to the trustees of the National Portrait Gallery my collection of mezzotint prints, on condition that they shall not part with the different states of the same print, but shall keep them in such a manner that they may be accessible to the lovers of the art of mezzotinting as being the portraits of persons in every state of life in this country; also the catalogue enumerating them and any of my books or engravings which they may care to have; also my collection of portrait prints of the English Royal Family." By a codicil to his will, Lord Cheylesmore transferred this bequest to the trustees of the British Museum.

## THE DUFFERIN MEMORIAL.

A SPECIAL meeting of the Dufferin memorial committee was held in Belfast on Tuesday. Sir Daniel Dixon presided. Mr. F. W. Pomeroy, the sculptor to whom has been entrusted the commission of executing the memorial statue, submitted two models of alternative design. The committee unanimously approved of one. The memorial, when completed, will be of imposing appearance, and will stand 30 feet high. The statue of Lord Dufferin, wearing the robes of the Order of St. Patrick, will be in bronze. There will also be figures representing Fame, Canada and India. The architectural setting of the figures will be in Portland stone, and is on Renaissance lines. It consists of a canopy supported by four Ionic columns, with modelled capitals, the whole standing on a massive base showing four panelled faces, on two of which are seated figures emblematic of Canada and India, and the remaining two bearing the inscription of Lord Dufferin's name and title. The whole is surrounded with carved friezes divided into panels, on which are inscribed names of the countries in which the late Marquis served. Above the canopy stands a dome, on which rises a figure of Fame, bearing a palm and raising the torch of light and learning. The entire work, which will cost 5,000*l.*, will be finished in two years, and the Corporation has granted the Donegall Square at the west side of the new city hall for the erection of the statue. Mr. Pomeroy has been fortunate in securing the collaboration of Mr. Bramwell Thomas, architect of the new city hall.



## NOTES AND COMMENTS.

It is expected that in December there will be an exhibition of the models of the adopted designs for the Queen Victoria Memorial by Mr. BROCK, R.A., and Mr. ASTON WEBB, A.R.A. As the area to be treated will be the space in front of Buckingham Palace, the project will have a less grandiose character than was originally suggested. With the sum likely to be at the disposal of the executive committee it would be impossible to carry out a large group of sculpture, an architectural screen, the alteration of roads and the transformation of the Mall throughout its entire length. The designs in their new form and on an adequate scale will be more easily understood by the multitude, and may have an influence in increasing the list of subscriptions. We have already described the various designs, and it will be remembered that the sculptured group represents a seated figure of the late QUEEN, as well as symbolic figures of the virtues by which HER MAJESTY was distinguished, the whole being surmounted by a figure of Victory.

THE Académie des Beaux-Arts has appointed a jury to examine and determine the relative value of the works submitted in the competition for signs. The members are M. VAUDREMER, architect; M. FRÉMIET, sculptor; M. CHAPLAIN, medallist; with M. BONNAT and M. LUC OLIVIER-MERSON as representatives of painting. The works are to be sent to the Hôtel de Ville, Paris, between November 1 and 15. The Municipal Council of Paris has agreed to bestow one premium of 2,000 francs, two of 1,000 francs, five of 500 francs and six of 250 francs. The competition originated with M. EDOUARD DÉTAILLE, and has excited much interest among the artist-decorators and painters of Paris. So many able artists may appear to be out of place as judges of signboards. But the French do not hold that opinion, and their foremost men are willing to put their dignity aside whenever art in its humblest forms may have to be considered. Toys are less important than painted or sculptured signs. In the approaching competition among the inventors of toys MM. GÉROME, FRÉMIET, DÉTAILLE, COUTAN and REGAMEY will form part of the tribunal. M. ROUJON, the official director of Fine Arts, M. SARDOU, the dramatist, M. HONORÉ, of the Louvre, M. CAILLETET, of the Académie des Sciences, and M. BOUSQUET, a Councillor of State, will also be among the judges, and they will be aided by specialists.

THE demolition of the fortifications of Paris will be more widespread than was at first contemplated. Like most other cities, Paris apparently has a tendency to move westward, and the ground occupied by fortifications adjoining the Bois de Boulogne was therefore coveted. It was, however, difficult to arrange matters with the municipal council. The War Department is not satisfied with abandoning the fortifications on the western side of the city; it has now decided to set back the long line on the northern and north-eastern boundaries, and to construct a new wall by which the Seine will be connected with the fortresses of Pantin, Aubervilliers and with the canal basins that are found near the abattoirs and cattle markets. The subject has given rise to several conferences between the Commission of Credits, the Ministry of War, and the Ministry of Finances. Eventually it has been decided that about 2,000,000*l.* will be expended on new military works. It is expected that double that sum will be derived from the building sites which will be created, in addition to the tax on the increased value which will be levied on owners of adjoining property.

MERCIER'S "Tableau de Paris" is one of those works which are praised by a few and blamed by the majority. He commenced it in 1781, and there is no doubt it helped to bring about the downfall of monarchy and aristocracy in the first Revolution. It was the forerunner of a great many modern descriptions of life, of which MAYHEW'S "London Labour and London Poor" is, perhaps, the most important

to English reformers. There is no doubt MERCIER exaggerated his chiaroscuro, but he was inspired by the spirit of the time, and he could not close his eyes to the abuses which then existed. Undeniably there are errors, but who could write on so large a subject and continue exempt from human fallibility? He has been ignored while less worthy men have been perpetuated by memorial statues. There is not even a street in Paris to commemorate him. It was therefore a wise act on the part of the Commission of Old Paris to advocate a few days ago the erection of a bust of the writer, who was familiar not only with the outsides of the houses of Paris, but with their interiors. It is proposed to place it in the Place de l'Ecole, which is near the house in which MERCIER lived. He was a member of the Convention, but he never succumbed to the spirit of revenge which was then rampant, although not one of the deputies could have been more acquainted with the extent of the wrongs perpetrated by the possessors of power in his day.

It may not be known to all inhabitants of the Metropolis that among the committees of the London County Council is one having charge of historical records. The most useful practice introduced by the Society of Arts of placing memorials on houses which were occupied by distinguished people has been transferred to the Council. The work has been only partially executed, for a great many buildings remain to be indicated by means of tablets. We cannot complain if the work is slow, for in Paris, where the spirit for commemorating is strong, work like that of the Society of Arts is left to a body of subscribers. The committee of the County Council has also resolved to take photographs of buildings before demolition, as well as measurements. One example is Christ's Hospital. The most important acquisition of the Council is No. 17 Fleet Street, which was probably erected in 1710. It is well to have at least one section of the Council's business which is unlikely to give rise to controversy.

THE examinations department of the City and Guilds of London Institute is henceforth to be styled the Department of Technology. The annual report just published and dated October 1902 announces an increase in the number of registered classes from 2,222 to 2,320, of students from 34,246 to 36,189, and of candidates for examination from 15,557 to 16,580. Arrangements are in progress for co-ordinating the technological work of the Institute with that of the Board of Education and the Scotch Education Department. The growth of the examinations is evident when it is found that in 1879 there were only 202 candidates' papers, while this year the number was 15,615. There were marked increases in the attendance in many of the subjects connected with the building trades, but it must be said that the failures are on an average rather high. In plumbers' work it was 56.4, and in the preliminary grade 67.3. In carpentry and joining it was 50.2 and in the preliminary 57.4. In brickwork the percentage of failures was 29.8, masonry 32.8, plasterers' work 16.3, painters and decorators' work 41.5. In builders' quantities the failures were 42.3. Taking the forty-nine subjects as a whole, the failures were 41.4. Last year they were 44.4. The Institute's examinations have been extended to India and some of the colonies. Undoubtedly good work is being accomplished, and without any expense to the country.

## ILLUSTRATIONS.

## MUNICIPAL BUILDINGS, DEPTFORD.

THE THREE PREMIATED DESIGNS: By (1) Messrs. LANCHESTER, STEWART & RICKARDS, (2) Messrs. S. B. RUSSELL & C. E. MALLONS, (3) Mr. A. J. GALE.

DESIGN by Mr. A. BRUMWELL THOMAS.



## THE SOCIETY OF ARCHITECTS.

THE nineteenth annual general meeting of the Society of Architects was held on the 23rd inst. at St. James's Hall, Piccadilly. Mr. G. Gard Pye, vice-president, occupied the chair. After the transaction of some formal business, Mr. F. W. Chancellor (Chelmsford) moved the adoption of the following report:—

A number of applications for membership has been received, resulting in twenty-nine elections to membership; twenty members have resigned, four have died, and three have been removed, the total membership being 597.

The number of students has more than doubled in the last two years, there being now thirty-eight names on the roll, fifteen having been added during the session. Two students have resigned. Considerable interest continues to be taken in the design and measured drawing competitions instituted from time to time, two such having been held during the session, the subjects being "A Design for a Shooting Box" and "Measured Drawings of a Church Porch or Font." The following were the successful competitors:—"Shooting Box," 1st, J. Algernon Hallam, London; 2nd, J. Nixon Scaife, Carlisle. "Church Porch," 1st, E. L. Hampshire, London.

At the ordinary general meetings the following papers were read and discussed:—Presidential Address, S. Trevel, J.P., F.R.I.B.A.; "Hammered Ironwork," W. Höfler; "Early British and Celtic Art," M. Sullivan; "Stained Glass," Herbert Bacon; "Ancient Lights," Walter C. Williams; "Ancient Hampshire Palaces," S. W. Kershaw, M.A.; "People's Baths," W. W. Thomas.

It having been represented to the Council that amongst the Board of Examiners in Science there appeared to be no architect to deal with "Building Construction," though the papers on this subject appeared to relate rather to architectural than engineering construction, the Council took the matter up and received an intimation that the question would be considered.

The Council having had before it the question of county surveyors and private practice, the matter was discussed and the following resolution unanimously passed:—"That this Society is of opinion that it would be in the best interests of the public if architects, surveyors and engineers holding official appointments were debarred from private practice."

The Council has noted with satisfaction the formation of a joint committee of the R.I.B.A. and the Surveyors' Institution to take into consideration the present state of the law with regard to ancient lights, and has intimated to the joint committee its willingness to afford them any information or assistance in its power. At the ordinary general meeting in March the following resolution was unanimously passed:—"That it be referred to the Council of this Society to take such action as may be necessary to promote some legislation to amend the existing law appertaining to rights of light." The matter is engaging the attention of the Council.

A special meeting of the Council was called in June to consider the resolution passed at a meeting of the Royal Institute of the Architects of Ireland relative to the proposed election of an architect by the Treasury, in connection with the erection of a college of science in Dublin. It was unanimously resolved, "That the sympathy of this Council be tendered to the Royal Institute of the Architects of Ireland in the attitude they have taken on the subject of the proposed election of an architect by His Majesty's Treasury for the erection of a college of science in Dublin, and it is the opinion of the Council that for an Irish work of this national character an Irish architect should be solely employed." A copy of the resolution was sent to the First Lord of the Treasury and to the Royal Institute of the Architects of Ireland.

At the Council meeting in November it was unanimously resolved that the gold medal of the Society be presented to Mr. Walter Emden (past president) in recognition of his services to the Society during the past four years; this was confirmed at the ordinary general meeting on the same day, and the presentation took place at the December meeting.

It has not been deemed advisable to take immediate steps to form branches of the Society in the provinces, as has been suggested, but the Council has under consideration the formation of students' sections in various centres, with the object of affiliating the younger members of the profession with the Society, and as a means of organising the entrance examinations in the provinces.

The Society has become an annual subscriber to the Architects' Benevolent Fund, and the Council desires to commend the fund to the notice of members as worthy of support.

The half-yearly examinations continue to attract many inquiries and an increasing number of candidates. This is largely due to the policy of the Council in extending the examinations into the provinces. A centre has been formed and examinations held in Manchester, as well as in London. The Council has appointed as examiners in section I, subject A, Messrs. R. F. Vallance, F.R.I.B.A., and S. Wyborn, in the places of Messrs. W. A. Bassett-Smith and J. W. Manning, resigned. The syllabus has been revised and materially strengthened.

In consequence of the death of Mr. J. Campbell, F.R.I.B.A., the local hon. secretary for Bombay, it became necessary to appoint a successor, and Mr. C. S. Stevens, of that city, has kindly consented to act. The Council takes this opportunity of thanking the local hon. secretaries for the assistance they have rendered whenever called upon, particularly in connection with the examinations.

On April 25, a large number of members availed themselves of the kind permission of His Eminence Cardinal Vaughan to inspect the Roman Catholic cathedral in course of erection at Westminster from designs by the late Mr. J. F. Bentley; the Very Rev. Dean L. G. Vere, one of the canons, conducted the party over the works. In the evening the members' annual dinner was held at the Prince's Restaurant, Piccadilly, the president, Mr. Silvanus Trevail, J.P., F.R.I.B.A., presiding over a large and representative gathering of members and their friends, and being supported by a number of distinguished guests.

On May 24 a well-attended field day was held at Winchester, and was very successful, the ecclesiastical, military and civil authorities having afforded special facilities for viewing the various buildings, &c., under their charge. The Right Worshipful the Mayor of Winchester and others joined the party at luncheon, the Mayor afterwards entertaining the members to tea at the Abbey House.

The Council continues to be fully alive to the necessity of increased activity in forwarding the statutory education and registration of architects. The President has addressed a meeting of West Country architects at Plymouth, where a unanimous vote was given in favour of the principle of registration, and from representations made to the Council it has been felt that the time has come when it should still more actively identify the Society with the movement, therefore the Council has appointed a committee to confer with the Architects' Registration Bill committee (a body of architects distinct from the Society) with a view to additional co-operation, or, if thought desirable, taking over its work.

At the invitation of the Royal Institute of Public Health and of the Sanitary Institute, the Council appointed the following to represent the Society at the Exeter and Manchester congresses:—Messrs. Silvanus Trevail, J.P., F.R.I.B.A., president; G. Gard Pye, a vice-president; Ellis Marsland, hon. sec.; C. Cole, local hon. sec., Exeter; and C. Caine, Manchester.

At the invitation of the newly-formed photographic survey of Surrey, the Council appointed Messrs. S. W. Kershaw, M.A., hon. member, and H. G. Quartermain, hon. treasurer, delegates from the Society on the committee.

The balance-sheet to be presented at the November meeting will show the reserve fund to have been largely augmented and the finances administered with due regard to the interests of the members and the efficient working of the Society. Considerably over 500*l.* has been placed to reserve during the session, the fund now amounting to 700*l.*, of which 500*l.* has been invested in 2½ per cent. Metropolitan Consolidated stock, the balance remaining on deposit at the bank.

A number of posts have been filled through the medium of the register, but it is not made use of to the extent it might be, and members and students are reminded that they have the free use of it and that it is conducted for their benefit.

It is satisfactory to be able to report continued progress in every department of the Society's work; the membership is higher than it ever has been at the corresponding period in any year, the examinations have become better known and appreciated, the various meetings have been well attended, and the members, especially the local hon. secretaries, have willingly assisted the Council in its work. It is the wish and aim of the Council to make the Society of more practical use to the members, particularly to those who, practising at a distance, are unable to keep in personal touch with headquarters. It is impossible to find out all the needs of members, but if the latter will assist the Council by making their wants known the resources of the Society can be developed in ways best calculated to advance their individual interests and promote the objects of the Society generally. Members should claim their privileges and use the Society's premises when in town; communicate with the secretary on any matter affecting their interests as members or their position as architects, or retain the services of the practice committee for advice on points of practice. The Council is always glad to receive, and if possible act upon, suggestions for extending the scope of the Society and the privileges of membership, but the future of the Society rests not so much with the Council as with the general body of members, for only with their co-operation can full advantage be taken of its continued and increasing prosperity and influence.

Mr. Chancellor expressed agreement with the resolution in favour of debarring county surveyors from private practice, but asked if "county surveyors" was intended to include surveyors under the Ecclesiastical Dilapidations Act.

The Chairman replied in the negative.



Mr. B. R. Tucker (London) seconded the motion, which was adopted.

The following officers and members of the Council for the year 1902-3 were elected:—*President*—Silvanus Trevail, F.R.I.B.A., J.P., Truro. *Vice-Presidents*—Walter W. Thomas, Liverpool; G. Gard Pye, London. *Honorary Secretary*—Ellis Marsland, London. *Honorary Corresponding Secretary*—W. R. Mallett, London. *Honorary Treasurer*—H. G. Quartermain, Merton. *Council*—R. G. Bare, London; W. R. Bryden, F.R.I.B.A., Buxton; Chas. Caine, Manchester; F. W. Chancellor, M.A., Chelmsford; W. Cooper, Hastings; J. W. Dyson, Newcastle-on-Tyne; W. L. Grant, Sittingbourne; W. J. Jennings, F.S.I., Canterbury; H. E. Knight, London; F. W. Macey, London; A. E. Pridmore, F.S.I., London; B. R. Tucker, London.

The following nominations were announced:—For membership—F. W. Chancellor, Winchester; P. H. P. Haigh, London; N. Austin Leech, London; C. H. Mead, London; T. Overbury, Cheltenham; H. Teather, Cardiff; C. L. Wilson, Cardiff; J. Wills, Derby. For studentship—H. J. T. Gowen, Norwich; H. Milne, Tewkesbury; J. E. Todd, Southsea.

The following gentlemen were then elected by ballot:—As a member—F. Broadbent, Leeds. As students—Noel F. Barwell, London; W. J. Pulford, Maldon.

The Chairman then presented the prize awarded to Mr. E. L. Hampshire for measured drawings in the Students' Competition.

### THE SURVEYORS' INSTITUTION.

THE land agents' committee of the Surveyors' Institution (Irish branch) met on the 21st inst. at their offices, 110 Grafton Street, Dublin. Major H. G. S. Alexander, F.S.I., presided, and there were also present Messrs. Toler R. Garvey, George F. Stewart, D.L., Hugh Galbraith, Maurice Knight, James Penrose, Alfred H. Wynne, Thomas Courtney Townshend, Chas. Dickinson, G. R. M. Hewson, Robert Sanders, G. de L. Willis, and A. B. Watson, LL.B., secretary.

The minutes of the last meeting having been read and confirmed, questions of interest to land agents in connection with the present public discussion of the land question, and also bearing on the expected Land Bill, engaged the committee during the greater part of the sitting. Subsequently communications from the Surveyors' Institution, London, were read, approving the Irish examination courses for the admission of land valuers and building surveyors (in which latter class are included architects and civil engineers) to the membership and F.S.I. diploma of the Institution. These examinations, adapted as to some minor points to requirements in Ireland, are practically identical with the English courses, and will be held simultaneously with the London examinations in March next.

### PREHISTORIC BRITISH POTTERY.

A PAPER on the "Oldest Bronze-age Ceramic Type in Britain, its Close Analogies on the Rhine, its Probable Origin in Central Europe," was prepared by the Hon. John Abercromby for the British Association. The oldest type of pottery in Britain is the "drinking-cup," for which it is proposed to substitute the shorter term "beaker." Thurman recognised three types, designated  $\alpha$ ,  $\beta$ ,  $\gamma$ . Type  $\alpha$  seems to be the oldest and  $\gamma$  to be derived from it;  $\beta$  has a different secondary origin from  $\alpha$ . Twenty-five interments are described in which the beaker was accompanied by ancient objects; three with large flint daggers, three with buttons with the V-shaped perforation below, and five with stone wrist-guards, all of which objects belong to the later neolithic period on the Continent. None of the objects found with the remaining fourteen interments are of later date than the thin, flat, broad knife-dagger. As no other ceramic type in Britain can show such a pedigree, it is clear that the beaker is the oldest, though before it died out several other types of fictilia came into use. The beakers found with food-vessels and burnt interments are shown by their form and ornament to belong to a rather late period. As ornamentation is a very important subject, fifty-nine examples taken from the three types were exhibited and contrasted. Some later developments are pointed out. The ornament, like the form, points to a different secondary origin for  $\alpha$  and  $\beta$ . The localities where beakers have been found in Great Britain and Ireland are shown on a map. Though  $\beta$  is the least represented numerically, it has the widest diffusion. It extends from the coast of Sussex to Sutherland—perhaps to the Shetlands—and is the only type at present known in Ireland. Ten photographic examples of type  $\beta$  from the Rhine, between Coblenz and Mainz, were compared with ten British. The ornament of the Rhenish examples is shown on a slide and compared. Some of the ornament on the Rhenish beakers is borrowed from a different type known as the "bell-shaped

beaker." This particular system of ornamentation is not found west of the Rhine Valley, south of the Danube, east of about the longitude of Vienna, or north of the latitude of Berlin.

The origin of type  $\alpha$  can only be suggested, not demonstrated. Its form seems derived from the much earlier Schnur-becher and its later offshoots. But the practice of distributing the ornament in zones or bands is probably owing to the influence of the "bell-beaker." Type  $\beta$  is derived from a type much more influenced by the "bell-beaker," though some examples of it are perhaps merely late modifications of the "bell-beaker." In type  $\alpha$  the influence of the "bell-beaker" is much less direct, so that, supposing both  $\alpha$  and  $\beta$  are offshoots of the "cord-beaker," they have different secondary origins, but go back to a common form at a point in time many centuries earlier. But the possibility is not excluded that the origin of  $\beta$  is to be referred entirely to the "bell-beaker," in which case  $\alpha$  and  $\beta$  have an independent origin.

The areas in Central Europe where the "cord-beaker" and its offshoots as well as the "bell-beaker" are found are Northern Bohemia and the region of the Saale, a western tributary of the Elbe. As a fully developed type  $\beta$  occurs on the Rhine, both at the centre of its course and near its mouth. From the Rhine it passed over to Britain.

### LONDON SCHOOL BOARD AND REHOUSING

AT last week's meeting of the School Board for London Mr. Lyulph Stanley brought up the report of the works committee with reference to the scheme for transferring the Board's liabilities for rehousing to the London County Council. The committee reported that they had considered a letter from the Home Secretary expressing the hope that, in view of the class of persons for whom the housing accommodation was intended some reduction of the proposed rentals might be found possible and stating that it would be necessary that the Board should give a bond of 10,000*l.* for the execution of the scheme.

A long discussion followed, with reference to the reply which the committee proposed to send to the Home Office. Ultimately, the letter was agreed to in the following form:—

"Sir,—The School Board have had under consideration the letter from the Home Office, dated August 28 last, with reference to the scheme for the transfer of the Board's liabilities for rehousing to the London County Council. In reply, I am instructed to state that the School Board are proposing to pay a sum of 10,359*l.* to the London County Council in consideration of the latter body taking over the liabilities of the School Board for the housing of 1,030 persons. Thus the School Board are already subsidising the cost of housing these persons so as to secure that they shall be accommodated at as low a rate as possible under the circumstances. The County Council themselves in their housing scheme estimate the return at 3 per cent. upon their outlay. As it is obvious that no private capitalist could undertake to build houses for the working classes, or any other persons, on a return of 3½ per cent., it will be seen that, in addition to this subsidy of 10*l.* per head, the rehousing scheme which has been approved by the Home Office will secure accommodation very much below the ordinary cost. If the meaning of the Home Office is to recommend that a cheaper system of construction be used so as to enable the London County Council to reduce the rents, while still obtaining a fair return for the capital outlay, they will forward the suggestion to the London County Council and request them to do all they can to meet the view of the Home Secretary. But if the suggestion of the Home Office is to lower the rent without lowering the cost of building, this seems to raise an important economic principle; and, although the correspondence on this subject has now been going on between the Home Office and the School Board for upwards of two years, this is the first time that the suggestion has been made. The School Board feel that the amount of the rents is, under the proposed arrangement, a matter for the County Council to fix; and, further, they doubt their power to draw upon the School Fund for any larger sum than the 10,359*l.* agreed upon with the County Council. With regard to the statement that the Board should give a bond of 10,000*l.* for the execution of the scheme, I am instructed to state that the Board were under the impression, from the previous correspondence of the Home Office, that the Home Secretary would be willing to accept the transfer of the Board's obligations to the London County Council, and that the position of the latter body would have been a sufficient guarantee to the Home Office for the carrying out of all these obligations without any bond being given by the School Board. If, however, the Home Secretary still insists that the School Board should give a bond of 10,000*l.* for the execution of the scheme, they are prepared to do so, and will forward a draft as requested.—I am, &c."



## EXAMINATION OF BUILDING CLASSES.

THE following are the reports on the results of the examinations of 1902 by the Department of Technology of the City and Guilds of London Institute:—

## CARPENTRY AND JOINERY.

(Professor T. R. Smith and Mr. S. Barter, *Examiners*.)

*Preliminary Examination.*—It is with regret that we have to again observe that the general standard of the candidates' work leaves much to be desired. The paper was easy, and the candidates were only permitted to answer ten of a total of fifteen questions. In previous years they were allowed to attempt as many of the questions as they could. The innovation was made with a view to preventing hurry and to give a wider field of choice. The arithmetic was better than in most papers of recent years, but was still not good. The plane geometry was by no means good. The simple question in solid geometry was the most commonly neglected of all, and where attempted was generally very badly answered.

The drawing was on the whole distinctly poor. It was inaccurate and showed ignorance of principles. The construction of a plane scale was commonly understood to mean a mere copy of a scale. The drawing of a cupboard front was frequently not attempted, and where it was made was badly drawn. Many who appeared to know what was wanted failed to make the drawing correctly, simply because they could not draw. There has been a steady deterioration for some years past in this drawing, and it would appear that elementary mechanical drawing is not satisfactorily taught in, by any means, all our schools. Too much teaching is attempted with insufficient exercise with the drawing tools. The grading of the candidates was rather remarkable. Good papers were in sharp contrast to bad ones, and the number of average candidates was comparatively small. This indicates apparently poor preparation in the classes, and the evidence of the papers of many of the failures confirms this view. In many cases it is surprising that candidates should have presented themselves at all. The work of the better candidates shows that at least some very good teaching is given, and the chief fault of the remainder is that they show signs of "cramming" rather than of steady preparation.

*Ordinary Grade.*—There was a sharp contrast between the good and the bad candidates similar to that noticed in the preliminary, but not quite so marked. Draughtsmanship was bad. Candidates appeared to know what was wanted, but to be unable to give expression to their knowledge in drawings.

*Question 3.*—The proportions of the mortice to the style of door were very defective. The joint is of the utmost importance to a joiner, and as nearly all candidates attempted this question affords a very sound test as to the thoroughness of the training of the candidates. So badly were the proportions chosen that in a large number of cases no thought at all seems to have been exercised in deciding this important matter. The position of the lock in the answers given frequently involved cutting away the strongest part of the joint made, and consequently weakening the joint in an altogether inadmissible degree.

*Question 7.* (Six leading joiners' joints).—Frequently all carpenters' joints were chosen, and where good joiners' joints are taken the proportions of the parts were very faulty. It could be well if teachers would carefully distinguish carpenters' from joiners' joints and make their pupils realise their general principles and objects. This is of the greatest importance in workshop and would render later teaching easier while at the same time affording opportunities for good drawing lessons. The sash and frame (sash hung on centres) in Question 6 were frequently correctly made and the whole answer spoiled by the manner in which the beads were cut. Windows made, as too frequently drawn, could not be opened. The simple geometrical problem in this question was clearly not understood.

*Questions 13 and 15.*—The trusses and bracing in the answers to these questions were used in impossible places and actual work would be decidedly detrimental, rather than relieving the object of their introduction. Some 20 per cent. of the papers were however really good, and a number of excellent ones were amongst these. Generally the work was better than that of last year, but the old fault—helplessness when deprived of the aid of text-books—was apparent. The questions were naturally not devised to enable the candidates to perform a feat of mere memory, but to test their intelligent utilisation of the principles of the study they had made, or should have made, of the subject.

*Honours Grade (Practical).*

The specimens of work submitted were, as a whole, very good, and amongst them were some very fine ones. The old fault of making small models of large pieces of work was still apparent. These specimens, while they make good teaching models, are not good tests of hand skill. Preferably candidates should make some detail of work, such as they have to make in a workshop. Many sent workshop rods with their work,

and for the honours stage this custom is better than that of rendering a drawing. The practice is strongly commended. The practical test contained a difficulty which was left entirely to the candidate's judgment to solve, and on the whole they did well. For a time test the work was of a high character. The draughtsmanship was very good, and a steady improvement has been noticeable during the past few years in this respect.

*Honours Grade (Written).*

The results of the written examination in the honours grade were in many respects satisfactory, the answers to questions on joinery being rather better than those to questions on carpentry. The drawings were, generally speaking, well executed, and showed familiarity with the preparation of working drawings. The tendency to draw and describe what can be got out of text-books in preference to that which would be learned from actual work by an observant craftsman is, unfortunately, too prevalent in the greater number of these papers. For example, the use of timber beams to carry floors over wide spaces has been completely abandoned since the introduction of girders of steel or iron, but in answer to a question on the construction of floors, candidates have constantly shown such beams, and not more than two or three have added that they are now obsolete, while a very small number indeed have shown the method which they must see being pursued in every building of any importance on which they work. Other answers to questions dealing with centering, with timber partitions, and with a timber roof of large span, such as might be used over a drill shed, include mistakes of the same nature, though it must in fairness be added that these answers also include good honest intelligent work. Answers to a question inviting the candidate to describe some failure of a piece of carpentry or joinery which had come under his personal observation, and to point out how the defect might have been avoided, brought out, together with some trivial cases, descriptions of serious failures, and show keen observation and a very intelligent grasp of the situation. Another question referring to dry rot and its cure showed generally a correct knowledge of the proper remedies; but many of the average candidates failed to grasp the very formidable nature of this disease and the great thoroughness with which it must be combated.

Turning to the joinery questions, most of the candidates showed a familiarity with the geometry involved in questions of setting out work (including one piece of somewhat difficult handrailing) and with the modes of framing joinery and securing it in place. Curiously enough, the greatest variation occurred in answering the simplest problem set, viz. the construction of a set of bookshelves to fit a recess. Some of the answers to this were remarkably imperfect. The best answers were elicited by a question requiring an important door with its appendages to be drawn, and the process of constructing it in a modern workshop to be described. In answering this question, especially the latter part of it, the candidate had to rely mainly upon his own observations, and the result has been on the whole very satisfactory. In conclusion, it is fair to add that the above remarks, so far as they are of a disparaging nature, apply chiefly to the work of candidates who failed to pass, and of those who obtained low marks, rather than to that of the men who are well placed. Many of the successful candidates are to be congratulated upon having done work which is not only free from any serious defects, but is excellent in its nature, and very intelligently set forth, both by writing and by drawings.

## BRICKWORK.

(Mr. H. W. Richards and Mr. R. Roberts, *Examiners*.)

In the ordinary grade there was a decided improvement upon the papers of previous years. There were very few candidates who had not attempted at least some of the questions. The honours grade still gives cause for complaint, and it would scarcely seem that the candidates had received the necessary careful instruction.

We again ask that the candidates should be more particularly requested to state where they gained their experience, as this is of great assistance in fairly judging the papers. This is equally necessary in brickwork and in masonry.

## MASONRY.

(Mr. H. W. Richards and Mr. H. D. Searles-Wood, *Examiners*.)

The answers in the ordinary grade were very satisfactory. The candidates displayed intelligence and did good drawings. The honours papers were again of a low standard, and it is difficult to imagine that the candidates had previously passed the ordinary grade.

## BRICKWORK AND MASONRY.

We are sorry to find that so few candidates presented themselves for examination, and recommend that more encouragement should be given to practical men to induce them to endeavour to gain these certificates. With few exceptions the candidates examined did not appear to have been thoroughly prepared.



We would urge the necessity of more general training in setting out. Before a student, either in brickwork or masonry, attempts to cut a piece of work he should without the aid of the teacher be able to prepare his own templates, moulds, &c. We found that two Institutes went to the trouble of forwarding to the examination centre complete sets of tools for the use of their own candidates. We wish that other Institutes would follow this good example, thus enabling their students to take the examination under more favourable circumstances.

#### PLASTERERS' WORK.

(Mr. W. Millar, *Examiner*.)

The number of candidates in the ordinary grade is slightly in excess of the number entered last year, and there is a decided improvement in the general knowledge of the trade, as shown by the answers.

With regard to the honours grade, I was pleased to find a marked improvement in the answers compared with last session. There were three creditable examples of practical work, but the others were not up to the average.

There seems to be a tendency on the part of the students, or perhaps the instructors, to confine their work to modelling instead of the more practical and everyday class of work, such as making models of cornices, arches, pediments, columns, panelled ceilings, raking mouldings, piece moulds, &c.

#### PAINTERS' AND DECORATORS' WORK.

(Mr. A. S. Jennings and Mr. H. G. Liley, *Examiners*.)

The papers are up to the average, although there is distinct evidence in many cases that the students have had little or no practice in writing answers. Teachers are again urged to give exercises in writing answers to questions on practical subjects, so that a candidate who possesses a knowledge of how a particular piece of work should be executed may be able without difficulty to write an answer that will render it clear to the examiners that he actually possesses such knowledge.

The written answers to questions this year show a marked improvement, some excellent papers being sent up. The practical work, however, is in many cases far from satisfactory. As more time was given to the preparation of the practical work this year it was expected that considerable improvement would be noticed, but this is far from being the case. The brush work is in many cases poor. The preparation of stencils does not appear to be properly understood, many of the students having failed to put in sufficient ties to hold the parts of the stencil together. The relief material which was decorated was in many cases most imperfectly done, the worst features of a design being frequently emphasised and the effect produced being decidedly bad. In a few cases the design of the relief material had been carefully considered before decorating it, but this was rather the exception than the rule. Perhaps the most conspicuous fault in the work submitted when considered as a whole was the very poor selection of colours when such selection was left to the students. A room finished in the colours shown in some of the panels submitted would be far from pleasing in appearance. Most of the students evidently need considerable instruction and practice in the selection of colour combinations for plain work. Some excellent examples of glass gilding were submitted; the lettering was fair and the graining generally good.

#### BUILDERS' QUANTITIES.

(Mr. F. Henniker, *Examiner*.)

A great increase is noticeable in the number of candidates this year. The percentage of passes is very satisfactory, being about the same as last year. Of the candidates who passed in the ordinary grade, the majority have passed well and have showed that they have been well taught, the answers being much better than last year. There were two questions which were very badly answered by many of the candidates, viz. No. 3 and No. 10. In the honours grade there were many very good papers, and the answers were on the whole better than last year. Question No. 4 was in a great many cases very badly answered.

#### PLUMBERS' WORK.

(Dr. H. R. Kenwood, Mr. George Taylor, Mr. W. H. Maxwell, *Examiners*.)

The improvement noted last session has barely been maintained, and elementary science questions are still either avoided or answered indifferently in a large proportion of the papers. The very general lack of knowledge of the underlying principles of chemistry and physics, in so far as they bear upon plumbers' work, is a matter to which the examiners would again direct the attention of instructors. The candidates should be informed that the majority of those who fail to satisfy the examiners fail on this account in both the preliminary and ordinary grade examinations. Candidates should also be taught to strictly confine their answers to the questions set.

Questions requiring freehand sketches of tools and apparatus have been exceedingly well answered, but there has been a great lack of ability shown in the attempts to represent con-

structional details by means of good clear effective sketches and in drawing details to scale.

A fairly intelligent knowledge has been shown by most of the candidates in the answers to questions on practical details of construction, but, as in the preliminary examination, the questions dealing with the principles of chemistry and physics are for the most part poorly answered; for instance, a large proportion of the candidates were ignorant of what constitutes "hardness" in water.

Although a large number of candidates have gained high marks in honours grade, there are many whose answers to questions on construction and methods of practically carrying out work are so incomplete that it seems incredible that the excellent practical work submitted should have been executed by the same candidates.

The quality of the work done in the practical examination reflects great credit on the instructors. There is greater uniformity in the mode of execution, and less error in setting out the work than in previous sessions.

The lead-burning test, forming part of the examination for the first time, has been most creditably executed, and this circumstance proves that it only requires perseverance and opportunity for practice to make this most useful and necessary part of plumbers' work more general in every branch of the industry than has hitherto been the custom.

It is very gratifying to the examiners to report that notwithstanding the fact that the standard of pass marks for the honours written examination has been raised, there is a large number of candidates who have successfully passed both the written and the practical examinations in the first class of each grade than in the previous session.

The Colonial candidates are fewer in numbers than in previous sessions, but they have fairly maintained the position of efficiency in both sections of the examination.

#### DIRECT REDUCING LEVELLING STAFF.

A DESCRIPTION of a new staff was submitted to the British Association by Mr. G. W. Herdman, B.Sc., Assoc. M.Inst.C.E. The object of this staff is to lessen the arithmetical work which is always necessary to obtain from the observation through the level telescope the actual height above datum (or "reduced level") of the spot where the staff is held. The staff may be any number of feet in length, and may be graduated according to any pattern which the user finds convenient. It differs essentially from the ordinary levelling staff in having a shoe which slides on the staff at the end with the maximum graduations, and which can be extended and fixed at any particular hundredth of a foot so as to lengthen the staff by the amount of that extension. The method of employing it is as follows:—Having set up the level, the height of the instrument or "collimation level" is obtained, as usual, by adding to the value of the "bench mark" on which the staff is held the reading seen on the staff. The shoe is now extended to the amount of the decimals in the collimation level, and in the field book beneath the collimation level is written the "datum level," which is the total length of the extended staff less than the collimation level. The "datum level" consequently is a whole number without decimals. All other observations from this position of the level are now taken with the staff inverted, i.e. the shoe on the ground, and the reduced level is obtained by adding the reading to the datum level. The amount by which the shoe is extended only has to be altered when the collimation level is altered, i.e. when the instrument's position has been altered. The booking as reduced levels of a large number of observations from one position of the level is extremely simple and rapid.

#### APPORTIONMENT OF GROUND-RENTS IN GLASGOW.

FOLLOWING upon the arbitration proceedings between Glasgow Corporation and Mr. Matthew Brechin, 15 Sandford Place, under which the amount of compensation for the value of the ground acquired by the Corporation and loss of amenity to the remaining property was determined, a petition was presented to the sheriff of Lanarkshire by the Corporation, says the *Glasgow Herald*, for the purpose of having it judicially determined what proportion of the ground annual of 1901 affecting the whole ground should be paid by the Corporation for the part thereof acquired by them compulsorily for the widening of Sauchiehall Street. The extent of the whole ground originally belonging to Mr. Brechin was 496½ square yards, and the portion taken by the Corporation was practically an eighth thereof. In the action to which Mr. Brechin and the holders of the ground annual were called as defenders the Corporation pleaded that the portion of ground acquired by them was a carriage-way and pleasure-ground, and was restricted to these purposes for all time coming; that the over-



man in the arbitration proceedings had valued the ground taken at 20%, and that the proportion of the ground annual of 15%, to be payable by them, should be 4s. 4d. per annum, being the proportion that the value of the part taken bore to the value of the whole. Mr. Brechin maintained in his defences that the Corporation should relieve him of the proportion of ground annual applicable to the area taken independently of value, viz. 1*l.* 17s. 6*d.* Mr. Sheriff Fyfe, before whom the case was heard, gave effect to Mr. Brechin's contention and awarded him twenty guineas of costs. The Corporation appealed against the sheriff-substitute's decision, and after hearing counsel on both sides, the sheriff-principal has now issued an interlocutor adhering to Sheriff Fyfe's judgment, with eight guineas additional costs. The following is Sheriff Berry's interlocutor:—

"Glasgow, October 20, 1902.—Having heard counsel for the appellants and the respondent Brechin, adheres to the judgment appealed against. Finds the appellants liable to the respondent Brechin in the sum of 8*l.* 8s. sterling of expenses and decerns therefor.

(Signed)

"ROBERT BERRY."

Note.—This appeal has been objected to as incompetent, but in the view I take of the case I think it unnecessary to deal with the question of competency. A written record has been made up, and no proof having been taken, written admissions have been lodged in place of it, so that the conditions required by section 139 of the Lands Clauses Act to the right of appeal from the judgment of the sheriff-substitute seem to be satisfied. Still as in the result I think the view of the case on the merits taken by the sheriff-substitute is correct, it is sufficient to dispose of it on that ground. The question between the parties, shortly, is whether the ground annual is to be apportioned according to area or according to value. The ground taken by the Corporation is no doubt of less value than the ground which has not been taken, there being a restriction against building on it, while on the remaining ground here is a dwelling-house of considerable value. It is, however, on the ground as a whole that the ground annual is secured; and I am not aware of any other principle of apportionment of the burden having been recognised where part of a piece of ground is taken compulsorily than the proportion which the extent of the part so taken bears to the extent of the whole. The rule in regard to the apportionment of feu-duties as laid down in the cases cited in the course of the argument presents an analogy in favour of that being the true rule to be applied in cases like the present. It is said that the rule may operate inequitably where, as here, different portions of ground are of different value. But difficulties might arise if action were given to the introduction of other considerations than that of area, and I am not prepared to give effect to the argument based on general views of equity which was submitted to me. With regard to expenses, I do not think there is any reason for my interfering with the sheriff-substitute's award. The respondent is entitled to the expenses of the appeal.

(Intd.)

R. B.

## RELATIVE PERMANENCE OF STEEL AND MASONRY CONSTRUCTION.

FORMAL papers, prepared with deliberation for delivery before an audience, or for publication in a periodical, are every excellent and desirable means for imparting information, but it is questionable whether, for the giving of information in an impressive and memorable form, they equal the more accidental method of viva-voce discussion, says the *American Architect*. It is this belief that leads us to quote at length the discussion that our fellow-professionals, the members of the American Society of Civil Engineers, recently held on the ever-interesting topic of the lasting qualities of modern methods of construction.

Charles G. Darrach, M.Am Soc C.E.—The speaker approaches this subject with some trepidation, as it is worthy of higher talent than he possesses.

To deal with the subject properly, there should be not only discussion, but contention and consultation, so that it may not be recorded among the dead by the epitaph which heads our publications:—"This Society is not responsible as a body for the facts and opinions advanced in any of its publications."

The speaker would suggest that the subject be amended so as to read, "Is metallic construction or the combination of metallic and cement concrete susceptible of being made as permanent a building material as masonry?"

Many years ago the late Julius W. Adams, then president of the Society, suggested to the speaker that it was preeminently the business of the engineer to adapt the motif of construction to the genius of the locality in which his field operations lay. This is, in fact, the chief business of the engineer, and is using the best and cheapest means for the end to be attained.

It must not be forgotten, however, in making comparisons,

that the best materials may be manipulated so as to produce inferior results, and the proper use of materials in composite engineering construction is as absolutely necessary as in the domestic arts which please our palates, for it is well known that the cook can either spoil the pie or make the pudding.

Before determining upon a method of construction there should be considered not only the first cost, but also the expense of maintenance. The ease of inspection during erection should also be considered, as well as the adaptability of the material to obtain the most economical results.

A knowledge of the relative strength of the various materials, and also of the causes for deterioration and decay, should be attained. With this knowledge the problems will reduce themselves to some degree of simplicity. This knowledge can then be supplemented by observation and experiment, so that there need be no reason to fear results. Knowing the disease, the remedy therefor can be obtained.

The idea that masonry is the sine qua non of all permanent construction seems to the speaker to be without foundation. Permanence of masonry construction depends not only upon proper design, but also upon perfect workmanship. All who have had any experience in construction know well that the most trying and difficult task of the engineer is to have masonry properly erected. In masonry construction, dependence must be placed upon the physical value of the stone, sand and cement. The stone, being a natural product, may or may not have that degree of permanence expected by the engineer, and to meet this contingency a large factor of safety is generally introduced in the calculations for masonry construction. Also, in many cases where masonry is used, it is impossible to design the structure so that the economical quantities of material to meet necessary requirements can be used.

As has been intimated, masonry, as well as metallic construction, may be subject to deterioration and decay.

In using metallic construction, it is possible to calculate the stress upon the structure with a far greater degree of accuracy than can be applied to a masonry structure; consequently, the factor of ignorance can be reduced and the quantity of material used be nearer to that which is theoretically required. Inspection during construction and erection and after completion is more convenient, and, knowing the causes for deterioration, the necessary remedies and protection may be readily applied.

The use of concrete or artificial stone appeals to the speaker with much force. By its use artificial stone of equal value throughout the entire content can be obtained, and that value can be determined in direct accordance with the material of which it is made, so that the composition of the artificial stone can be adapted directly to the use for which it is intended. The cost of construction for equal values in artificial stone is generally much less than if natural stone were used.

Artificial stone or concrete forms a protection against the usual deterioration of metallic construction by atmospheric influence.

The logical conclusion seems to be that the best method of construction would be composite, using artificial stone and metal. Artificial stone or concrete not only forms a protection for the metal, but adds its value in resisting stress, and, except in subterranean and subaqueous structures, the deterioration of metal encased in cement concrete of proper composition may be disregarded.

There are many examples of structural metallic work encased in concrete where no deterioration is shown, even from ancient times. The modern system of iron construction encased in concrete or brick masonry, used in high office buildings, shows that, when properly constructed, there is no observable deterioration in the metallic work. The Drexel building, Fifth and Chestnut Streets, Philadelphia, was constructed in the years 1886-87. The speaker has removed portions of the ironwork in that building, and could see no deterioration whatever.

In the year 1891 the speaker made a cement floor and walk over a pipe-tunnel, the upper surface of which was exposed to all atmospheric influences. This floor was of cement concrete, about 4 inches in thickness, and had a span of about 5 feet. It was reinforced by bands of ordinary chicken-wire fencing, 16 inches in width, laid across the tunnel and spaced 16 inches apart. A bed of mortar, composed of cement and sand, about 1 inch thick, was laid upon a horizontal plank centre, and brought up flush with the top of the side walls of the tunnel. Over this mortar the chicken-wire was laid, extending over the side-walls. The cement-concrete floor, 3 inches in depth, was laid upon this chicken-wire, and finished, the walk being about 7 feet wide. Although this walk has been in use for eleven years no deterioration is apparent, nor has there ever been any leakage even during the most severe storms.

In relation to this, attention is called to what the speaker considers faulty construction. The concrete floors of most office buildings are of cement and ashes or cinders. The resultant concrete is not impervious. The large quantity of



water used in construction is retained within the exterior skins of these floors for a long period, and no doubt is a detriment to the metallic construction of the floors.

In the year 1884 the speaker constructed a waterworks well at Redbank, N.J. This well was some 15 feet in interior diameter, and was sunk from the surface of the ground to a depth of about 60 feet. The lower half, or 30 feet, was below the ocean level, and the entire well, to within 5 feet of the surface of the ground, was under the ground-water level. The water rose in the well to within 8 feet of the surface of the ground, so that the well casing, 20 inches in thickness, constructed of hard brick laid in Portland-cement mortar, was continually in contact with water on both sides, and at times, even during construction, was under a pressure from the outside of more than 40 feet.

For reinforcing the brick shell during sinking,  $\frac{7}{8}$ -inch iron rods were extended from the cutting-curb upward through the masonry, and at intervals of about 6 feet large wrought-iron washers were placed over the rods and extended around the entire circumference of the well-casing. This construction was adopted to reinforce the green masonry of the casing during the operation of sinking. It would be interesting to examine this ironwork for the purposes of discussing this subject.

In the speaker's opinion the hue and cry raised in relation to a properly constructed iron skeleton in modern high buildings is without foundation.

In buildings where the ironwork is concealed within fire-proofing or concrete, there is little reason to suppose that any deterioration takes place, and the speaker will venture to state that, if the temperature and the humidity of the atmosphere immediately adjacent to the metallic structural work were observed and recorded, there would be found but little, if any, difference throughout the year.

Greater care, and concrete richer in cement, should be used for subterranean and subaqueous composite construction, and in some cases it would be advisable to use an asphaltic concrete so as to absolutely prevent the possibility of any moisture coming in contact with the metal.

The numerous cases of electrolysis in subterranean metallic pipes suggest a criticism which has not as yet been presented to the speaker. Is it not possible that, in subterranean and subaqueous work, metal, even when constructed in cement concrete, may be subject to electrolysis similar to that experienced in metallic water and gas-pipes? The speaker is of the opinion that all such subaqueous and subterranean constructions should be laid, as heretofore indicated, in an asphaltic concrete, and efforts should be made to force our legislators to pass laws preventing the use of the ground for an omnibus commercial electrical conductor.

We can also substitute for cast and wrought-iron pipes a cheaper and more permanent conduit, constructed under the composite system. The capacity of metallic water-pipes is materially diminished by the formation of nodules on their interior surfaces, and with some waters the life of iron pipes is merely a question of a very few years.

Composite pipes, constructed of concrete reinforced by metal, can be constructed so as to have the necessary strength without the loss of conductivity due to the metal nodules, and it is not necessary that the concrete of which they are composed should be of such richness as to absolutely prevent at first the transmission of moisture, except when the liquid conducted is free from suspended matter. Conduits carrying either turbid water or sewage soon fill up the pores in the concrete and make it impervious.

In 1894 the speaker constructed a septic tank for the Insane Asylum at Wernersville, Pa. The diameter of the tank was 25 feet, and the depth of water was 14 feet. The well was constructed of hard brick, laid in Portland cement mortar, and had a maximum thickness of 21 inches. There was an inside coating of plaster,  $\frac{3}{4}$  inch thick, made of equal parts of Portland cement and sharp sand. Tests were made through a period of ten weeks, at the end of which time masonry was practically impervious.

There is a paucity of experimental knowledge as to the strength of composite construction; the field is wide, of great importance, and deserves the attention and study of the members of our profession.

Before closing, the speaker would suggest that further experiment be instituted as to the possibility of making a metallic weld to avoid as much as possible the use of bolts and rivets. He is aware that the electric weld does not give a resultant value of 100 per cent., but he is of the opinion that the Society would be gratified with a knowledge of the best results so far obtained.

(To be continued.)

**The Venetian Municipality**, it is understood, will have to bear the cost of the re-erection of the Italian Campanile without any aid from the Italian Government.

## TESSERÆ.

### Sta Sophia.

THE progressive changes in domical edifices, from the circular drum, supporting a dome of equal diameter, as in the Pantheon, to the octagonal base, as in the temple at Spalato, to the square base with pendentives in the four corners, and, finally, to that triumph of constructive skill, the church of Sta Sophia, where a vast cupola rests upon arches springing from four piers only, furnishes the most interesting and instructive example of the successful development of general forms in Byzantine architecture. In the magnificent Christian temple built by Justinian we find the largest attainable space devoted to the celebration of ceremonies in which one vast congregation was expected to unite. Fergusson remarks "that no domical building of modern times can at all approach Sta Sophia, either for appropriateness or beauty; and that, if we regard it with a view to the purposes of Protestant worship, it affords an infinitely better model for imitation than anything our own Mediæval architects ever produced." It would, indeed, be impossible to imagine a scene of more impressive grandeur and of more religious solemnity than this vast building during the nights of the Mohammedan festival of the Ramazan, lighted by innumerable lamps, glittering in the spreading vaultlike stars in the firmament, the area thronged by thousands of earnest worshippers, prostrating themselves as one man under the guidance of the one leader of their prayer. The gradual corruption of Roman art, less distinguishable in the general forms, may be traced with the greatest minuteness in the details. Thus the architectural ornaments of the church of St. John at Constantinople (built between the time of Constantine and Justinian) form the link between the more Classic forms of pagan Rome and the frieze and entablature of the bastard Ionic order of the church of Saints Sergius and Bacchus, and of the bastard Corinthian of Sta Sophia. After the erection of Sta Sophia further modifications took place, but the essential features of the corrupted Roman style were still preserved.

### Keynsham Church.

The date of the foundation of the parish church of Keynsham, the tower of which is a familiar object to travellers between Bath and Bristol, is unknown, but it was appropriated to the neighbouring abbey in the year 1292. The oldest portion of the building, and probably coeval with its foundation, is the chancel. This is Early English in character; in its north and south walls are lancet windows, but all blocked up to afford space for mural monuments within. The awful accident which destroyed the ancient tower, and led to the erection of the stately western one, beneath which is now the principal entrance to the church, is described in a most rare and curious Church-brief, issued in the ninth year of Charles I., for the reparation of the fabric. It is stated in that document that "the parish church of Keynsham, a very fayre, large and substantiall church, and a great ornament to the sayd towne, is lately most lamentably ruined by reason of a most disasterous misfortune by tempestuous weather, happening upon the thirteenth day of January 1632, which continued in a most fearfull manner, being intermixed with hideous clapps of thunder and flashes of lightning, about sixe of the clocke in the afternoon of the same day, and by reason of the force thereof in a moment threw downe the steeple or spire of the tower, which with the fall thereof crushed downe likewise the greatest and principallest parte of the body of the said church, chancel, vestry, pulpit and seates, and defaced the pavement also. And the tower being therewith erased from the top to the foundation, and the glasse windows for the most part utterly rent and torne; and that part which is standing is subject to a further ruine unlesse some speedy course bee forthwith taken. The repaying of which ruynes and decayes as aforesayd, by the judgment of men well experienced in such workes, will amount unto the summe of sixe hundred nynety, or seaven hundred pounds at the least. The said parishioners being men of small ability (they for the most part being poore handicraftsmen) are of themselves, though willing, utterly unable to undergoe this so great a burthen, and are likely by reason of their inability to become destitute of a church for the celebration of Divine worship. And therefore they have most humbly besought us, &c. The repairs from the proceeds of this brief took place in 1634. The new west tower was erected chiefly from material afforded by the ruins of the adjoining abbey church. The noble tower is of mixed Perpendicular and debased work, but very effective in its general character.

### The Faun of Praxiteles.

The being represented is endowed with no principle or virtue, and would be incapable of comprehending such, but he would be true and honest by dint of his simplicity. We should expect from him no sacrifice or effort for an abstract cause; there is not an atom of martyr's stuff in all that softness of marble, but he has a capacity for strong and warm attachments and might act devotedly through its impulse, and even die for it at need. It is possible, too, that the faun might be educated



through the medium of his emotions, so that the coarser animal portion of his nature might eventually be thrown into the background, though never utterly expelled. The animal nature, indeed, is a most essential part of the faun's composition, for the characteristics of the brute creation meet and combine with those of humanity in this strange yet true and natural conception of antique poetry and art. Praxiteles has subtly diffused throughout his work that mute mystery which so hopelessly perplexes us whenever we attempt to gain an intellectual or sympathetic knowledge of the lower orders of creation. The riddle is indicated, however, only by two definite signs—these are the two ears of the faun, which are leaf-shaped, terminating in little peaks, like those of some species of animals. Though not so seen in the marble, they are probably to be considered as clothed in fine downy fur. In the coarser representations of this class of mythological creatures there is another token of brute kindred—a certain caudal appendage, which, if the faun of Praxiteles must be supposed to possess it at all, is hidden by the lion's skin that forms his garment. The pointed and furry ears, therefore, are the sole indications of his wild, forest nature. Only a sculptor of the inest imagination, the most delicate taste, the sweetest feeling and the rarest artistic skill—in a word, a sculptor and a poet too—could have first dreamed of a faun in this guise, and then have succeeded in imprisoning the sportive and frisky thing in marble. Neither man nor animal, and yet no monster, but a being in whom both races meet on friendly ground. The idea grows coarse as we handle it, and hardens in our grasp. But if the spectator broods long over the statue he will be conscious of its spell; all the pleasantness of sylvan life, all the genial and happy characteristics of creatures that dwell in woods and fields, will seem to be mingled and kneaded into one substance, along with the kindred qualities in the human soul. Trees, grass, flowers, woodland streamlets, cattle, deer and unsophisticated man. The essence of all these was compressed long ago, and still exists within that discoloured marble surface of the faun of Praxiteles. And after all the idea may have been no dream, but rather a poet's reminiscence of a period when man's affinity with nature was more strict, and his fellowship with very living thing more intimate and dear.

#### Influence of the Basilica.

The rise of the first edifice of Christian worship, not out of the Jewish temple or even the Jewish synagogue, but out of the Roman hall of justice, may be regarded as no inapt illustration of early Christian history. We are often reminded, both *bonam et malam partem*, by the polemics of opposite schools of the identity of early Christian customs and institutions with those of the older dispensation. Few topics have been more popular in modern times, whether in praise or blame, than the Judaic character of the worship, ministry and teaching of the three first centuries. But the indisputable share which the Gentile world has had in the material buildings of the Christian church, immediately suggests a doubt whether it may not have also contributed something to the no less complex structure of its moral fabric. The influence of Judaism on the first century was undoubtedly very great. On the one hand, the early sects had all more or less something of a Judaizing character; on the other hand, even the Apostles could not have been what they were had they not been Jews. But the fall of Jerusalem was in truth the fall of the Jewish world—it was in itself a reason for the close of the apostolic age—a death-blow to the influence of the Jewish nationality on the future fortunes of the world at large. Something, no doubt, both of form and spirit lingered on in the institutions of that great society which sprung out of its ruins; but Judaism itself had perished, and however much the mere ceremonial and superficial aspect of the Patristic age may bear a Jewish physiognomy, it is to the influences at work in the social fabric of the Roman Empire itself that we must seek the true springs of action in the Christian Church—so far as they came from any reign source. It is therefore with something more than a mere artistic interest that we find the bishop seated on the chair of the prætor—the forms of the cathedral already wrapt up in the halls of Æmilius and of Trajan. It is in exact accordance not only with the more general influence to which the Christian society was exposed from the rhetorical subtleties, the magical superstitions, the idolatrous festivals and the absolute habits of the heathen world at large, but also with the more especial influence which the purely political spirit of the Roman State exercised over some of their most peculiar institutions—with the fact that the very names by which the actions of their officers are described sprung not from the religious but from the civil vocabulary of the times—and are expressions not of spiritual so much as of political power. *Ordo* (the origin of our present "orders") was the well-known name of the municipal senates of the empire; *ordinatio* (the original of our "ordination") was never used by the Romans except for civil appointments; the "tribunes of the people" are the likeness which the historian of the Decline and Fall" and the author of the "Church of the

Fathers" alike recognise in the early Christian bishops; the preponderance of the Gentile spirit of government and the revival of the spirit of the Roman Senate in the counsels of Cyprian was the thought which forced itself on the mind of the last English historian of Rome in spite of many earlier prepossessions; even the Papacy itself, according to the pregnant expression of Hobbes, which, however inadequate as a complete account of it, is yet true as far as it goes, was but "the ghost of the dead Roman Empire sitting upon the grave thereof." The free spirit of the Roman citizen felt that it could breathe nowhere so freely as in the bosom of the Christian society. The Christian minister felt that no existing office or title to power was so solemn as that of the Roman magistrate, and Christianity could pay no more striking act of homage to the greatness of the expiring Empire than in this declaration of this belief, unconscious if we will, that the hall of Roman justice was not too secular for a place of Christian worship.

#### The Aquitanian Style.

The Aquitanian architects of the later Roman period seem to have altogether forsaken the traditional type of church handed down from the basilicas, which had existed in earlier times, and which afterwards came in again. The churches of southern Gaul during the twelfth and thirteenth centuries forsook the received type of nave and aisles, of pier-arch, triforium and clerestory, which runs through all other western Mediæval architecture irrespective of time and place. They rejoiced in enormously wide naves, without aisles, composed of a few very wide bays, and in the most perfect examples each compartment is covered with a dome. This arrangement seems to have gradually supplanted the older arrangement which lasted down to the eleventh century. The great abbey of Saint Sernin at Toulouse—the chapel of the White Tower on a gigantic scale—with its pier-arches, triforium and barrel-vault, is a manifest case of transition between the two. This church was consecrated by Pope Urban II. in 1090. In the course of the next century the other form became predominant. We see it in its perfection in the cathedral of Angoulême, and, with a more distinctly Byzantine character, in the domical parts of the famous Saint Front of Périgueux.



#### Royal Scottish Academy.

SIR,—Allow me to correct some inexcusable mistakes which occur in a short paragraph regarding the Board of Manufactures which appeared in *The Architect* of Friday last. I say inexcusable mistakes, because a writer so ignorant of the position and aims of the Scottish Academy ought to have refrained from commenting on these till the report of the committee of inquiry had been published and laid before Parliament. When that has been done, I may have more to say on the subject, but meantime I shall only refer to two misstatements.

We are told that the occasion of the pending inquiry "has been seized by the Royal Scottish Academy to make an effort to become free of the tutelage of the Board." That is absurd, as the Academy is not and never was under the tutelage of the Board. The Academy did not go before the committee, as you assert, to ask anything for itself except that its existing rights should be respected, but as the representative art body in Scotland, and under a proper sense of its charter obligations in that respect, it felt bound to avail itself of the opportunity to protest against the continued neglect by Government of the interests of the Scottish National Gallery, and to claim that it should be put on a footing not less favourable than that of the National Gallery of Ireland, both in respect of accommodation, annual grant and administration.

The Royal Hibernian Academy, to which you make reference, receives an annual grant of 300*l.*, while the Royal Scottish Academy receives no grant and has asked for none; but notwithstanding this, it has not "insisted that it should be emancipated from the duty of teaching," as you wrongly assert, nor has it suggested anything of the kind. It continues, as it has done for years, willingly and as a matter of duty to maintain a life school at a cost of nearly one-third of its annual income, where students who have given satisfactory evidence that they are sufficiently advanced to profit by it, receive free tuition.—Your obedient servant, JOHN HONEYMAN, R.S.A.

23 West Cumberland Street, Glasgow:

October 28, 1902.

#### Consulting Electrical Engineers.

SIR,—As one of thousands deeply interested in the question of the propriety of architects and engineers receiving "trade or other discounts, or surreptitious commissions or allowances,



in connection with works they superintend," I congratulate the Council of the Institution of Electrical Engineers on the publication in your issue of the 24th of their rules governing consulting engineers, but it deeply concerns us to know whether these practices are indulged in or allowable in the case of architects and engineers other than "consulting." I am told it does occur.—Your truly,  
W. LECKIE.  
23 Brook Street, W. : October 27, 1902.

#### Glasgow and West of Scotland Infants Mistresses' Association.

SIR,—The above Association is anxious to arouse the interest of architects, and especially of those who have to do with school architecture, in regard to the construction of infant rooms, and with a view to this they have been advised to send you a copy of the resolutions passed at a meeting of the Association on Friday, 27th inst., in the Religious Institution Rooms, Glasgow. A paper on the subject had previously been read by Miss Thomson, F.E.I.S., Gorbals School, Glasgow. The resolutions are as follows:—

1. The infant department should be provided with a series of rooms. No large room.
2. The rooms should be:—
  - (a) Situated on the ground floor, having a sunny exposure.
  - (b) Nearly square, and accommodating not more pupils than the number fixed by the code for a certificated teacher.
  - (c) Constructed so as to allow the same floor space as for older pupils.
3. For teaching drawing, blackboards should be fixed along the walls and additional movable apparatus supplied.
4. The drill hall should not be the well of the school and should be situated so as not to interfere with the work of the classes.
5. There should be sufficient cloakroom accommodation and wash-hand apparatus on the trough system.
6. In addition to the usual means of heating, there should be one or two fires in connection with the infant department.

The Association will be glad if you can see your way to insert this in an early issue of your paper.—I am, Sir, yours faithfully,

A. STUART PATERSON, hon. Secretary,  
Glasgow and West of Scotland Infants Mistresses' Assn.  
Dalmarnock School, Glasgow :  
October 27, 1902.

#### GENERAL.

**The King** has been graciously pleased to accept a portrait of the late Empress Frederick (when Princess Royal), drawn from life by the late Mr. E. M. Ward, R.A., in 1857. It has been presented by Mrs. E. M. Ward, the widow of the Academician.

**Her Majesty the Queen**, accompanied by Her Royal Highness the Princess Victoria, and attended by the Countess of Lytton, the Hon. Charlotte Knollys and the Hon. Sidney Greville, visited the French Gallery in Bond Street, and inspected the selected pictures and studies by Professor Corrodi, of Rome.

**Lieutenant-Colonel Horatio A. Yorke**, inspector of railways for the Board of Trade, told President Roosevelt that he had found many points of superiority in the American railways over the English, and had decided to recommend to the Board of Trade that several American appliances especially calculated to protect life and property should be adopted in England under statutory requirement.

**The Home Secretary** has appointed a committee to inquire into the use of electricity in mines and the dangers attending it, and to report what measures should be adopted in the interests of safety by the establishment of special rules or otherwise.

**Mr. J. H. Whitehouse**, hon. secretary of the Ruskin Memorial Scheme Committee, appeals for contributions towards the 3,000*l.* required for the completion of the village library, art gallery and museum at Bournville, of which Lord Avebury laid the foundation-stone last week.

**Sir Frederick Bramwell** has informed the Portsmouth Town Council that he is prepared to undertake for a fee of 500 guineas the work of advising the Council upon the question of removing the flooding in the low-lying districts of Southsea. If the work were entrusted to his firm the 500 guineas would be credited against the firm's fees of 5 per cent.

**The Nave** of St. John the Evangelist, Preston, Sussex, was dedicated on Sunday. The nave is over 100 feet long and 30 feet wide between the columns, the aisles being 12 feet wide, and the total width of the church is 60 feet. The roof principals are of pitch-pine, the remainder being executed in fir. The east end of the nave is surmounted by a bell turret of graceful design, the summit of which is 110 feet from the ground. The designs were prepared by Sir A. Blomfield & Sons.

**Mr. A. W. Ward** has been appointed deputy borough engineer of Portsmouth at a salary of 250*l.* per annum, rising to a maximum of 300*l.*

**The Exhibition** of the New English Art Club will be opened for private view on November 8 at the Dudley Gallery.

**The New Museum** of Egyptian antiquities in Cairo, which was designed by M. Marcel Dourgnon, of Paris, is to be inaugurated on November 15 in the presence of the Khedive.

**A Technical Institute** is to be erected in Poplar by the London County Council. The building will be opened in about twelve months' time, and will be used as a centre of instruction mainly for the mercantile marine and engineering and ship-building trades.

**M. Haniel**, a Prussian manufacturer, has presented the Mayor of Düsseldorf with 100,000 marks for the purchase of pictures and works of art for the municipal museum, in order to commemorate the great success of the exhibition held in Düsseldorf.

**The Bishop of Brisbane**, who has been in England for some months endeavouring to raise money for the building of Brisbane Cathedral, pleads for 7,000*l.* by the end of the year. The sum required for the first part of the building is 16,000*l.* in excess of what he has as yet received.

**Professor Dragendorff**, of the University of Basle, has been appointed Director of the Royal Commission of the German Imperial Archæological Institute.

**M. Leopold Bernstamm** has completed a bust of Antoine Rubinstein, pianist, which is to be placed in the Conservatoire of St. Petersburg.

**Mr. Pierpont Morgan** has lent his collection of pictures by Fragonard to the Glasgow Art Gallery.

**A Committee** has been formed, with Sir Thomas Drew as chairman, for the holding of an annual "winter exhibition" of Old Masters at the Royal Hibernian Academy, on the lines of those at Burlington House.

**Mr. T. Francis Bumpus** will shortly publish his "Holiday Rambles among the Cathedrals and Churches of Northern Germany" as a companion volume to his "Summer Holidays among the Glories of France." It will be amply illustrated.

**Mr. J. C. Hawkshaw** will deliver his presidential address to the Institution of Civil Engineers on Tuesday next at 8 P.M.

**The Archbishop of Cape Town** was present at a meeting of the Cape Town Cathedral Memorial Fund at the Church House, Westminster. He brought with him for the inspection of the committee the architect's drawings of the memorial chapel, and these drawings can now be seen at the office of the fund, Church House, Westminster.

**Purchase of the Royal Aquarium** site and buildings by the incorporated trustees of the Wesleyan Methodist Church has now been completed for 330,000*l.* Though the property comes into their possession at the end of January next, some months must elapse before the present building can be removed.

**The New Baths** at Small Heath, Birmingham, were opened on Wednesday. The buildings were designed by Mr. Henry Martin, and have cost 37,000*l.*

**A Meeting** of artists and others interested in artistic copyright was held on Tuesday afternoon at 39B Old Bond Street for the purpose of considering a proposal to form a society for the protection of British artistic copyright at home, in the Colonies and abroad. Mr. G. W. Agnew presided, and there was a good attendance. At the outset it was determined that the proceedings should be conducted in private.

**The Annual Report** of the Manchester Institution states that as the negotiations with the Manchester Corporation are settled, "it is hoped the committee will speedily decide what is to be the future scope of its work, so that there need be no delay in either extending the present galleries or building new ones, as soon as it has been decided whether or not an art gallery is to form part of new buildings on the Infirmary site."

**The Birmingham Corporation** adopted the following amendment on Tuesday:—"That the consideration of the report of the general purposes committee so far as it relates to the continuation of Corporation Street be deferred until the committee has had an opportunity of communicating further with the Local Government Board on the matter."

**The Annual Report** of the Manchester paving, sewerage and highways committee, which has been prepared, gives some interesting particulars about the cost of repairing and maintaining street pavements during the year. In the Manchester district 12,274*l.* was expended, in Chorlton 4,594*l.*, Hulme 4,784*l.*, Ardwick and Beswick 2,071*l.*, Bradford and Clayton 1,617*l.*, Newton Heath 1,486*l.*, Blackley and Moston 3,367*l.*, Crumpsall 547*l.*, Cheetham 3,620*l.*, Harpurhey 348*l.*, Openshaw 812*l.*, Gorton and Kirkmanshulme 5,186*l.*, Rusholme 2,416*l.* The total thus expended is 43,122*l.* During the year 1 mile 511 yards of new sewers was laid, at a cost of 4,202*l.*



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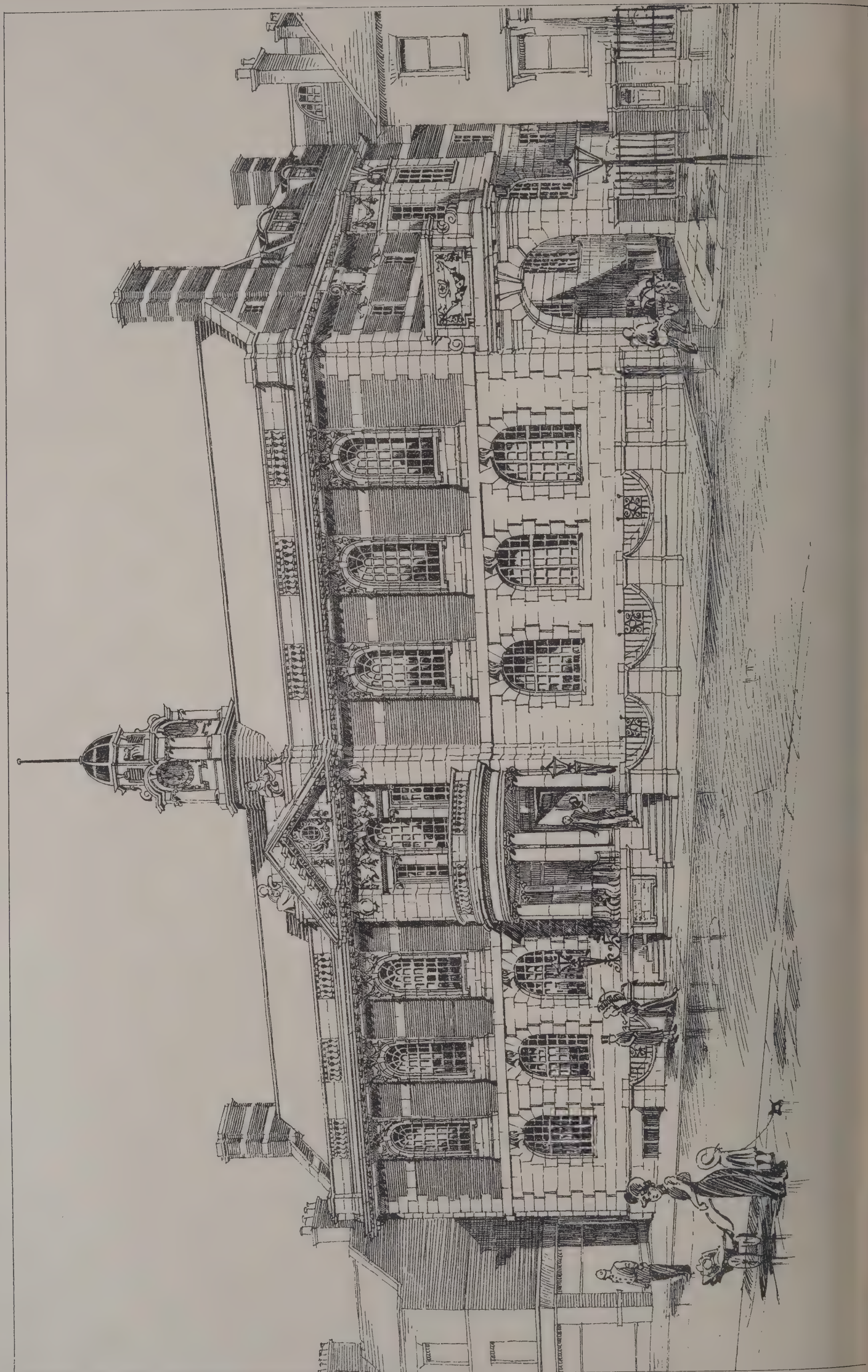
MUNICIPAL BUILDINGS, DEPTFORD.

Design by A. BRUMWELL THOMAS.



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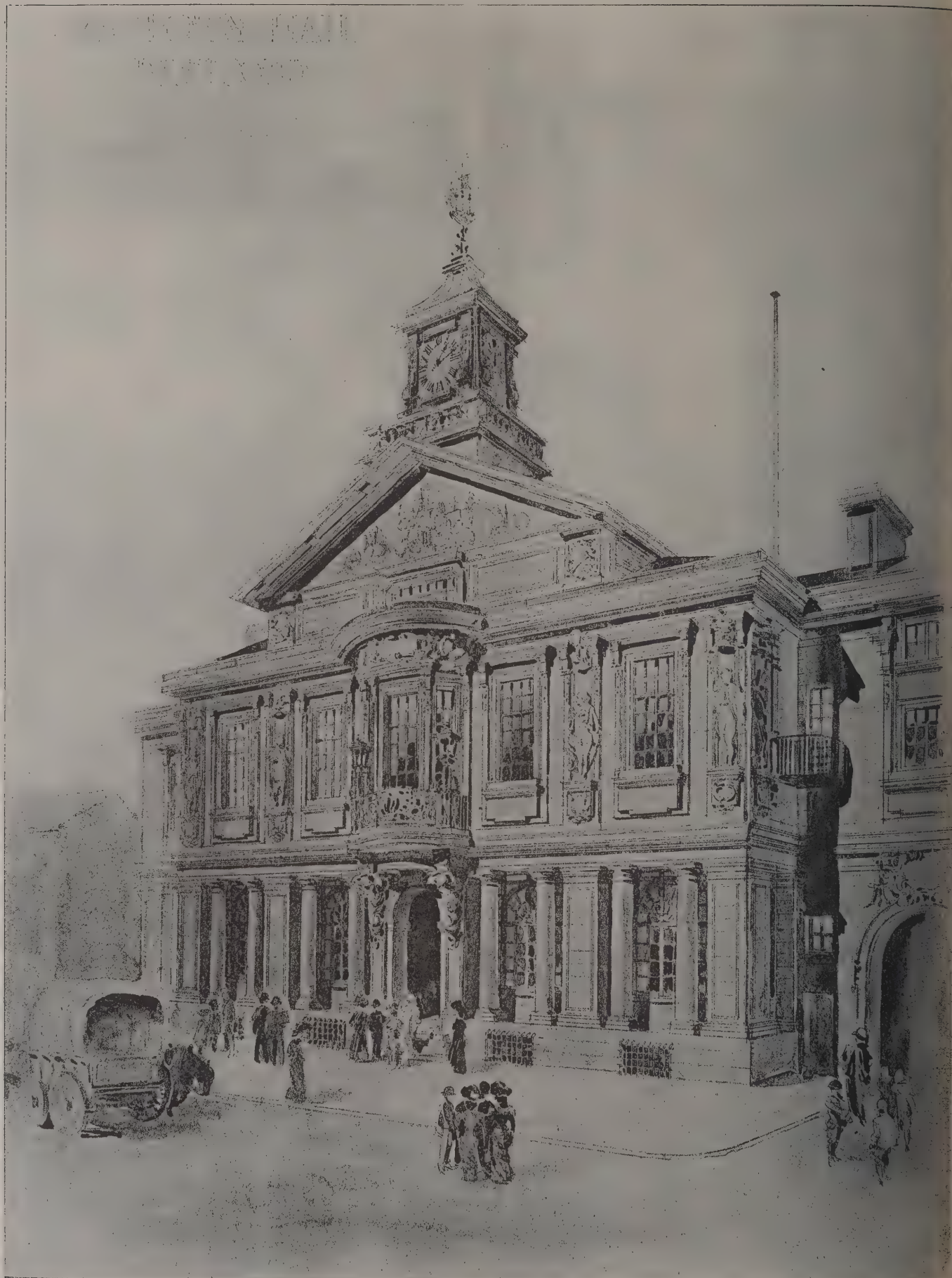




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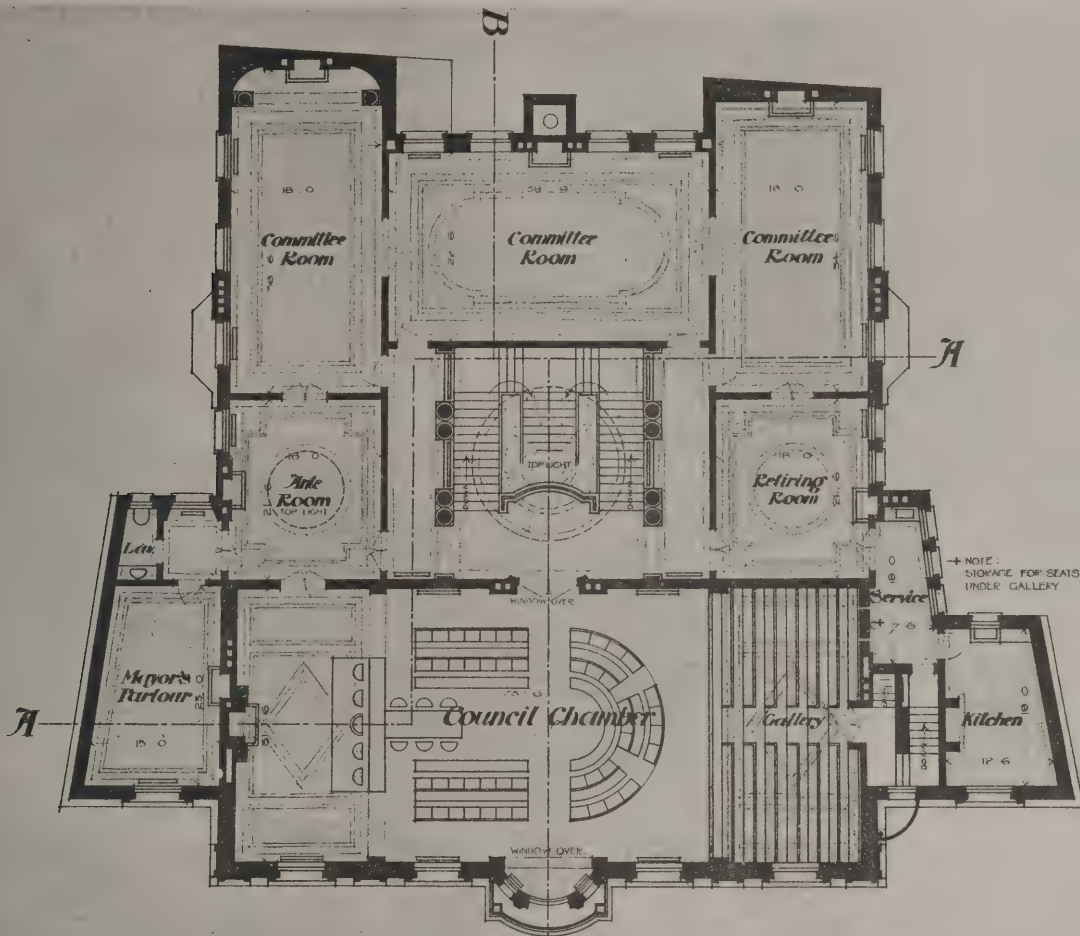


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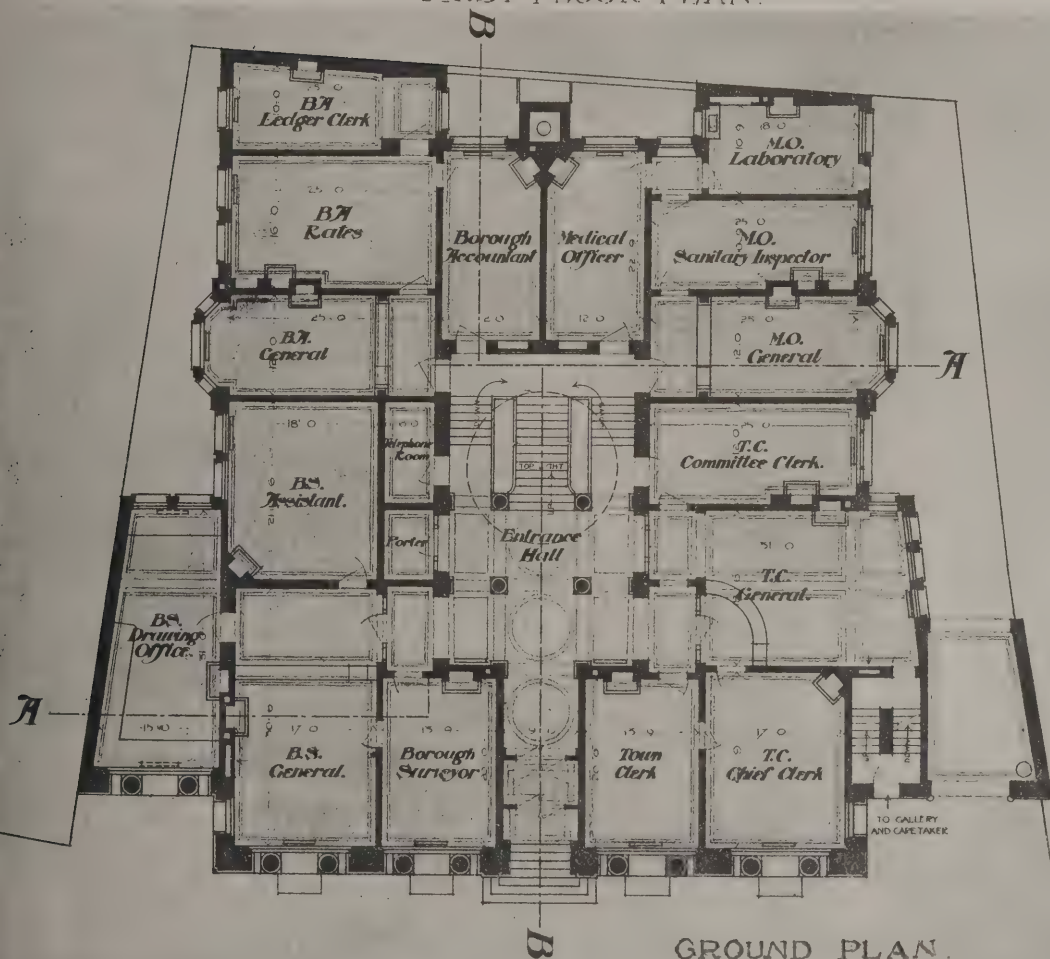
MUNICIPAL BUILDINGS, DEPTFORD: FIRST PREMIATED DESIGN.

By Messrs. LANCHESTER, STEWART & RICKARDS.





FIRST FLOOR PLAN.



GROUND PLAN.

SCALE OF 0 5 10 20 30 40 50 60 70 80 90 100 FEET

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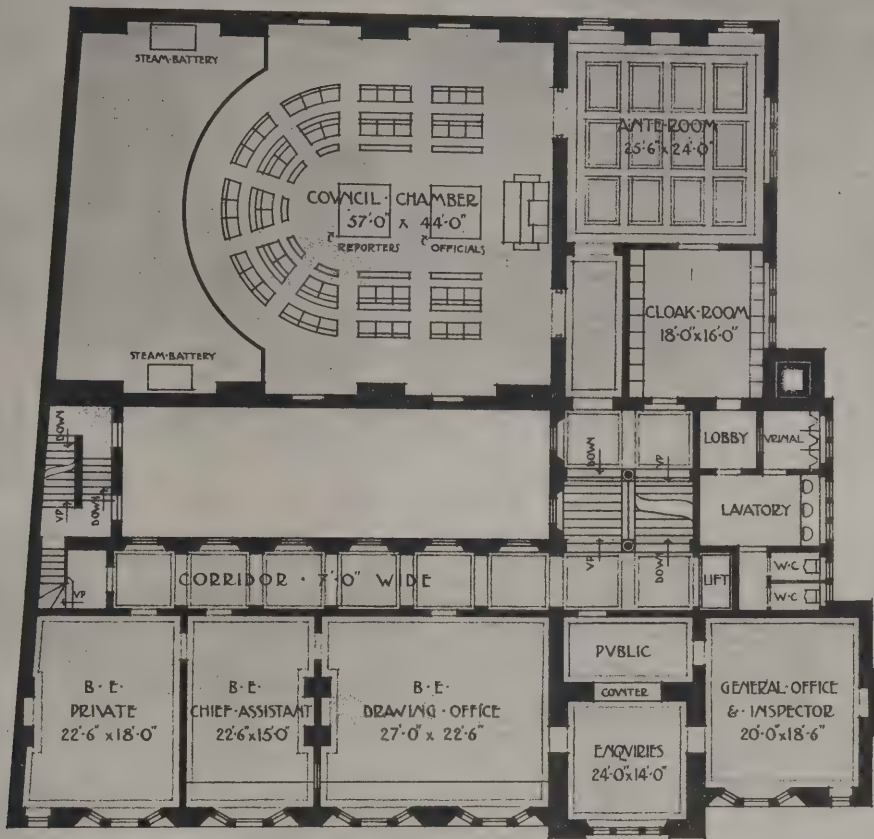
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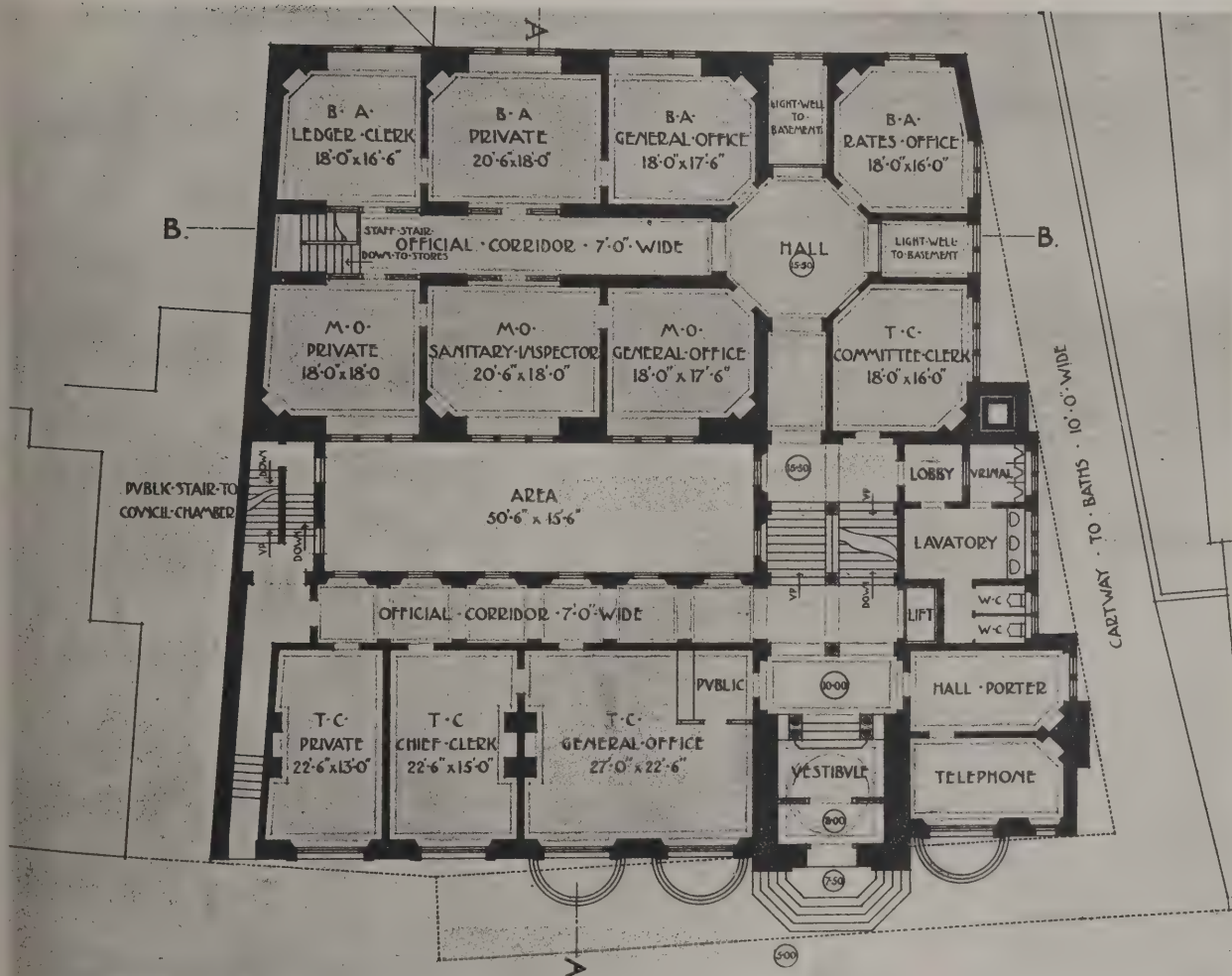




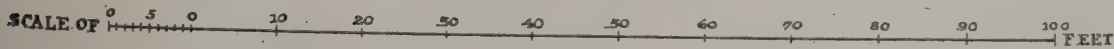




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GROUND PLAN.



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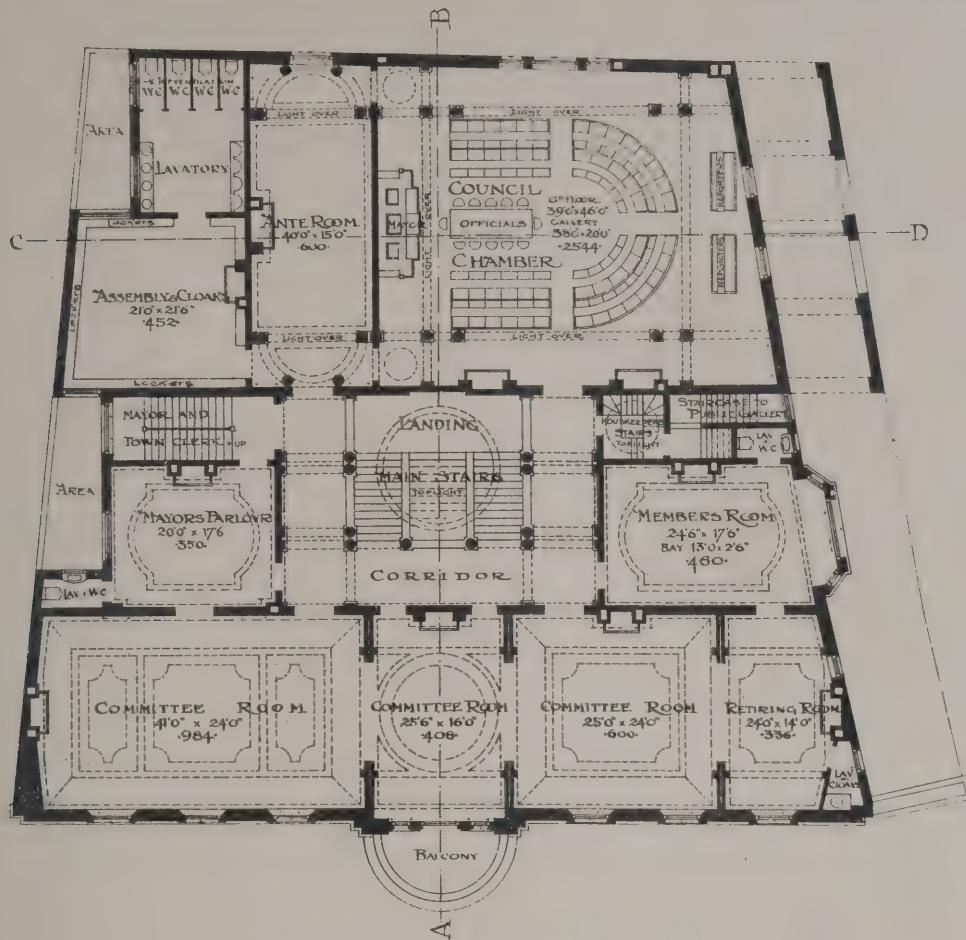
MUNICIPAL BUILDINGS, DEPTFORD: SECOND PREMIATED DESIGN.

By Messrs. S. B. RUSSELL & C. E. MALLOWS.

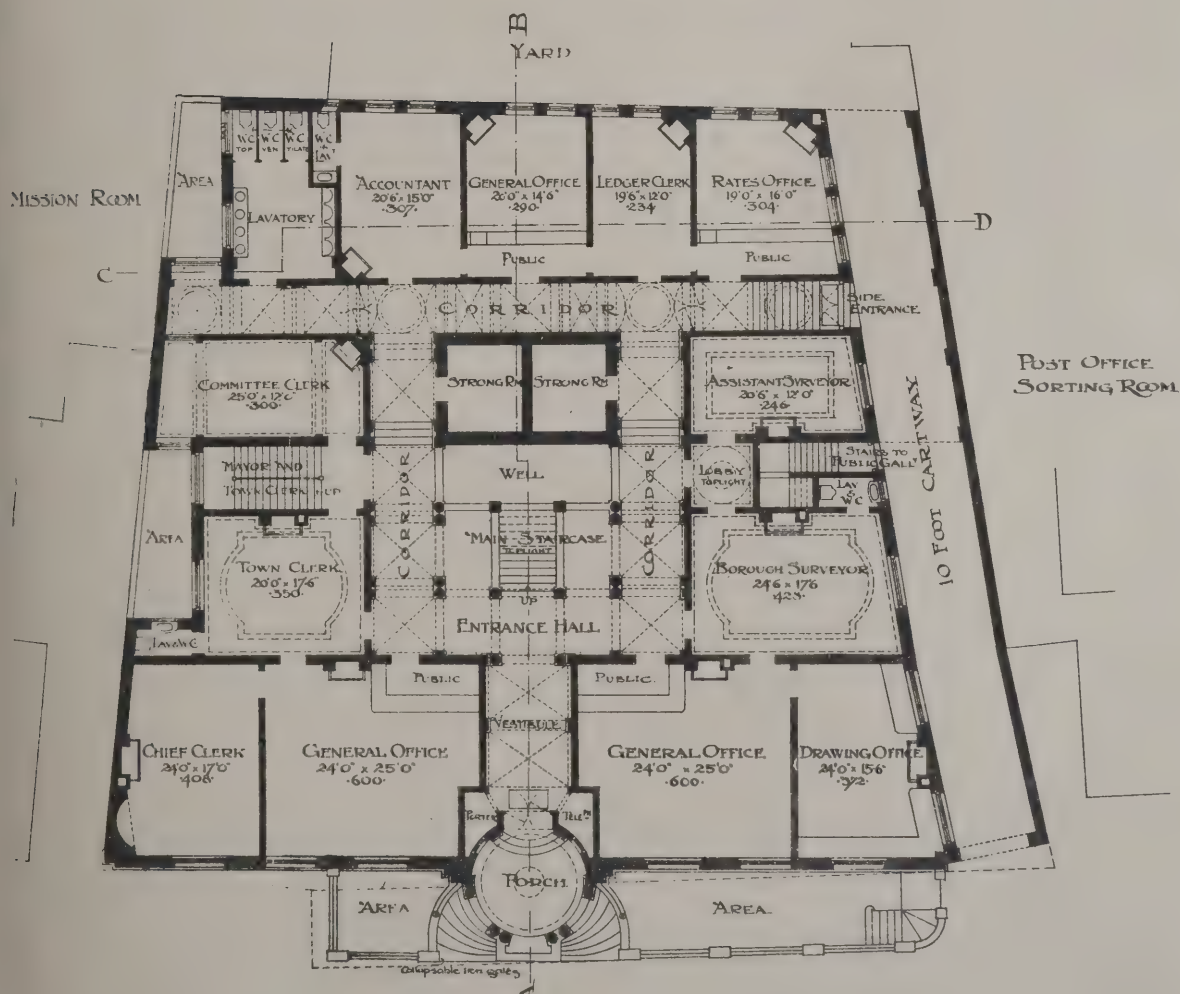








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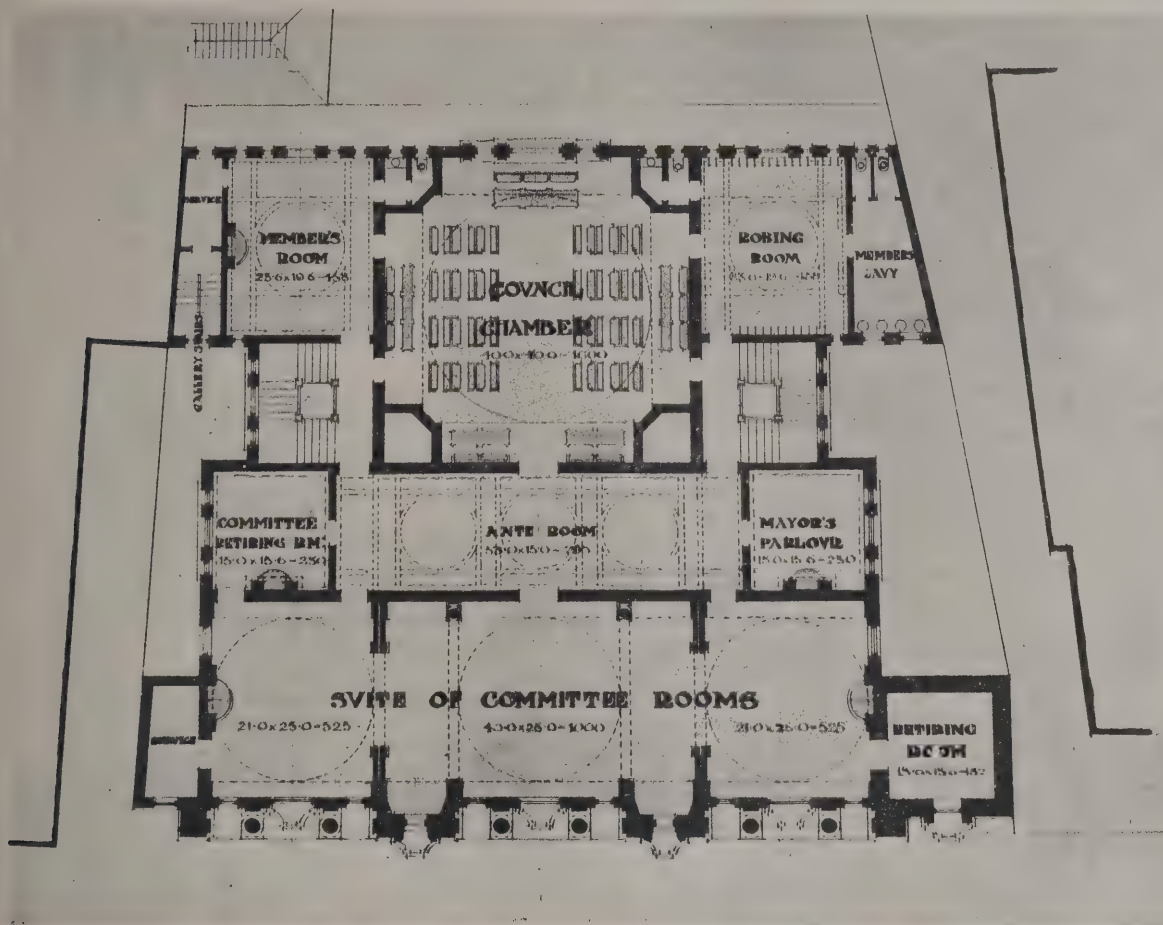
MUNICIPAL BUILDINGS, DEPTFORD: THIRD PREMIATED DESIGN.

By A. J. GALE.

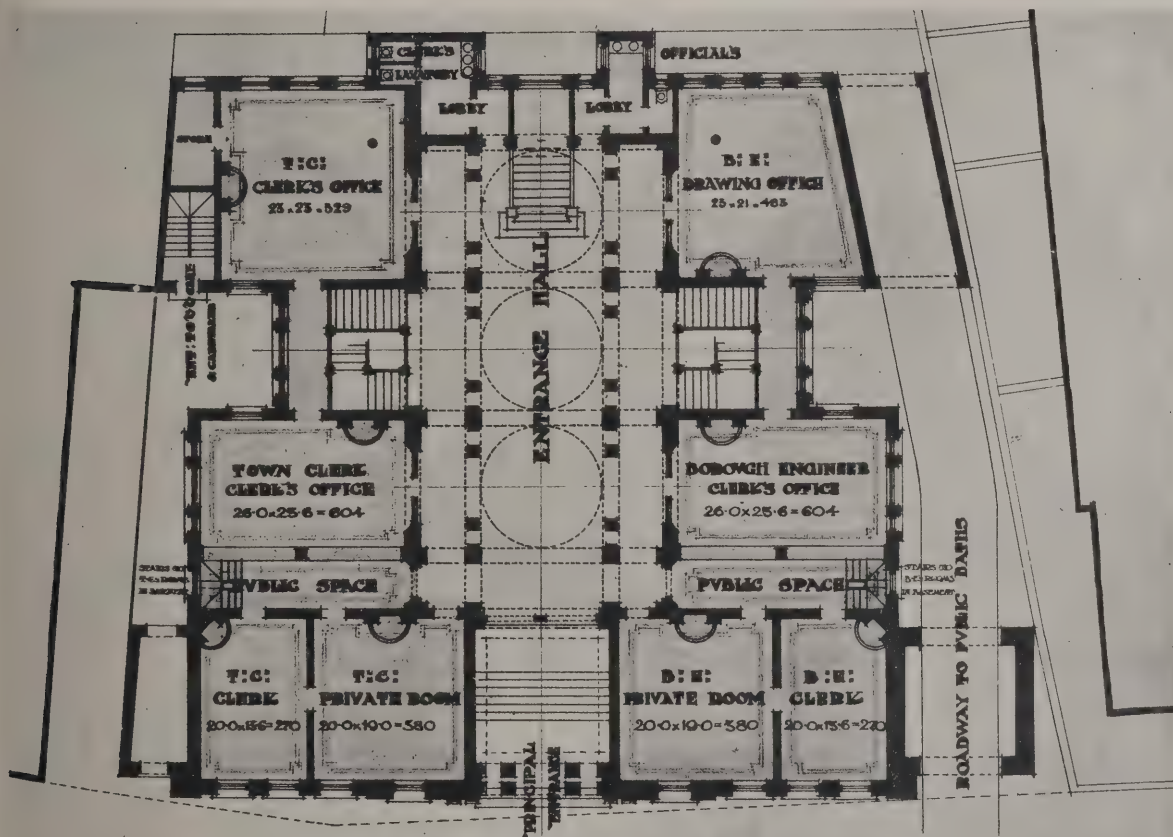








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GROUND FLOOR PLAN

SCALE OF 0 10 20 30 40 50 60 70 80 90 100 FEET

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MUNICIPAL BUILDINGS, DEPTFORD.

Design by A. BRUMWELL THOMAS.







THE

**Architect and Contract Reporter.****EDITORIAL NOTICES.**

*In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

**TENDERS, ETC.**

*\* As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

**COMPETITIONS OPEN.**

**ASHTON-IN-MAKERFIELD.**—Dec. 31.—Designs, &c., are invited for the enlargement of the Infectious Diseases Hospital. The architect whose plans are accepted and approved will be retained by the Council to carry out the work at the usual professional charges. Plan of the hospital site, together with full particulars of the alterations and extensions required, may be obtained from Mr. T. Burgess, surveyor, at the Council Offices.

**CAPE TOWN.**—Jan. 31.—The Council of the University of the Cape of Good Hope invite designs for the erection of university buildings. Premiums of 400*l.*, 200*l.* and 100*l.* will be awarded to the authors of the designs placed first, second and third respectively. Particulars of the competition may be obtained on application to the Registrar at Cape Town, or to the Agent-General in London.

**ECCLES.**—Dec. 12.—Plans are invited for the laying-out of an area of land and for erection of dwellings for the working-class on part of such area. Premiums of 50*l.*, 30*l.* and 15*l.* will be awarded in respect of the plans placed first, second and third in order of merit. Mr. Wm. Henry Hickson, town clerk, Town Hall, Eccles.

**DURBAN (NATAL).**—Dec. 18.—Designs are invited for new town hall, library, museum, art gallery and municipal offices. Three premiums of 500*l.*, 300*l.* and 200*l.* respectively will be awarded for the three best designs in order of merit. Mr. W. H. Radford, C.E., Albion Chambers, Nottingham.

**HOLYHEAD.**—Dec. 2.—Sketch designs are invited for schools and a teacher's house. The competitor whose designs and terms are approved and accepted by the Board will be appointed the architect. Mr. R. E. Pritchard, clerk, Holyhead.

**HULL.**—Jan. 31.—Designs in competition are invited for the extension of the town hall. Premiums of 300*l.*, 200*l.* and 100*l.* are offered. Mr. E. Laverack, town clerk, Town Hall, Hull.

**WAVERTREE.**—Plans are invited for erection of a church in Wavertree, Lancs, to cost 8,000*l.* Premium of 50*l.* offered for the selected design. Mr. E. Rogers, Crossley Buildings, South Castle Street, Liverpool.

**CONTRACTS OPEN.**

**BARNESLEY.**—Nov. 11.—For erection of outbuildings and conveniences at the Locke Park. Mr. J. Henry Taylor, borough surveyor, Manor House, Barnsley.

**BILSTON.**—Nov. 3.—For carrying-out the alterations and extensions of Lower Gornal Robert Street Infants' School, Coseley. Mr. A. Ramsell, architect, 187 Wolverhampton Street, Dudley.

**BIRMINGHAM.**—Nov. 15.—For erection of sanitary outbuildings at the old school block at the workhouse, Gravelly Hill. Mr. Cooper Whitwell, architect, 23 Temple Row, Birmingham.

**BISHOP AUCKLAND.**—Nov. 6.—For erection of an administrative block, main pavilion, isolation pavilion, porter's lodge and outbathing block, laundry and disinfecting block, covered ways, boundary walls and fences, water supply, drainage, roads, &c., at the No. 2 isolation hospital buildings at Helmington Row. Mr. William Perkins, architect, Victoria Street, Bishop Auckland.

**BOOTLE.**—Nov. 17.—For erection of cart-sheds, store-rooms and boundary wall at the refuse destructor, Pine Grove, Bootle, Lancs. Mr. J. Henry Farmer, town clerk.

**BRAINTREE.**—Nov. 15.—For erection of new master's quarters, &c, at the workhouse, Bocking, Braintree, Essex. Mr. Fred. Smoothy, clerk, 1 New Street, Braintree.

**BRIDLINGTON.**—Nov. 4.—For erection of a small villa residence. Mr. Samuel Dyer, architect, 29 Quay Road, Bridlington.

**BRIGHTON.**—Nov. 5.—For alterations to part of the Royal Pavilion in Palace Place to adapt the premises to the purposes of a telephone exchange, &c. Mr. Francis J. C. May, surveyor, Town Hall, Brighton.

**BROMSGROVE.**—Nov. 15.—For erection of the first portion of the proposed new lunatic asylum on the Barnsley Hall estate, near Bromsgrove, Worcestershire. Mr. George T. Hine, architect, 35 Parliament Street, Westminster.

**BURTON-ON-TRENT.**—Nov. 5.—For overhead equipment of the tramlines, &c. Messrs. Kincaid, Waller & Manville, 29 Great George Street, Westminster.

**COALVILLE.**—Nov. 4.—For supply and delivery of the pipes and specials required in the construction of new waterworks. Mr. J. B. Everard, 6 Millstone Lane, Leicester.

**COALVILLE.**—Nov. 4.—For supply and delivery of No. 192 sluice, air and reflux valves, No. 219 screw-down hydrants, No. 89 expansion joints, and No. 4 Deacon's waste-detecting meters, with other fittings, surface boxes, name plates and posts required in the construction of new waterworks. Mr. J. B. Everard, 6 Millstone Lane, Leicester.

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Fig. 5.



COALVILLE.—Nov. 4.—For construction of a service reservoir to hold 500,000 gallons, the laying and jointing of mains, fixing fittings and testing and other work required in the construction of new waterworks. Mr. J. B. Everard, 6 Millstone Lane, Leicester.

COALVILLE.—Nov. 4.—For erection at the proposed new pumping station of two compound inverted tandem pumping engines, each capable of lifting not less than 240,000 gallons of water in twelve hours, and two steel Lancashire boilers, 6 feet 6 inches diameter, 20 feet long, including steam and water pipe connections and fittings, foundation bolts, plates and girders, overhead traveller, &c. Mr. J. B. Everard, 6 Millstone Lane, Leicester.

CHATHAM.—For erection of a bookstall in the Royal Naval Barracks, Chatham. Particulars on application to the President of the Canteen, H.M.S. *Pembroke*.

CLAYTON.—Nov. 4.—For erection of a disinfecter-house at the workhouse, Clayton, Yorks. Mr. Sam Spencer, architect, &c, 344 Great Horton Road, Bradford.

DARTFORD.—Nov. 18.—For additions to the West Hill Boys' School, Dartford. Mr. Henry Hall, architect, 19 Doughty Street, W.C.

DARTFORD.—Nov. 19.—For erection of a home for female attendants at the Darenth Asylum, Dartford, Kent. Messrs. Newman & Newman, architects, 31 Tooley Street, S.E.

DARTMOUTH.—Nov. 3.—For construction of about 2,500 feet of 9-inch earthenware pipe sewers, with manholes, lamp-holes, road gully, pits, &c. Mr. A. Smith, borough engineer and surveyor, Dartmouth.

DERBY.—Nov. 17.—For alterations and additions to the Abbey Street higher-grade Board school. Mr. F. S. Antliff, architect, Draycott, Derby.

DIDCOT.—Dec. 1.—For alterations and additions to the Board school at Didcot. Messrs. Hoare & Wheeler, architects, 17 Friar Street, Reading.

GREENWICH.—Nov. 18.—For supply and delivery of one 50-ton electric power overhead travelling crane, with auxiliary 20-ton hoist, and for the erection of same at the London County Council's electricity generating station. All particulars at the County Hall, Spring Gardens, London, S.W.

GUILDFORD.—Nov. 3.—For supply of stoneware drain-pipes, Portland cement, brooms, brushes, &c. Mr. C. G. Mason, borough surveyor, Tunsgate.

HAMPTON.—Nov. 11.—For erection of 55 cottages at the Rosehill estate, Hampton, Middlesex. Mr. Edgar Cozens, clerk, R. D. C., Public Offices, Hampton, Middlesex.

HEATON.—Nov. 3.—For erection of a house and stable at Park Drive, Heaton, Yorks. Messrs. Adkin & Hill, architects, Prudential Buildings, Bradford.

HEBDEN BRIDGE.—Nov. 6.—For alterations, &c, to the Fox and Goose inn, Hebden Bridge, Yorks. Messrs. Joseph F. Walsh & Graham Nicholas, architects, Museum Chambers, Halifax.

HULL.—Nov. 19.—For alterations and additions, to the Hull Paragon Street passenger station, for the North-Eastern Railway Company. Mr. William Bell, architect, York.

IRELAND.—Nov. 5.—For erection of the Dufferin memorial parochial hall at Hamilton Road, Bangor. Messrs. Young & Mackenzie, Scottish Provident Buildings, Belfast.

IRELAND.—Nov. 6.—For erection of thirteen cottages, including out-offices, piers and gates, and for fencing nineteen plots at Kinsale. Mr. John Murphy, clerk, at the workhouse.

IRELAND.—Nov. 8.—For erection of a new drying-room and the supply of machinery for drying-room, including shafting, pulleys, belts, &c, to connect present engine with fan for drying apparatus; also steam connections, repairs to present drying-room, &c, at the district lunatic asylum, Ballinasloe. Mr. James Young, clerk of asylum.

IRELAND.—Nov. 8.—For erection of labourers' cottages, out-offices, piers and gates in the several divisions of the Fermoy district. Mr. P. O'Neill, clerk, R. D. C., Fermoy, Ireland.

IRELAND.—Nov. 17.—For erection of a new station building in timber at the Ballybeg station, for the Great Northern Railway Company (Ireland). Mr. T. Morrison, secretary, Amiens Street Terminus, Dublin.

IRELAND.—Nov. 21.—For erection of new buildings at Gransha for the committee of management of the Londonderry district lunatic asylum. Mr. M. A. Robinson, Richmond Street, Londonderry.

KETTERING.—Nov. 4.—For additions and alterations to the lodge at the isolation hospitals, Rockingham Road, Kettering, Messrs. Gotch & Saunders, architects, Bank Chambers, Kettering.

LEAVESDEN.—Nov. 5.—For erection of an isolation hospital at Leavesden Asylum, near Watford, Herts. Mr. T. Duncombe Mann, clerk, Metropolitan Asylums Board, Embankment, E.C.

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LEEDS.—Nov. 3.—For erection of large printing shed in Cardigan Lane. Messrs. Thomas Winn & Sons, architects, 92 Albion Street, Leeds.

LEWISHAM.—Nov. 4.—For construction of underground sanitary conveniences at Lee Green and Catford. Particulars can be obtained at the Surveyor's Office, Town Hall, Catford S.E.

LONDON.—Nov. 12.—For construction of two jetties and works at the wharf, 167 Grosvenor Road, S.W. Mr. John Hunt, town clerk, City Hall, Charing Cross Road, W.C.

LONDON.—Nov. 18.—For roadwork and platelaying required for the reconstruction on the conduit system for electric traction of the tramways:—(a) From the Elephant and Castle, *via* New and Old Kent Roads to East Greenwich; (b) from the Elephant and Castle, *via* Walworth Road, Camberwell Green, Church Street, Peckham Road and Queen's Road to New Cross Gate. Particulars from the Engineer's Department, London County Council, County Hall, (Spring Gardens, London, S.W., on payment of 10% returnable).

LONG EATON.—For erection of (A) six villas in two blocks, (B) twelve pairs of houses, (C) twelve pairs of houses, (D) sewerage and making of new roads at Long Eaton, Notts. Mr. Frank H. Collyer, architect, 8 Bridlesmith Gate, Nottingham.

MANCHESTER.—Nov. 10.—For construction of a boundary-wall and foundations for the high-level railway and coal bunkers at the Stuart Street generating station, Bradford, Manchester. Particulars may be obtained at the City Surveyor's Office, Town Hall, Manchester.

MIDDLESBROUGH.—Nov. 7.—For erection of a stable and cart-shed at the Albert Park. Mr. Frank Baker, borough engineer, Municipal Buildings, Middlesbrough.

MONTE VIDEO.—Dec. 15.—For the sanitary works to be carried out in Monte Video harbour. Works offered for tender include the following:—(a) A rock tunnel, 1,278 metres in length, 3m. 65 in height, and 3m in width; (b) a main collector, 1,557 metres 60 by 1,283m. 30 in length, oval profiles 80m. and 1m. 70 in height respectively; (c) a secondary collector 2,016m. in length, varying its oval profiles from 1'70m., m. 25, and om. 98 in height; (d) the auxiliary collectors, fluevents, &c. Plans, estimates and general conditions can be had in Monte Video by applying to the "Ministerio de Fomento," and through the respective Legations in Europe.

Tenders made in Europe through the Legations in the above-mentioned countries should be handed to the said Legations at least one month before the mentioned date. Plans, &c., may be seen at the offices of the Consulate-General of Uruguay, Edinburgh Mansions, Howick Place, Victoria Street, S.W.

NEWCASTLE-ON-TYNE.—For erection of business premises, showrooms and offices, &c., in Grey Street, Newcastle-on-Tyne. Mr. W. H. Knowles, architect, Grey Street, Newcastle-on-Tyne.

NEWCASTLE-ON-TYNE.—Nov. 6.—For supply and erection (complete) of a new triple-expansion direct-coupled engine of 3,000 horse-power at the power station, Newcastle-on-Tyne. Mr. A. E. Le Rossignol, general manager, Manors Powers Station.

NEW MALDEN.—Nov. 5.—For erection of three attached villas in Presburg Road, New Malden, Surrey. Mr. Vincent Davison, architect, 7 Market Place, New Malden.

NEWTON ABBOT.—Nov. 11.—For erection of a nurses home at the workhouse, Newton Abbot, Devon. Mr. Samuel Segar, architect, Union Street, Newton Abbot.

NOTTINGHAM.—For pulling-down and rebuilding shop in Clumber Street, Nottingham. Mr. Frank H. Collyer, architect, 8 Bridlesmith Gate.

OGBOURNE ST. GEORGE (WILTS).—Nov. 8.—For supply, delivery and erection of pumping plant at the waterworks. The Borough Surveyor, Town Hall, Swindon.

PRESTON.—Nov. 10.—For widening in stone of Standish county bridge, which carries the main road from Wigan to Chorley over the Bradley brook. Plans and particulars at the County Bridgeworks Office, Preston, Lancs.

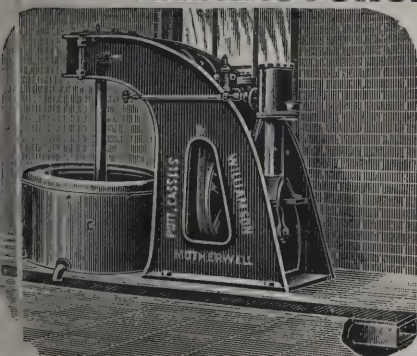
SCOTLAND.—Nov. 3.—For additions to home farm offices, Candacraig. Mr. Christie, factor, Estate Office, Strathdon.

SCOTLAND.—Nov. 4.—For additions and alterations to Glassel House, Aberdeen. Messrs. Jenkins & Marr, engineers and architects, 16 Bridge Street, Aberdeen.

SCOTLAND.—Nov. 6.—For erection of the administrative and infirmary blocks at Bangour, for the Edinburgh District Lunacy Board. Mr. Hippolyte J. Blanc, architect, 25 Rutland Square.

SCOTLAND.—Nov. 6.—For additions and alterations to (1) Kinlochlaggan Hotel and (2) gamekeeper's house at Cluny. Mr. Alexander Mackenzie, architect, County Buildings, Kingussie.

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SCOTLAND.—Nov. 8.—For erection of the combination infectious disease hospital at the east end of Old Rattray, Blairgowrie, and also for the erection of boundary walls. Messrs. L. & J. Falconer, architects, Blairgowrie.

SOUTHAMPTON.—For extension of car-sheds and other buildings at the Portswood tramway depôt. All information may be obtained at the Borough Engineer's Office.

STOCKPORT.—Nov. 8.—For an addition to the tramcar sheds at Mersey Square. Mr. John Atkinson, borough surveyor, St. Petersgate, Stockport.

STOCKPORT.—Nov. 4.—For repairs to the bridge at Norbury Hollow, Middlewood. Mr. G. Severn Doncaster, surveyor, Council Offices, Hazel Grove.

SUNDERLAND.—Nov. 28.—For supply of one steam-driven three-phase generator, motor generators and static transformers and high and low tension switchboards. Mr. J. F. C. Snell, electrical engineer, Town Hall, Sunderland.

TROWBRIDGE.—Nov. 5.—For completion of an existing cattle bay in the cattle market, and alterations to urinals at the town hall. Mr. H. G. Nicholson-Lailey, town surveyor, Town Hall.

WALES.—For erecting 11 houses in Old Box Yard, Llanelly. Messrs. J. Davies & Son, architects, Cowell House, Llanelly.

WALES.—For rebuilding business premises and offices at 6 and 7 St. John's Square, Cardiff. Mr. E. H. Bruton, architect, 119 Queen Street, Cardiff.

WALES.—For erection of two new shops in Cowell Street, Llanelly; alterations and additions to the Ashburnham hotel, Burry Port; extensions, &c., to house at Garnant, and ditto Glanamman; seven houses at Gilbert Road, Llanelly; new house, &c., near Derwydd station; new shop and premises at Brynamman. Mr. William Griffiths, architect, Falcon Chambers, Llanelly.

WALES.—Nov. 3.—For erection of a school, with master's house, boundary walls, roads, &c., at Aberbargoed. Messrs. James & Morgan, architects, Charles Street Chambers, Cardiff.

WALES.—Nov. 3.—For erection of classroom, cloak-rooms, boundary walls, &c., at Beaufort Hill Board school, Llangat-tock, Breconshire. Mr. Henry Waters, architect, Waengoch, Beaufort.

WALES.—Nov. 4.—For erection of a mixed and infants' school (to accommodate about 400) at Ystradgynlais. Mr. Philip Williams, Tyr Gorof, Ystradgynlais.

WALES.—Nov. 5.—For erection of a chapel, Cwmllynfell, Glamorgan. Rev. J. Rees, Cwmllynfell.

WALES.—Nov. 6.—For erection of fog signal house, &c., at Nash Point, Glamorgan. Mr. Chas. A. Kent, secretary, Trinity House, E.C.

WALES.—Nov. 6.—For alteration and extension of the timber landing-stage and sundry works on the pier structure, Llandudno. Mr. John J. Webster, 39 Victoria Street, Westminster.

WALES.—Nov. 8.—For erection of an office for the deputy county surveyor at the rear of the town hall, Bridgend, Glamorgan. Mr. T. Mansel Franken, clerk of the Council, Glamorgan County Offices, Westgate Street, Cardiff.

WALES.—Nov. 12.—For erection of four cash offices at the pier head, Harroby Street, Lincoln Street and Woodville Road East, Cardiff. Mr. W. Harpur, borough engineer, Town Hall, Cardiff.

WALES.—Nov. 26.—For erection of the Hafod school, Swansea. Mr. G. E. T. Laurence, architect, Chandos Chambers, Buckingham Street, Adelphi, W.C.

WALSALL.—Nov. 10.—For erection of cart-sheds, stables and other buildings, and alterations to existing buildings at Daw End, Rushall. Mr. Frederick W. Mager, district surveyor, Aldridge, Walsall.

WILLESDEN.—Nov. 11.—For erection of an assembly hall, laboratories, &c., at the Polytechnic, Priory Park Road. Mr. H. T. Wakelam, county architect, Middlesex Guildhall, Westminster.

YORK.—Nov. 5.—For erection of station buildings, platforms, stationmaster's house and four cottages at Horden Colliery, eight cottages at Blackhalls and eight cottages at Easington, for the North-Eastern Railway Company. Mr. William Bell, architect, Central Station, Newcastle-on-Tyne.

PROGRESS is being made in the scheme for erecting new premises for the Leysian Mission. The completed scheme will cost 110,000*l.*, but at present the outlay is to be limited to 100,000*l.*, the erection of the lesser hall and suite of vestries being deferred.

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W. Pearce	670	19	0
J. Meston	663	8	8
W. T. Merrin	637	6	6
Wheeler	606	3	0
Fry Bros.	596	3	10
Mowlem & Co.	570	0	0
WILSON, BORDER & Co., 1 Derby Gardens, Ilford (accepted)	563	15	7

### BRANDON.

For erection of a post office at Brandon, Suffolk. Mr. JAMES FARLEY, architect, Old Cross, Hertford.

J. H. & F. Mann	£1,578	10	0
Nash & Nash	1,576	0	5
J. Holmes	1,550	0	0
E. West	1,539	0	0
R. Dye	1,497	0	0
R. Shanks	1,450	0	0
G. Jackson	1,450	0	0
J. G. Cowell	1,446	0	0
G. W. Hawes	1,399	0	0
J. PARREN & SON, St. Ives (accepted)	1,251	0	0
S. Hipwell & Co.	1,150	0	0

### BRISTOL.

For erecting north aisle and vestry to parish church, Fishponds. Mr. E. H. LINGEN BARKER, architect.

Church	£2,061	0	0
Stephens & Bastow	1,943	0	0
Hayes	1,749	0	0
CLARK, Fishponds (accepted)	1,636	0	0
Walters	1,616	0	0

### HUNSTANTON.

For works at the Le Strange Arms hotel, Hunstanton, Norfolk.

F. Giddings	£7,639	0	0
Renaut Bros.	6,840	0	0
P. Banyard	6,691	0	0
Reuben Shanks	6,295	0	0
Youngs & Son	6,170	0	0
John Cracknell	6,095	0	0

### IRELAND.

For construction of a main sewer at Knocknagree, Millstreet.

J. J. HICKEY, Millstreet, co. Cork (accepted) . £145 0 0

### ILFORD.

For erection of Loxford Hall boys and girls' school. Mr. C. J. DAWSON, architect, 7 Bank Buildings, Ilford.

#### School buildings.

W. J. Maddison	£12,026	0	0
McCormick & Sons	11,781	0	0
S. Parmenter	11,662	0	0
A. Reed	11,400	0	0
Thomas & Edge	11,200	0	0
Kirk & Randall	11,146	0	0
Gregar & Son	11,096	0	0
H. J. Carter	10,923	0	0
J. Appleby	10,844	0	0
Hammond & Son	10,677	0	0
Lawrence, Walker & Son	10,644	0	0
G. Coffin & Son	10,603	0	0
F. WILLMOTT, Ilford (accepted)	10,375	0	0

#### Boundary walls, drains, &c.

W. J. Maddison	1,699	0	0
McCormick & Sons	1,674	0	0
A. Reed	1,600	0	0
Thomas & Edge	1,490	0	0
S. Parmenter	1,444	0	0
J. Appleby	1,440	0	0
Kirk & Randall	1,437	0	0
Gregar & Son	1,410	0	0
H. J. Carter	1,409	0	0
Lawrence, Walker & Son	1,350	0	0
Hammond & Son	1,318	0	0
G. Coffin & Son	1,240	0	0
F. Willmott	1,155	0	0

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**ILFORD—continued.**

For erection of a domestic economy centre. Mr. C. J. DAWSON, architect, Ilford.

F. Gowen . . . . .	£2,397	0	0
Wilson . . . . .	1,850	0	0
Hammond & Miles . . . . .	1,634	14	6
H. C. Horswill . . . . .	1,597	0	0
Thompson & Co. . . . .	1,573	10	0
S. Coffin & Son . . . . .	1,378	0	0
S. Parmenter . . . . .	1,375	0	0
J. Appleby . . . . .	1,367	0	0
S. & E. Moss . . . . .	1,340	10	0
Sims & Woods . . . . .	1,296	0	0
F. Willmott . . . . .	1,245	0	0
H. S. PORTER, Ilford (accepted) . . . . .	997	17	6

**IVYBRIDGE.**

For erection of a masonry wall at the isolation hospital at Lee Mill, near Ivybridge. Mr. F. A. CLARK, surveyor, New Town Chambers, Old Town Street, Plymouth.

Tozer . . . . .	£288	15	0
J. Allen . . . . .	267	0	0
R. T. Hortop . . . . .	198	11	0
W. E. Bennett . . . . .	179	10	0
Bennett Bros. . . . .	177	10	0
G. B. ANDREWS, Ivybridge (accepted) . . . . .	150	0	0

**JARROW-ON-TYNE.**

For erection of electric tramway offices and car-sheds in Beech Street.

T. LUMSDEN, Jarrow (accepted).

**KIRKHAM.**

For erection of a workhouse at Kirkham, Lancs.

S. WILSON, St. Annes-on-the-Sea (accepted). £43,997 0 0

**KING'S LYNN.**

For alterations and additions to Thurlow House, King's Lynn.

Renaut Bros. . . . .	£2,494	0	0
Robert Dye . . . . .	2,401	0	0
John Cracknell . . . . .	2,276	0	0
Reuben Shanks . . . . .	2,250	0	0

**LEEDS.**

For erection of a shed at Antwerp mills, Armley. Mr. C. S. NELSON, architect, Sun Buildings, 15 Park Row, Leeds.

Accepted tenders.

E. Wales, Armley, excavator, mason and brickwork.

J. Trickett & Son, Bramley, carpenter and joiner.

L. Cooper, Leeds, ironfounder.

J. Lindley, Leeds, plumber and glazier.

J. Atkinson & Son, Leeds, slater.

E. Greaves, Leeds, painter.

Total, £2,760 13s. 2d

**LONDON.**

For renovating South Bermondsey Club.

Whitehorn . . . . .	£96	0	0
Borkin . . . . .	85	10	0
Carter . . . . .	72	10	0
Bachelor & Sons . . . . .	62	10	0
Sergeant . . . . .	60	0	0
Keetch . . . . .	59	0	0
Thomas . . . . .	55	0	0
Withers . . . . .	55	0	0
Wick . . . . .	52	0	0
Hodge & Sons . . . . .	50	10	0
Seed Bros. . . . .	50	0	0
HAYDON, 49 Nursery Road, Brixton (accepted) . . . . .	44	17	0

**MARKET WEIGHTON.**

For erection of a police-station and court-house at Market Weighton, Yorks.

T. S. Ullathorne . . . . .	£2,649	0	0
W. Barnes . . . . .	2,572	0	0
G. Shutt . . . . .	2,461	19	0
G. Pape & Sons . . . . .	2,397	0	0
JOHN HUDSON, Market Weighton (accepted) . . . . .	2,375	12	0

**NOTTINGHAM.**

For painting the tramway poles on the Wilford Road section. Mr. ARTHUR BROWN, city engineer.

Allwood & Attewell . . . . .	£30	2	6
W. M. Tims . . . . .	28	18	0
G. H. Maddock . . . . .	28	17	0
Smeeton & Son . . . . .	27	17	0
W. READ, Bluecoat Street (accepted) . . . . .	26	10	0

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For construction of light railways, for the Middlesex County Council. Mr. H. F. WAKELAM, county engineer.

Railway No. 1.—Lordship Lane and Bruce Grove.

J. A. Dunmore	£52,946	19	0
R. C. Brebner & Co.	43,846	9	4
Kirk & Randall	37,830	5	4
A. Porter	37,311	13	4
W. L. Meredith & Co.	36,944	2	4
Binns	36,412	9	8
C. Wall	36,068	6	4
R. W. Blackwell & Co.	35,584	1	0
P. Smith	33,483	10	8
T. Adams	33,414	17	2
A. Kellett & Sons	32,982	6	4
E. Nuttall	32,326	6	8
J. A. Ewart	30,983	17	4
A. Faulkes	30,374	15	8
W. Manders	30,216	16	6
Dick, Kerr & Co.	28,498	18	6
W. Griffiths & Co., Ltd.	28,336	13	0
W. Griffiths & Co. Ltd.*	28,329	3	8
J. G. White & Co., Ltd.	28,232	1	0
Macartney, McElroy & Co.	31,754	8	2

Railway No 5 —Edgware Road.

R. C. Brebner & Co.	85,278	8	10
W. L. Meredith & Co.	72,339	6	8
Kirk & Randall	67,598	17	8
R. W. Blackwell & Co.	66,857	7	11
H. Morecroft	64,927	10	0
P. Smith	61,665	15	0
A. Kellett & Sons	60,431	14	4
E. Nuttall	59,990	3	4
C. Wall	59,992	0	10
Macartney, McElroy & Co.	58,184	8	7
J. Mowlem & Co.	57,965	4	1
J. A. Ewart	57,039	10	0
W. G. Wimpey	55,271	4	8
Dick, Kerr & Co.	50,367	6	6
W. Griffiths & Co., Ltd.	50,221	16	11
J. G. White & Co. Ltd.*	49,881	10	5
J. G. White & Co., Ltd.	49,537	5	5

\* Tenders recommended for acceptance. English rails to be supplied.

MIDDLESEX—continued.

Railway No. 3.—Archway Road and Great North Road.

R. C. Brebner & Co.	£86,740	17	4
W. L. Meredith & Co.	70,628	3	5
Kirk & Randall	67,658	17	2
R. W. Blackwell & Co.	63,298	19	2
P. Smith	61,403	5	8
C. Wall	61,337	13	10
E. Nuttall	59,886	18	6
A. Kellett & Sons	58,989	9	6
Macartney, McElroy & Co.	57,585	1	6
J. A. Ewart	56,580	12	8
A. Faulkes	54,964	12	5
Dick, Kerr & Co.	50,644	0	2
W. Griffiths & Co., Ltd.*	50,224	16	3
J. G. White & Co., Ltd.	50,022	3	1

\* Tender recommended for acceptance. English rails to be supplied.

NUNEATON.

For painting, colourwashing, whitewashing and sundry repairs to the workhouse.

Accepted tenders.

H. B. Shaw & Son, 27 Bishop Street, Coventry, plumber, &c	£114	0	0
Thomas & Matthews, Queen's Road, Nuneaton, plumber, &c.	90	12	0
G. Smith, Chilvers Coton, builder, &c.	84	15	0
A. Rowley, Nuneaton, plumber, &c.	81	0	0
A. Brown, West Bridge Square, Leicester, painter	75	10	0
W. Wright, 36 Edward Street, Nuneaton, builder, &c.	74	0	0

OTTERY ST. MARY.

For alterations and additions to The Grove, Holcombe, Devon. Mr. EDWARD GEO. WARREN, architect, Commercial Chambers, Exeter. F. Williams, Ottery St. Mary, buildings. Garton & King, Exeter, heating and plumbing. No competition.

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## PLYMOUTH.

For erection of artisans' dwellings (block No. 4), fronting Looe Street. Mr. JAMES PATON, borough surveyor.

J. P. Berry	£7,838	0	0
J. Endean	7,584	0	0
W. E. Blake	7,456	0	0
Pearce Bros.	7,212	0	0
A. R. Lethbridge & Son	6,935	0	0
A. Andrews	6,925	0	0
A. N. Coles	6,819	0	0
J. Cockerell	6,799	0	0
Wakeham Bros.	6,779	0	0
T. May	6,755	0	0
S. ROBERTS, Plymouth (accepted)	6,366	0	0

## PURLEY.

For erection of a house at Purley, Surrey. Mr. F. OWEN MOORE, architect, 12 Cornford Grove, Balham, S.W.

W. Manning	£1,698	0	0
W. Roberts	1,397	0	0
J. Robinson	1,234	0	0
W. Walker	1,205	0	10
W. Smith & Son	1,189	0	0
J. Westbrooke	1,140	0	0
E. Smart & Son	1,124	10	6
W. H. Baldwin	1,118	15	0
A. G. Wright	1,110	13	5
W. H. Chapman & Son	1,096	0	0
W. Hine	1,071	1	6
E. Goulder (exors. of)	1,070	0	0
J. S. Simmons & Co.	1,050	0	0
GATHERCOLE BROS, London Road, Norbury (accepted)	1,029	0	0

## REIGATE.

For extension to business premises, 74 Lesbourne Road, Reigate. Mr. C. E. SALMON, architect, Bell Street, Reigate.

T. Bushby & Son	£159	0	0
Bagaley & Sons	155	0	0
Nightingale & Sons	136	0	0
G. MARTIN, Redhill (accepted)	117	0	0

## SOUTHEND-ON-SEA.

For erection of viaduct.

W. A. Baker & Co., Ltd.	£9,250	0	0
Head, Wrightson & Co., Ltd.	7,691	13	7
G. Thompson & Co.	7,307	0	0
Jones's Ironfoundries and Engineering Co., Ltd.	6,999	0	0
Mayoh & Haley	6,400	0	0
A. Fasey & Son	6,300	0	0
Clayton, Son & Co., Ltd.	6,280	0	0
S. Cutler & Sons	6,261	10	0
Jukes, Coulson, Stokes & Co.	6,099	0	0

## STEPNEY.

For construction of a well and sump pit at the electricity supply station. Mr. W. JAMESON, borough engineer.

T & W. Cole, Ltd.	£525	0	0
Carlton Ironfoundry Co.	399	18	0
E. & F. Wright	325	0	0
W. GRIFFITHS & CO., LTD. (accepted)	280	0	0

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For supply of one complete lighting switchboard, with all instruments and accessories.

B. THOMAS, Cornbrook Telegraph Works, Worsley Street, Hulme, Manchester (accepted) £929 10 0

For a complete installation of the electric light and wiring to the motors on the electricity works, and for the supply and delivery of testing instruments and engine-room accessories.

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## Motor wiring, &amp;c.

R. J. Nicholson & Co. £232 6 6

## Testing instruments, &amp;c.

Thomas-Houston Company III 7 6

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For erection of a mortuary at the back of Avon.

J. Howell £80 0 0

## TORPOINT.

For construction of a sewer at the back of Gawen Terrace, Torpoint, Devon.

W. E. BENNETT, 44 South View Terrace, Plymouth (accepted) £84 10 0

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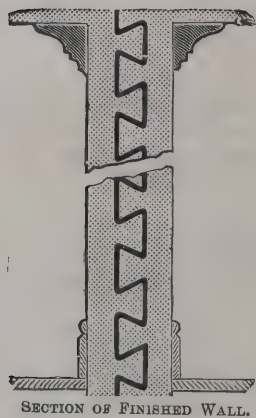
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Watson, Gow & Co. . . . .	£281	15	0
Stanton Iron Co. . . . .	278	17	6
D. Y. Stewart & Co. . . . .	278	17	0
Cochrane & Co. . . . .	261	7	6
Needham & Son . . . . .	259	17	6
D. M. Stevenson & Co. . . . .	246	0	0
J. & R. Ritchie . . . . .	243	12	6
Abbot & Co. . . . .	236	10	0
A. G. Cloake . . . . .	221	3	0
BIRTLEY IRON CO, Durham (accepted) . . . . .	235	10	6

**TOTTENHAM.**

For street works as follows.

*Accepted tenders.*

Grounds & Newton, Page Green, South Tottenham, Crowland Road £614 18s. 3d., Ferndale Road £600 10s. 6d.; W. Guyatt, Kingscliffe Villas, Mount Pleasant Road, Tottenham, Nelson Road (No. 1) £174 11s. 6d., (No. 2) £219 19s. 3d., Collingwood Road £339 11s., Shelbourne Road £2,133 2s., Chester Road £826 19s. 1d., Belton Road £326; E. Frost, Steele Road, Tottenham, Eve Road £276 17s. 10d.

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For sewerage works in Tantarra Street.

G. TRENTHAM, Handsworth (accepted) . . . £240 0 0

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For supply of broken Guernsey or Quenast granite, delivered free at Ware station at the Great Eastern Railway.

C. M. MANUELLE, 120-123 Fenchurch Street, London, 1½-inch and 1½-inch 13s. 6d. per ton, 2-inch 13s. 3d., ½-inch screenings 12s. 4d. (accepted).

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For metal rotary washing-machine, hydro-extractors, &c., at Union schools and workhouse, Leyton, for the West Ham Board of Guardians, West Ham. Mr. JOHN BULEY, engineer, Laurence Pountney Hill, E.C.

CHERRY TREE MACHINE CO, LTD. (accepted).

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**A.**

Willmott & Sons . . . . .	£9,756	0	0	+	£25	0	0
C. Cox . . . . .	9,683	0	0	+	72	0	0
F. & F. J. Wood . . . . .	9,542	0	0	+	64	0	0
Killby & Gayford . . . . .	9,380	0	0	+	65	0	0
Perry & Co. . . . .	9,348	0	0	+	58	0	0
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**TRADE NOTES.**

IN view of the importance of technical education, Messrs. Andrew Handyside & Co., Ltd., of Derby and London, makers of steel bridges, roofs, buildings and structures, have just made arrangements for a number of their apprentices to attend evening classes in prescribed subjects at the Derby technical college, and in order to encourage them are paying half the



case in point is that of the witty comedy, "The Marriage of Kitty," which, after a long and successful run at the Duke of York's, has been transferred, with every sign of further success, to Wyndham's Theatre. Here the scenes are well contrasted: a lawyer's office—substantial, sober, comfortable and businesslike, and a salon in the house of Lady Belsize on the Lake of Geneva, of which the sketch conveys a good idea. The dainty furniture and draperies in this play were supplied by Messrs. Oetzmann & Co, of Hampstead Road, W.

fees and purchasing the necessary instruments and books for each apprentice for a term of three years. Apprentices who pass the prescribed examinations will receive increased wages, and be allowed to retain the instruments purchased for them.

THE tenth edition has just appeared of the useful little brochure which, under the title of "American Crop Movements," is issued by the London and Lancashire Fire Insurance Company. In this edition they have remodelled several of the tables in order to bring them quite up to date. For instance,

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## ILLUSTRATIONS.

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DESIGN by Mr. A. BRUMWELL THOMAS.

Tables 3, 4 and 5 are now on the basis of the New Orleans Cotton Exchange figures, instead of following those of the *New York Financial Chronicle*, as hitherto; they have introduced the new metric system into their calculations to meet the present trading basis; and Table 18, dealing with the cost at carding engine head, has been converted into decimals as being more useful to the spinner. The tables deal with the cotton crop in its various phases, and as the company have received the best practical advice in their compilation, they cannot fail to be of material assistance to all in any way connected with the cotton business.

WE have received from Messrs. G. M. Restall & Son, of Soho Pool Wharf, Birmingham, a pamphlet descriptive of their new patent Coronation wood lathing, angle staves, &c. This lathing is intended for walls, ceilings and other purposes, and varies from 1½ inch to 3 inches in width, with an average thickness of ¾ inch. It can be supplied in almost any lengths up to 15 feet. It is dovetail grooved and V-edged, and if the pieces be kept about 3-16 inch apart from one another they will form such a key that it will be impossible for any ceilings to give way or crack, and if two wire nails are fastened in each joist the laths will not warp. The advantages claimed for this patent wood lathing are as follows:—Ceilings can be pricked up before the floors are laid down, and if necessary can be skimmed, as owing to the solidity of the laths, the nailing down of floor-boards will not disturb such ceiling. One inch in thickness of dry sand, mixed with any disinfectant or any insecticide, and laid on the top of the ceiling, will have a good sanitary result, as well as making the ceiling fireproof, and if Restall's fireproof quick-setting adamant plaster is used in the plastering, such ceiling will be (as far as it is possible), "fireproof," and will be cheaper than metal lathing. The patentees do not consider metal lathing fireproof, as it soon gets red hot, and helps to set fire to the joists and other timber. Ceiling joists or studding can be kept 2 feet or more apart, thus saving time and timber. The lathing being wide

and in good lengths, saves time in fixing. It also takes considerably less plaster than if ordinary lathing were used.

## VARIETIES.

AT Grays, in Essex, a working men's club is about to be erected. Mr. M. Shiner, of 8 Crutched Friars, E.C., is the architect.

A NEW Wesleyan lecture-hall and classrooms, costing 2,500l., has been opened at Barton-on-Humber. There is 1,210l. to raise.

ABINGDON school has been extensively enlarged; and the new buildings were opened by the Lord-Lieutenant of Berkshire on the 22nd inst.

THE King has granted permission to Mr. Edwin O. Sachs, chairman of the British Fire Prevention Committee, to wear the decoration of the Red Cross recently conferred upon him by the German Emperor.

THE new dry dock of the Tredegar Dry Dock and Wharf Company was opened on the 25th inst., when the Mayor of Newport (Mon), laid a memorial-stone recording the event. The new dock, which is built to accommodate the largest cargo steamers afloat, is 708 feet long and 65 feet wide, and by the use of intermediate gates can be converted into two docks, one 358 feet long and the other 348 feet.

THE new public dispensary erected adjacent to the Royal Alexandra infirmary, Paisley, was formally inaugurated on the 24th inst. The building, which has been erected as a memorial of the late Queen's diamond jubilee, is a commodious structure, so arranged internally that visitors enter at one end, presenting their tickets at an office, then pass into a waiting hall. From here in turn they go into the doctors' consulting rooms at the other end, get their advice and prescriptions, pass on to the dispensing department and thence out by another doorway.

THE parish church of Llanllwchaearn has now been reopened. The renovation was associated with the Coronation of His Majesty the King, and was carried out under the personal direction of Mr. E. Parke, architect, of the same place. The chancel has been lined with old oak panelling and an old oak altar and reredos have been erected to commemorate the reign of Queen Victoria. The reredos consists of a fine piece of carved moulding, after a design by Pugin which surmounts seven panels of Gothic tracery, which belonged

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formerly to Welshpool Church. The altar is ornamented with seven similar panels of tracery.

THE foundation-stones of the new Baptist schools, Grove Road, Lowestoft, were laid on October 23. The schools, which are being erected on a site at the back of the existing church and vestries, include large schoolroom, church parlour, infants' room, kitchen, six independent classrooms and three other classrooms, capable of being thrown open into schoolroom by means of swivel partitions. Suitable lavatory accommodation is provided. The building is faced externally with red brick, the dressings being of white Costessey work. The design is of Late Gothic. The contract is let to Mr. Charles E. Earl, and amounts to 1,338*l*. The architects for the above new buildings and for the church (recently completed) are Messrs. G. & R. P. Baines, 5 Clement's Inn, Strand, London, W.C.

THE directors of John Brown & Co., Atlas Works, Sheffield, and Clydebank, Glasgow, announce that an agreement has been made for an amalgamation of interests with the well-known steel manufacturers, Thomas Firth & Sons, Ltd., of Sheffield. Under the agreement seven-eighths of the Ordinary shares of Firth & Sons have been acquired by John Brown & Co. in consideration of the transfer to the shareholders of the former company of 90,000 Ordinary shares of 1*l*. each fully paid and 24,000 Preference shares of 10*l*. each fully paid of the latter company. The directors of John Brown & Co. state that, having regard to the profits made by Firth & Sons, the acquisition of this large interest in the business of that firm will be beneficial to the shareholders of their own company.

COLONEL W. R. SLACKE, inspector of the Local Government Board, conducted an inquiry at the town hall, Stratford-on-Avon, on Tuesday, with reference to an application by the Town Council for permission to borrow 9,232*l*. for the purpose of effecting certain extensions and improvements at the gas-works. The town clerk explained that the gas undertaking was purchased by the Corporation in 1880. The works were continually growing, and large sums had been spent upon them from time to time. It was necessary now that new purifiers should be laid down, together with new feeding mains, and that other works should be carried out. As showing the increased consumption of gas, it was stated that in 1881 the consumption stood at about 28,000,000 cubic feet, whereas it was now considerably over 55,000,000. The inspector took formal evidence and examined the plans, and afterwards, accompanied by the chairman and the gas manager, paid a lengthened visit to the works.

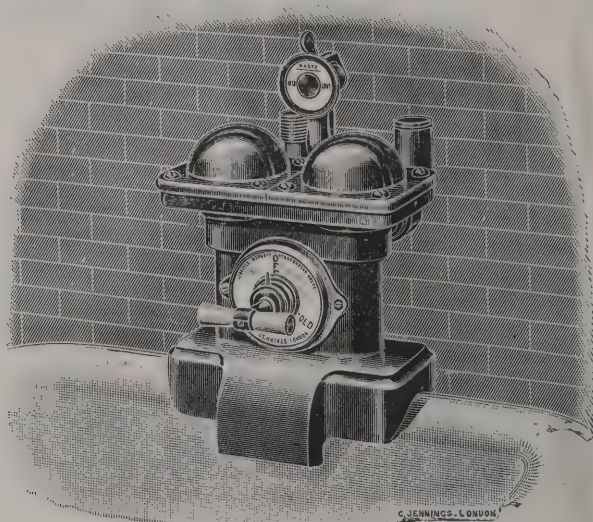
THE Roman Catholic church of St. Patrick, in Trim, Ireland, is now completed. It is a fine building in the Early Decorated Gothic style, and comprises sanctuary, nave, transepts, side aisles, side chapels, nuns' choir and two sacristies, and heating chamber. The total length of the interior of the church is 137 feet 8 inches, and the width across transepts 77 feet, height from floor to ceiling 50 feet, length of nave 106 feet, and width 30 feet; width across nave and aisles 60 feet. The principal entrance to the church is through the tower porch. The tower itself, which is 25 feet square, rises to a height of 100 feet, with octagonal pinnacles at angles, surmounted by a spire 90 feet high. The total height of the spire from the ground to the top of the cross is 208 feet. The interior of the church is beautifully decorated, and the high altar, fashioned from Sicilian marble, is a beautiful work of art. The building was designed by the late Mr. W. Hague, architect, Dawson Street, and after his death the work was entrusted to Mr. W. H. Byrne, F.R.I.A., Suffolk Street. Mr. Patrick Nolan, Monaghan, was the builder.

THE new Roman Catholic church at Selly Oak, Birmingham, is now open for public worship. It is dedicated to St. Edward, and is situated at the junction of Bournbrook and Elmdon Roads. The new building, the architect of which is Mr. H. T. Sandy, provides seating accommodation for about 500, and when fully completed will consist of a nave 82 feet long and 30 feet wide, two aisles equal in length to the nave, and an apsidal-ended chancel. At the east ends of the north and south aisles respectively will be the lady and Sacred Heart chapels, and at the west end of the nave a spacious vestibule, over which will be the choir and gallery. At the west end of the north aisle it is intended to build a tower, surmounted by a spire. The sides of the apse each contain a lofty, three-light traceried window, and the west gable is filled with an elaborate traceried window. The design of the church is in the Early Decorated style of English Gothic, and the building, which has been erected by Mr. W. Bishop, is mainly of brick with Bath stone dressings and faced externally with plaster.

THE lending department and news and periodical-rooms of the new free library at Leamington are now open to the public. The library, which has hitherto been housed in the town hall, is now accommodated under the same roof as the Municipal Technical Institute, and the joint buildings have been erected at a cost of 16,000*l*. The style adopted by the architect, Mr. H. Bottomley, of Leeds and Middlesbrough, is a free treatment

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of the Renaissance, but the chief object in view has been to provide a commodious and substantial building rather than one with pretensions to architectural beauty. The accommodation provided for the library is particularly good, comprising a spacious newspaper reading-room, a comfortable periodical-room, and a well-equipped reference library. The arrangements for the lending library have been completely remodelled, and the indicator system has now, for the first time in Leamington, been adopted.

KIRKLINTON CHURCH, Cumberland, has now been reopened after having undergone interior renovation and decoration which have made it a very handsome place of worship. A new oak ceiling has been put in, new oak seats in both nave and chancel have been provided, a new pulpit has been erected, new floors have been laid down, a new heating apparatus has been introduced and the whole of the walls have been painted and decorated. The ceiling is provided with arched principals to encase the old ones and moulded purlins. The principals rest upon stone-carved corbels, the subjects of the carving being sacred emblems and monograms. The chancel seats have open traceried fronts, and are enclosed with a dwarf and carved screen resting upon a solid Devonshire marble plinth 8 feet long. On the screen is the carved motto, "Laudate Dominum, quia bonus Dominus; psallite nomini ejus, quoniam suave." The pulpit is panelled and traceried, and rests upon a plinth also of Devonshire marble. The space between the choir stalls is paved with marble and the altar step is of the same material. The nave seats are handsome and comfortable, those in the front being open and traceried. The walls of the nave are panelled round with oak, and the passages are laid with oak blocks. The total cost of the work has been about 1,100/. Mr. J. H. Martindale, of Carlisle, was the architect.

TRINITY CHURCH, Leeds, the new Congregational church which is being erected in Woodhouse Lane, is now nearing completion. Erected from designs by Messrs. Danby & Simpson, Trinity Congregational church is in the Perpendicular Gothic style, and this form of architecture is carried throughout a complete equipment of buildings, there being in addition to the church a large lecture-hall, vestries, classrooms and caretaker's house. The church consists of nave, aisles, transepts, chancel, and a tower and spire rising to 130 feet. The main entrance is approached by a flight of stairs leading to an outer vestibule, at what would be the west front were the building

oriented in the usual ecclesiastical style. As a matter of fact, it is south-east. Above is a nobly proportioned seven-light window, and there is a corresponding window at the chancel end. The latter is filled in with stained glass, and this is the case also with one of the series of two-light windows in what for convenience may be described as the south aisle. The pulpit is at the corner of the southern transept, and is of carved oak resting on a pediment of Caen stone, relieved with alabaster pillars. The fittings in the chancel, the choir stalls and the organ-case are also in carved oak, treated in keeping with the architecture of the building. The organ, by the way, is a reconstruction of the very fine instrument that formed a notable feature over the pulpit in East Parade chapel. Here it is placed on the northerly side of the chancel. The pews are of pitch pine, and give accommodation for over 800 worshippers. There are no galleries. Altogether the interior is as chaste and effective as the exterior is picturesque. The price paid for the site exceeded 8,000/., and a sum of about 15,000/. will, by the time all the contracts are settled, have been spent on the buildings.

THE new Pump Street Wesleyan church and schools were opened in Worcester on the 22nd, the occasion being one of rejoicing. The architecture of the church is of the late Gothic period, and the building, which will accommodate some 850 people, is cruciform in plan, having a chancel and two transepts. The entrance of the old church was by a narrow passage running parallel with High Street, but the new building is entered from Pump Street. A tower at the north-east corner gives the building a somewhat imposing appearance. A handsome vestibule on either side of the main entrance admits one to the body of the church, while there are separate entrances to the gallery. The interior is noticeable for an entire absence of that gloom which was so depressing a feature in the old place of worship. There are numerous windows, which are glazed throughout with cathedral lead lights of an artistic character. Side and roof ventilators provide for adequate ventilation, and the seating arrangements strike one as being convenient and comfortable. The pews, which are of the best selected pitch pine, are modern in shape. The body of the chapel is not overshadowed by the gallery, but there is about each an appearance of breadth and spaciousness. The choir seats are situated on either side of the pulpit, at the back of which is a roomy space for the communion table. The pulpit itself is of carved oak and set

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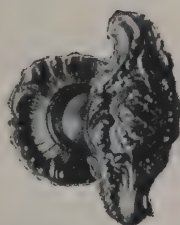
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on a stone base. To the left of the pulpit is an entrance to the preacher's vestry—a compact apartment—and on the right a vacant space is reserved for the organ. The new school premises consist of a large schoolroom 59 feet 6 inches by 36 feet 9 inches, four classrooms and infants' school, while on the first-floor there is a spacious church parlour with convenient cloak-room accommodation and lavatories adjoining. Each room is well lighted and ventilated, and the large schoolroom has four skylights. The church parlour is a very well-appointed room, with walls coloured in a pleasing shade. Electric light is installed throughout the buildings, which are heated by water apparatus. The designs of the church and schools were prepared by Mr. J. J. Green, architect, Adelphi Bank Chambers, Liverpool, and Mr. Wm. Hopkins, of Birmingham, is the contractor.

### ELECTRIC NOTES.

A LOCAL GOVERNMENT BOARD inquiry was held at the Guildhall, Nottingham, on the 21st inst., by Colonel A. J. Hepper, D.S.O., R.E., into an application by the City Council for sanction to borrow 35,500*l.* for purposes of electric lighting. Those present were Sir Samuel Johnson (town clerk), Messrs. F. B. Harris (assistant solicitor), H. Talbot (city electrical engineer), A. Brown (city engineer), T. W. Gordon (assistant engineer), J. E. Bryan (city accountant) and F. W. Fox (assistant accountant). The city accountant first informed the inspector that the assessable value of Nottingham was now 940,217*l.*, the outstanding loans under the Sanitary and Public Health Acts 1,113,463*l.*, and the population about 240,000. The town clerk explained that the application was to borrow two sums of 15,500*l.* and 20,000*l.*, which had been authorised by the City Council, for electricity purposes. The first was for a station at the Eastcroft, where the Corporation were now adopting new destructors. An understanding had been arrived at by the electricity and health committees by which certain things should be provided in the erection of the destructors so as to be available for generating electricity. The necessary power and steam would be taken from these boilers, and in order to accomplish that, it was necessary to spend 15,500*l.* at the Eastcroft. The site, added Sir Samuel, in reply to a question by the inspector, was their own freehold property, being one of the ancient estates of the Corporation, and speaking from recollection he believed it dated from the reign of

Henry VII. The other portion of the land was for the extension and laying of mains, as they might be required. Mr. Talbot said that there were now 2,060 consumers, including power and light. The 10,000*l.* which was borrowed in the early part of this year had already been spent in the laying of the mains, &c. The inspector afterwards went to look at the site.

THE town of Dorking is to be lighted by electricity. About an acre of ground has been acquired from Lord Ashcombe in Station Road in close proximity to the swimming-bath and the gasworks, on terms which the Urban Council regard as very reasonable. A road is to be formed from Station Road up to the buildings, which will occupy a most convenient situation, being within easy reach of the railway station for the cartage of coals, the chief requisite, and also near the Pippbrook stream where there is an ample supply of water. On the site will be placed an engine-house, boiler-house, accumulator-room, stores, showroom, workshop, &c., and a glance at the elevations at once dispels any fear of the buildings constituting anything approaching an eyesore, whilst they will provide all that will be required for such works and leave room for future possible extensions. Mains will at once be laid in Station Road, the whole of High Street, West Street, Junction Road, South Street, Horsham Road, Falkland Road, Harrow Road, Knoll Road, Rosehill, and along the London Road as far as the Star and Garter Hotel. Application has been made by the Council for sanction to borrow the sum of 20,000*l.* for the undertaking, and in due course a Local Government Board inquiry will be held.

### BUILDING AND BUILDERS.

THE foundation-stone of a new Victoria Hall was laid at the village of Kemerton, near Tewkesbury, on the 24th inst.

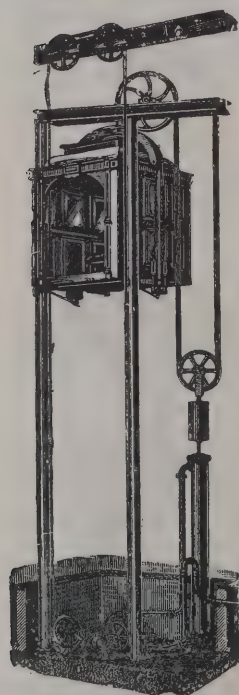
A NEW Wesleyan chapel is to be built at Swallowbeck, near Lincoln.

MEMORIAL-STONES of new Wesleyan Sunday schools, to cost 6,000*l.*, at Westgate Hill, Cleckheaton, have been laid.

THE chancel of Bangor Cathedral is to be completely renovated at the expense of Lord Penrhyn.

FOUNDATION-STONES have been laid of a Primitive Methodist school and vestries, to cost 1,100*l.*, in New Wellington Street, Grimsby.

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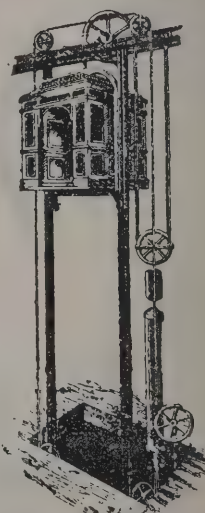
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THE dedication took place on Sunday at St. Bernard's Catholic church, Halifax, of a new high altar that has been erected at a cost of about 500*l*.

THE new Bradford Corporation fire-brigade station in Nelson Street, which has cost 16,000*l*. to erect, was opened on Tuesday by the mayor (Mr. W. C. Lupton).

A NEW Presbyterian church is in course of erection at Fuswell Hill, London. It will provide accommodation for 20 persons, and the cost is estimated at 11,000*l*., of which 3,000*l*. has been received.

AN addition is being made to the ancient parish church of Ackwood, near Knowle, from plans prepared by Mr. Chatwin, architect, of Colmore Row, Birmingham. An organ chamber, an estimated cost of about 300*l*., is in course of erection, and being built to harmonise with the present style of the old building. It is expected that the work will be completed before the end of the year.

THE new Roman Catholic cathedral of Leeds, the erection of which is due to the purchase of the site of the present one by the Corporation, will cost about 36,000*l*. The nave, aisles, side chapel and sanctuary will seat 850 people and the choir, exclusive of the canons' stalls. The choir and sanctuary, which is about 30 feet wide and 50 feet long, has an ambulatory round. The materials to be used are Weldon, Ketton and Ormsay Down stone. The paving of choir and sanctuary floor will be of marble.

THE Governors of the North Staffordshire infirmary have decided to erect a nurses' home in connection with that institution, in commemoration of the King's coronation, and the foundation-stone was laid by the Earl of Dartmouth. The new building, which is to be erected on a site adjoining the infirmary, will comprise 54 bedrooms for nurses and sisters, large sitting-rooms, library, capacious entrance-hall, cloak-room, cycle-room, servants' rooms, linen and box-rooms, 10 bath-rooms and the usual offices. The cost of the building, equipment and endowment is estimated at 10,000*l*.

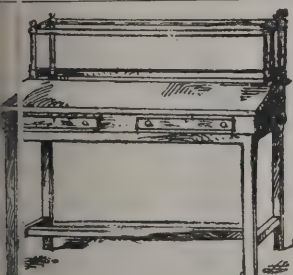
THE foundation-stone has been laid of the new Theatre of Varieties in King's Road, Chelsea, S.W. The theatre, which is being built from the designs of Messrs. Wylson & Long, will be opened at Easter. It has a frontage of 106 feet in the main road and a depth of 150 feet. The front has been designed in a free Renaissance style, and the elevation is 55 feet to the parapet, above which a central dome rises to a further height of 32 feet. The auditorium is 64 feet wide, and

the height from the pit floor to the ceiling is 46 feet. The dimensions of the stage are 80 feet by 31 feet, and the proscenium opening measures 30 feet. The designs indicate that the building will be a handsome addition to the many variety halls erected in the outlying districts of London.

THE housing of the working classes committee of the London County Council have had plans prepared for a women's small model lodging-house to be erected in connection with the scheme for the clearance of insanitary areas in Webber Row, Wellington Place, and King's Bench Walk, Southwark. This locality, it is thought, affords exceptional advantages for the erection of a small women's lodging-house in connection with the block of dwellings and shops it is proposed to erect on the area. The lodging-house will be of four storeys for fifty-seven women on the cubicle system, with a common dining-room and sitting-room, and will occupy a small portion of the whole area. By managing the lodging-house and dwellings in combination it will be possible to effect considerable economies. The architect has also submitted drawings showing how the remainder of the site may be utilised for five-storey block dwellings and shops. The accommodation proposed to be provided is as follows:—101 two-room tenements, 202 rooms; 144 three-room tenements, 432 rooms; total, 634 rooms, accommodating 1,268 persons. There will thus be a total accommodation for 1,325 persons, as against 997 displaced by the scheme. In addition there would be ten shops and a store for administrative purposes in the rear. The cost is estimated at 79,176*l*. The rent proposed to be charged for the lodging-house is 6*d*. per night for the single cubicles and 9*d*. per night each for the three double cubicles, which will be suitable for a woman and her daughter, or two sisters or friends. The rents of the tenements would average 3*s*. 1*d*. per room per week. This, although somewhat high, compares favourably with the rents at the Borough Road dwellings and the Green Street and Gun Street dwellings, which average 3*s*. 8*d*. and 3*s*. 1*d*. per room per week respectively.

#### AUSTRALIAN LAND REGISTRATION.

THE absence of litigation with respect to titles to land is a marked feature of the Australian judicial system and is a result of the general adoption of the Real Property Act as devised by the late Sir R. R. Torrens, and which first came into opera-



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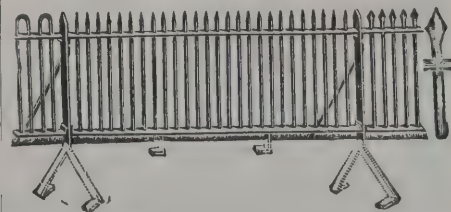


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tion in South Australia. It was introduced into New South Wales in 1862 and completely revolutionised the procedure in regard to land transfers, which until that date had been largely modelled on law existing in England. The leading features of the Act are, according to the New South Wales Government Statistician, the transferring of real property by registration of title instead of by deeds, the absolute indefeasibility of the title when registered, and the protection afforded to owners against possessory claims, as a title issued under the Act stands good notwithstanding any length of adverse possession. From the passing of Torrens's Act all lands sold by the Crown were conveyed to the purchasers under its provisions, and the provisions of the old law were restricted to transactions in respect of grants already issued. The area for which grants under the old system had been issued in 1862 was 7,478,794 acres; since then 1,385,040 acres have been brought under the provisions of Torrens's Act, so that the area still under the old system is 6,093,754 acres. Lands are allowed to be placed under Torrens's Act only when their titles are found to be unchallengeable; but thousands of acres are brought under the Act during the course of every year, so that it is merely a question of time when the whole of the lands of the State will be under a uniform system. For the whole period during which the Real Property Act (Torrens's) has been in operation 19,808,732 acres of Crown lands, valued at 21,477,390*l.*, have been conveyed under its provisions, and 1,441,917 acres of private lands, valued at 24,050,563*l.*, have been brought under it, the whole representing fully 21,250,649 acres, value 45,527,953*l.* One result of the Real Property Act is that in New South Wales, as in other parts of the Commonwealth, land is bought and sold with the greatest ease. The fees paid for registration are, after certain deductions have been made, devoted to a fund for compensating any holder of a registered title whose claim, by reason of some informality, may prove invalid, but such is the care exercised before a title is granted that instances of this character are almost unknown. Every change of ownership, in whole or in part, has to be inscribed on the title. Thus, if the holder of five acres sells a couple, he has to return his deed, which is replaced by a fresh one showing him to be the holder of three acres, a second one being issued to the purchaser giving him a title to two acres. Thus each deed shows only what land the holder is actually entitled to under its provisions. In this way all disputes respecting land ownership are avoided. When it is desired to bring private lands under the Real Property Act, due notice,

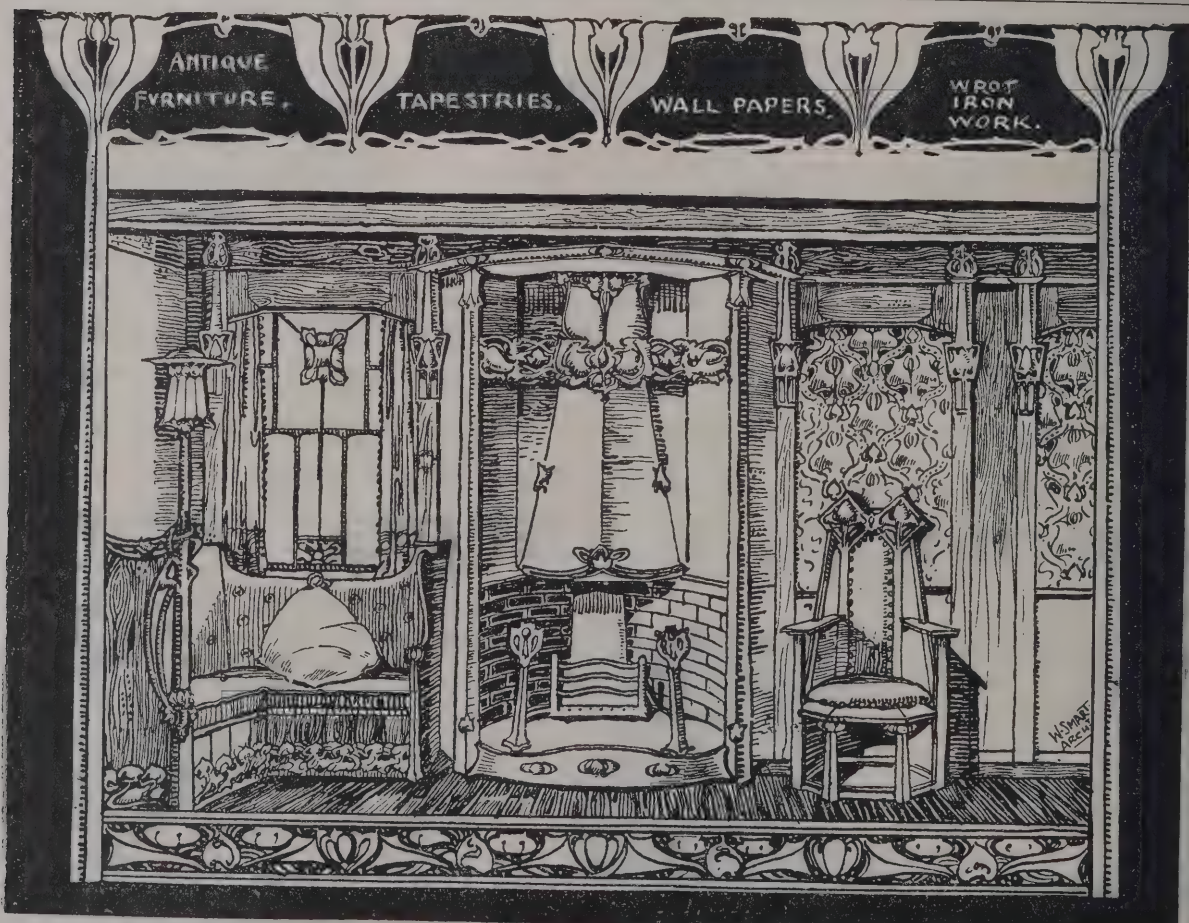
with all documents and necessary information, must be supplied to the Registrar of Titles. If these prove satisfactory particulars of the application are published in the State Government "Gazette" and certain local newspapers, and all objections, if any, have to be lodged by a given date with the Registrar. If any objections are made they are duly inquired into, but if none are forthcoming the deed of title is forthwith prepared. All mortgages have to be registered, and where they are granted on land brought under the Real Property Act, the amount and other details are stamped on the back of the deed of title, otherwise the mortgage becomes invalid so far as the land is concerned. The deed is held by the mortgagee, but he can do nothing without the consent of the mortgagor unless the latter fails in the fulfilment of his contract, in which case the mortgagee can, after certain legal formalities are complied with, obtain possession of the land, a fresh title, or notice of transfer, being supplied him. This obviates the necessity for legal proceedings. When the mortgage has been discharged, the stamped details at the back of the deed of title are marked as being cancelled. If a deed of title is lost, stolen, or destroyed, it can be replaced by a copy marked as a duplicate, and consequently not readily negotiable, but the number of such duplicates is extremely limited.

### CHILDREN'S HOMES, SIDCUP.

In 1899 a site of 62 acres, with a substantial old residence, at Halfway Street, Sidcup, was acquired by the Greenwich Board of Guardians at a cost of 250*l.* an acre, with the residence given in. School homes on the cottage principle, as opposed to the old barrack construction, have been erected thereon by the Guardians for 525 children from the designs of Messrs. Thomas Dinwiddy & Sons, of Greenwich and 54 Parliament Street. A portion only of the site has been used, upwards of 20 acres being in reserve for ultimate building development.

The buildings, which are already in full occupation, are of considerable extent and comprise 24 different blocks, including swimming bath, gymnasium, &c., and were publicly opened by the Chairman of the Board on Thursday last.

The contractor was Mr. T. Rowbotham, of Birmingham; Messrs. Moorwood & Sons, for the engineering; Messrs. Johnson & Phillips, for the electric-light installation; and Messrs. Tilley & Son, for well and pumping machinery.



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## WARRINGTON'S NEW TECHNICAL SCHOOLS.

THE new technical schools situate in Palmyra Square, Warrington, were opened on the 28th inst. by Lord Derby. The buildings cover about a quarter of an acre, and have been erected to afford accommodation for some 500 students in suitable rooms furnished for their different uses and purposes. The laboratory of the biological department is 27½ feet by 20 feet, whilst the measurements of the laboratory and the lecture-room of the chemistry department are 48½ feet by 36 feet and 27½ feet by 27½ feet respectively. For the chemistry department there are also lecture, preparation, class, special, dark reagent's and balance-rooms. The domestic department contains washing, ironing, cooking and sewing-rooms of excellent dimensions, whilst workshops, laboratories, drawing offices, lecture and preparation-rooms have been provided for the departments relating to engineering, plumbing, mechanics, physics and woodworking. In addition, there are classrooms and reading-room, and for the control and management an office, committee-room and masters and mistresses' rooms and stores. Through the main entrance from Palmyra Square is a crush hall, with inquiry office, committee-room and students' room, the remainder of the floor being occupied by the domestic department. The chemical and biological departments are on the first floor, whilst on the lower floor are the rooms for engineering, plumbing, mechanics, physics and woodworking. The electric lighting, heating and ventilation of the building have had very careful attention, and gas and electric-power mains have been laid on for use in practical experiments and for motive power. As a technical school the buildings are complete, but it is under the consideration of the Corporation to perfect the original scheme by erecting a continuation school and pupil teachers' centre at the rear, and the corridors have been so arranged that the necessary intercommunication will be easily arranged. In the further scheme is included a lecture-room of good size, which can be used by different departments, and which itself can also be used in connection with the Parr Hall, or by the public through its connection with the Parr Hall without disturbing the schools. The front of the building in Palmyra Square has been set back 10 feet to allow of ample light to the windows of the lower rooms, and as those rooms are lofty the level of the main floor is lifted considerably above Palmyra Square. The general design of the building is in later English Renaissance, the main weight of

the treatment being kept to the central doorway, and a little richness has been added to the simple treatment of the front by the introduction of carved brick panels, on which are cut the names of scientists and philosophers. The architects for the building are Messrs. William & Segar Owen, of Warrington, and the building has been erected by Mr. C. W. Davenport, of Stockton Heath.

## AUSTRALIAN SOFT WOODS.

THE heavy timbers in which Australia is so rich have become famous for their exceptional hardness and durability, but comparatively little is known outside the Commonwealth of the numerous soft woods admirably adapted for the manufacture of furniture and for other industrial purposes. Such timbers are abundant in New South Wales, and are found principally in the immense brush forests of the coastal districts. Several of these timbers have a wood grained and marked most beautifully, and capable of receiving the highest polish, while others are fragrantly perfumed. Amongst the chief varieties of woods of this class may be mentioned the red cedar, the beautiful wood of which is admirably adapted for the finer kinds of cabinet-makers' work. Some of the cedar trees grow to immense size, as much as 2,500 cubic feet of valuable timber having been obtained from one tree. In addition to the cedar may be mentioned tulipwood, yellow wood, white maple, myall, marble wood, mock orange and many others. Besides their use for cabinet making, many of the brush timbers are of great utility for the rougher kinds of carpentry, while some, both hard and soft woods, are admirably adapted for coach-builders' and coopers' work. The chief description of pine growing in New South Wales is the Moreton Bay white pine, found in the coast districts as far south as the Bellinger. It is soft, light and easily wrought, and suitable for all the interior woodwork of houses, as well as for cabinet making. The red or black pine is extensively distributed over the Liverpool Plains and in the Lachlan and Darling River districts, as well as around Berrima. It is beautifully marked in the grain, takes a fine polish and has an agreeable fragrance. There are numerous other varieties of pine, but these resemble in their main features the trees already described. Australian deal is an excellent timber, and is obtained in very large scantling, the tree frequently reaching

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120 feet in height. It is soft, close-grained, easily wrought and remarkably free from knots. Its use, therefore, is extensive for cabinet-makers' work and house fittings. The New South Wales Government Statistician mentions several of the more useful of the soft and fancy woods of the State. They include the beech, which attains a height of 100 to 150 feet, with a diameter of 3 to 5 feet, giving a strong, white, close-grained and durable wood, easily worked and greatly valued for decks of vessels, flooring, turnery and furniture-making; the black bean, growing to a height of 120 to 130 feet, with a diameter of from 4 to 5 feet, with a handsome, close-grained, dark-coloured, durable wood; the black oak, used for bullock yokes, tool handles, shingles, &c.; and the blackwood, resembling walnut, and highly valued for making furniture. Another valuable timber is the rosewood. It is strong-grained and durable, with a colour resembling Spanish mahogany. Among other woods may be mentioned the silky oak, which attains a height of 70 to 80 feet. The colour is a light grey, beautifully crossed with silvery waves, and when polished the surface has a delicate lustre. Bedroom suites made from this wood possess a dainty appearance. Satin-wood is another useful timber, yellow in colour. It is soft and silky to the touch, close-grained and easily wrought. This wood is also suitable for cabinet-making and is considered to be superior to the satin-wood used in the European and American furniture trade. When the system of forest conservation becomes more general in the State the supplies of many of the timbers mentioned will become practically inexhaustible, and are certain to be in large demand for export purposes.

### WYCLIF CHURCH.

WYCLIF CHURCH, Newcastle-on-Tyne, was opened on the 16th inst. The style of this building is Perpendicular Gothic, freely treated. The accommodation is for 306 adults, or for a mixed congregation of about 350. Provision is made for a future end gallery to seat 100 adults or 120 in a mixed congregation. Total, 470 in the completed structure. The choir is on the platform in front of the pulpit, and the baptistry is in the platform, covered when not in use. The organ is in an apse behind the pulpit. The building consists of a wide nave with hammer-beam open-timbered roof. There are double transepts on each side, with timber arches supported on iron columns, and each transept is lighted with a three-

light traceried window. Two two-light traceried windows are in each side of the wall of the nave. There is a spacious projecting portico in front, with vestibule and inner lobbies. On one side is a vestry, and on the other side a staircase in the tower, which gives access down to the schoolroom, and will give access up to the gallery when it is constructed. There is also a staircase on each side of the pulpit down to the schoolroom, and the minister's and deacons' vestries. The ladies' vestry is behind the pulpit. The seating is arranged semicircularly, so that every hearer directly faces the minister. The heating is by hot-water pipes and radiators. There is an exit door from tower, and another from the back into Northbourne Street. The two front entrances are from Elswick Road. All the doors open outwards. The schoolroom is spacious, and there are also under the church a church parlour, 19 feet by 13 feet, a heating chamber and lavatories, &c. The schoolroom is well lighted with large windows into areas and streets, a ventilating flèche is placed on the roof to withdraw the heated air, with a gas accelerator to assist the upcast, and inlet shafts admit the fresh air. The seats have panelled sloping backs, with book racks, &c., varnished. The windows are glazed with lead lights, and the external walls are faced with red-pressed facing bricks, and have tawny terracotta dressings and tracery, &c. The contract for the building was 4,383 $\frac{1}{2}$ , including boundary walls, gates, railings, &c. The builder is Mr. A. Bruce, Newcastle, and the architects are Messrs. G. & R. P. Baines, 5 Clement's Inn, Strand, London, W.C.

### FIRE DANGERS IN THE CITY.

In a report dealing with the existence of culs-de-sac in the City of London, the Fire Brigade committee of the London County Council point out that in their reports on the large fire which occurred in the Barbican in April last special allusion was made to the fact that the brigade was placed at a disadvantage in coping with the fire inasmuch as it was unsafe to place men and appliances in New Zealand Avenue, a cul-de-sac, the entrance to which was opposite to the premises in which the fire broke out. In their second report they stated that they shared the chief officer's opinion that the existence in the City of London of many culs-de-sac, of which New Zealand Avenue was by no means the worst example, constituted a grave source of danger, and they mentioned that they were consulting the Building Act committee generally on

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the subject. That committee had now informed them that New Zealand Avenue was laid out in 1886 without application or sanction from the then existing Metropolitan Board of Works, and that the by-law, dated May 1, 1857, as to the formation of new streets in London, was not complied with in respect of New Zealand Avenue. The Building Act committee further stated that, having regard to the provisions of section 9 of the London Building Act, 1894, the Council would not now be entitled to refuse its consent to the formation of a street within the City on the ground that it would constitute a cul-de-sac. No list of the culs-de-sac in the City appeared to be in the Council's possession, and the preparation of a correct and complete list would necessitate a careful survey, but from an examination of the Ordnance sheets there would appear to be at least forty-five such places within the City.

### NORTHAMPTON MASTER BUILDERS' DINNER.

THE annual dinner in connection with the Northampton Master Builders' Association was held at the Plough Hotel Assembly Room, Northampton, on the 23rd inst. Mr. John Bird (president of the Association) presided, and was supported in the vice-chairs by Mr. W. Higgins (vice-president of the Association), Councillor A. J. Chown (a past president), &c. After the dinner the Chairman gave "The King," and also The Queen and Prince and Princess of Wales and the rest of the Royal Family," which were loyally honoured.

"The Army, Navy and Reserve Forces" was submitted by Councillor A. J. Chown, and Bandmaster W. Ashton, whose name was coupled with the toast, responded.

Mr. G. W. Souster proposed "The Mayor, Magistrates and members of the Corporation."

Councillor Green proposed "The Architects," and referred with pleasure to the presence of the borough surveyor.

Mr. Sidney Harris returned thanks, and said it was very gratifying to the architects to know that they were on such a footing of good fellowship with those on whom so much of their own success depended. The speaker also commented on the striking differences that were often to be noticed between the highest and lowest tenders for large contracts, and said it was regrettable.

Mr. G. H. Stevenson submitted "Success to the Northampton Builders' Association," and said there was no class of men who had to put up with such a number of worries and

cares as the builder, and the greatest worry, so far as his experience went, was in many cases owing to the want of ability in the men he employed. Half the loss and the whole of the worry which builders and architects had to put up with were owing to the incapacity of the men they employed. There were good men, but they were a small percentage. There was a good deal of talk about badness of trade, but he never met a really good man walking about doing nothing, and if men would only qualify themselves to do their work properly there would not be so many idling about and applying for relief.

The President, who met with a hearty reception, in reply, said the Association was a good deal of use in many ways. It brought the members together periodically, and kept them posted up in what was going on in the trade all over the country. It also tended to lessen any friction that might exist between the members and their employes—that was one of their principal objects. It had dealt in many instances fairly and equitably with disputes that had arisen which otherwise might have caused much friction in the trade. They were pleased to know that it was a successful Association, and everyone connected with it, he believed, did his best for its furtherance and for the furtherance of business in the town.

Mr. F. D. Jeavons submitted "The Town and Trade of Northampton," and said that every time he came to Northampton he noticed some improvement—it might be small, but it was always evident.

Mr. George Ellard replied in a capital speech, and said he had come back from a visit to America with the conviction that the work turned out in that country was a good deal better than English work, for the one reason that, although American workmen were no better than English working men, though they had the same machinery to produce the same goods, the incentive given to the men was so much better than the manufacturers gave on this side of the water, and that produced better results. If their manufacturers were only to encourage their men, if they were to bring in what was called the piece-work statement instead of paying their 4s. or 45s. a week for working from eight in the morning to half-past six at night, it would be much better. If the workman was encouraged to get through as much work as he could, to do it as well as he could, and to help the master to get as much work as he could, England would be in front of the Americans. Without that they had not a "look in" with them. Every factory he went to in America, and he went to a good many, was full of orders. When the Americans had filled their own markets they must

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come over this side, and then God help the British manufacturer unless he looked up and paid his workmen satisfactorily.

Councillor A. P. Hawtin proposed "The Visitors," and Councillor T. L. Wright responded.

Mr. C Archer gave "The Chairman," and the toast was very heartily drunk, musical honours being accorded.

Mr. Bird suitably returned thanks.

Councillor W. Heap proposed "The Vice-Chairman," Mr. W. Higgins replying.

Councillor F. Letts, in submitting "The health of the Secretary," referred to Mr. Airs's energetic work and his willingness to do anything to help forward the Association, and especially instanced the Insurance Association, remarking that he had left no stone unturned to make this a success.

This toast was also drunk with musical honours, and Mr. Airs, in reply, mentioned that it was the twenty-sixth time he had responded to the toast. He was glad that the membership of the Association kept up to the standard—they numbered more than when the Association was first started—and it was very pleasing to find that so many of the members who were with them at the commencement were still members of the Association. The fact that they were quiet and had no troubles showed that the Association had done a vast amount of good. The Association had also tended in a great measure to cement the good fellowship between the members of the building trade, a feeling which was evident all the year round.

The concluding toasts were "The Press" and "The Host and Hostess."

### WIRE-GLASS WINDOWS.\*

THE subject for which I shall have the honour of asking your consideration will be "Wire-glass," the fire-retardant, a building material which tends to reduce to the minimum the hazard of conflagration, and conduces to the elimination of some risks attending the lives of us humble fire-fighters. The range of possibilities in fire-protection is too wide to speak of here, if I am to be favoured with your attention, and only a small portion of it can be engaged in during this short session.

\* A paper by Edward F. Croker, chief of Fire Department, city of New York, read at the thirtieth annual convention of the International Association of Fire Engineers, New York.

I shall endeavour to advance that which I believe to be the most important factor in the protection of buildings against conflagration, and I shall be amply rewarded if I enkindle in your minds an inclination to seek more information upon the subject than I am enabled to communicate.

It is manifest to all thoughtful minds that the phenomenal development of the real estate values in our cities has made the tall building a necessity, and this necessity has brought with it the need of adopting in building construction barriers to conflagration, and there are to-day buildings capable of enduring without structural injury the action of fierce, long-continued interior and exterior flames and the application of cold water upon their heated surfaces. Structurally a building of this class is admirable—the foundations are secure, the walls and roof fireproof, but openings in walls and roof are necessary to render it habitable. Obviously the vulnerable parts of a building are the openings in the walls and roof—its doors, windows and skylights. To these openings the spread of flame is almost wholly attributable. This has been the history of so many destructive conflagrations that experts have long agreed that no structure in a closely built city can be considered even approximately secure against fire so long as it is provided with only ordinary windows, skylights and doors. My experience and observation have been such as justify this opinion, and I have most strenuously maintained that the quantity of wood contained in what I have termed "a structurally fireproof building," taking into consideration also the furniture and fittings, would, in the event of fire, endanger the property and the lives contained within it.

Shutters of iron or of metal-coloured wood may protect windows if they are carefully closed, but in practice such shutters fall short of the purpose for which they were intended. When the crisis comes the shutter is frequently found open. Under the most favourable conditions an iron shutter at a fire is not the thing that the firemen want to come in contact with. Its rusty fastenings and blistering sides are objectionable, to say the least, and its reach, when it swings open, is liable to knock a man off the ladder. This is a risk to which the fire-fighter should not be subjected. There is no braver, manlier or more faithful set of men in the public service or out of it than the brave lads enrolled in our fire departments. I know of whom I speak, and I am well acquainted with the chances they take. They are ready to fight with death every day. Every year sees them saving life heroically or dying in their duty. Their work is as trying, difficult and dangerous as

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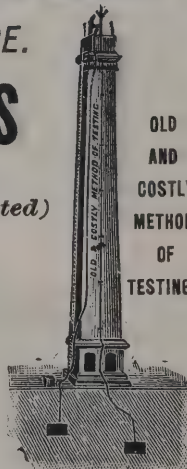
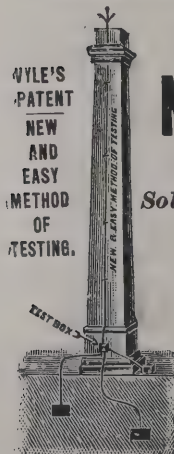
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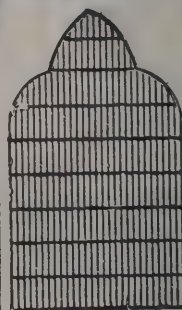
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here is in the world. Yet they are not safeguarded. I know that ready fellows they are, and I feel that all known means of protection should be adopted to render their calling less hazardous.

Wire-glass is, in my opinion, the fire-stop for window and skylight openings—wire-glass set in metal frames. It supplies the requisite light and ventilation as well as protection against fire; its installation obviates the necessity of the cumbersome and unsightly hinged shutters and the projecting lugs and adjusters which support and secure them. It affords protection regardless of the janitor's neglect, because the thought of fire is not necessarily present in the mind of the tenant to induce him to close the window-sash, and when closed it prevents the ingress, egress or communication of flame. It enables the chief to size the situation and direct his men intelligently. The location and volume of the blaze are immediately discovered, and if the conditions warrant it the fireman can effect an opening for the stream with his fire-axe.

Hard conditions, great risks and the sacrifice of large property and many lives are preliminary to the establishment of standards, and by such means wire-glass has come to be recognised as standard, and the degree of honour which is its legitimate due should be generally recognised.

Succinctly stated, wire-glass has yielded two fixed values as a contribution to fireproof building construction:—

It retards fire without hiding it—permits the blaze to declare itself.

It can be cracked, but it cannot be scattered. If fractured it retains its place.

Now we have to remember what we cannot forget, and we are mindful, therefore, of experiences which enable us to fully appreciate the value first stated. Of the many embarrassments to which the fire-fighter is subject, that which prevents fire from disclosing its location in its incipient stage is the most serious. Within the congested districts of our great cities our organisations are such as enable us to reach the scene of action and have our nozzles in hand within two or three minutes of the alarm, and if we could immediately get at the fire we would, in most cases, have little difficulty in confining the blaze within the limits of the apartment in which it originated.

Modern science has equipped our departments with devices necessary to combat fire, the most contagious, virulent and disastrous of all perils to which buildings are subjected, and modern science has devised the means by which fire can be confined within the walls of buildings without rendering the

same inaccessible to us, but the adoption of the means available is not general, and upon arriving at a fire we are frequently confronted with tin-covered and iron-clad shutters which obstruct our vision and our efforts to locate and conquer a blaze which becomes a conflagration, because of the precious moments lost in concentrating our energies upon the seat of trouble.

This condition has long been a serious menace in all cities, and it is now intolerable because the installation of wire-glass presents no technical difficulties. It is of acknowledged efficiency and no less economical than effective. It has withstood the severest tests, and its cost is well within the means of all building owners. The insurance companies give preferred rates when it is installed, and thus practically invest in it. Their scheme is to reduce hazards, and in the belief that wire-glass effectually accomplishes this they induce its adoption by substantial endorsement. Its ability to abate horrors and loss which attend conflagrations in cities is ample justification of the reasonable laws providing for its adoption, and an exigent public duty is presented to building inspectors to prevent these laws being nullified by official inertia.

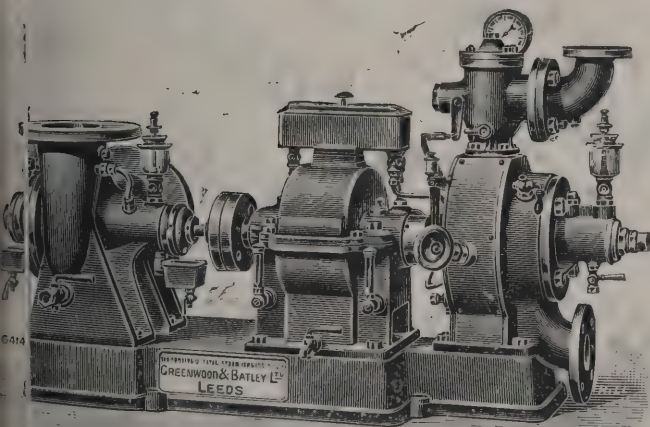
There is a region paved with good intentions, and many easy-going owners of buildings contribute to this paving fund by deferring the adoption of known means of protection and at the same time create occasion for regret from heavy financial loss and probable loss of life. I want to see the obligation placed upon owners of buildings to prevent such losses by the means which will effectually render fire non-communicative, and I think I have specified the means. The significance and overwhelming argument in favour of wire-glass as a fire-stop is the fact that when fractured it retains its place and continues to retard draught and its attending flames.

Doubtless many of the chiefs present have had occasion to recognise the efficiency of wire-glass as a fire-stop, and, of the many, Chief Musham's experience is especially worthy of reference. The fire which destroyed the Armour Lard Refinery, Union Stock Yards, Chicago, on the night of May 16, threatened for a time the entire district. Chief Musham was present, and he has stated that the wire-glass in the windows of the several walls prevented any communication through them and demonstrated the ability of wire-glass to prevent the spread of flame. The building destroyed was of recent construction, 100 feet by 400 feet, five storeys in height, and subdivided into four sections by fire-walls, two of which were completely destroyed.

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The quantity and nature of the material in combustion—refined lard—resulted in the hottest kind of a fire, and its intensity and duration are hardly comprehensible. The chief tells me that the flames reached to a height of 150 feet above the roof, and the combustion was so perfect that scarcely any sparks were observed.

I am quoting Chief Musham because I think perhaps his observation of wire-glass in this instance was under a better condition than can be conceived for an actual service-test of wire-glass. The entire interior of the building was of inflammable construction, made more so by being saturated with lard, and its five great floors were loaded with tons of this highly combustible product. Tanks containing thousands of gallons of rendering were exploded and their contents dashed against the walls and windows, and the intensity of the heat was so great that the walls holding the frames and sash which accommodated the glass crumbled, but until they fell the wire-glass retained its place.

This fire establishes conclusive proof of the efficiency of wire-glass as a fire-retardant and its staying qualities, and for the purpose of illustrating my subject I have considered it preferable to my own experience.

### BIRMINGHAM SEWERAGE WORKS.

A QUARTERLY meeting of the Birmingham Tame and Rea District Drainage Board was held on Tuesday at the Council House. Alderman Baker presided, and there were present the Lord Mayor (Alderman J. H. Lloyd), Aldermen Dr. Barratt, Ash and Bowkett; Councillors Lancaster, Halse, Parkins and Barber; Messrs. J. J. Gittings, J. J. Hughes, J. Gosling and T. E. Bladon.

Councillor Lancaster presented the report of the finance committee, which recommended that 3,643*l* 6*s*. 1*d*. be borrowed, at 3½ per cent. interest, from the Corporation of Birmingham. He said the money was required for the purpose of spreading the repayment of the thirty-years loans over sixty years.

The recommendation was approved, and accounts were passed amounting in the aggregate to 26,954*l* 8*s*. 11*d*.

Alderman Dr. Barratt brought forward the report of the works committee, and proposed the approval of the drawings which had been prepared by the engineer for the bacteria filter-beds, for which the board had decided to apply for sanction to borrow 40,000*l*. He said it was obvious that the

increase of the population of the united district must involve some addition to the outlay. This year there were 2,400 more rated tenements to be provided for than in the previous year, but a reduction in the precepts was made. The amount of charge upon the ratepayers must be calculated on the rate per pound which the precepts involved, and when that was taken into account the reduction was more marked. It was not possible that a decrease in the total amount raised could be continued; for it was to be noted that the normal rate of increase of the population would demand the use of 1·15 acre more per week in the land required for purification. If, however, they could arrange that the rate in the pound should not be increased it must be considered satisfactory, and that—although no absolute pledge could be given—they hoped to be able to secure. The demand for land could not be indefinitely met, and, although provision was made under the Act for some future requirements, that calculation was made before the Local Government Board determined that an addition should be made to the area of the united district by the inclusion of a large part of King's Norton and Northfield. There was, therefore, a great necessity that, if possible, some means of artificial purification should be adopted. That the advance in bacteriological science, both in theory and in practice, might provide. Pending the fuller investigation of the subject, the board, having a large area of land to make use of, did not deem it wise to make expensive experiments themselves, whilst carefully watching those made in other places. There was now sufficient knowledge available to justify works of that kind, and the beds at Minworth Greaves had been sanctioned by the board, and drawings were submitted for approval.

The resolution having been seconded, the Chairman said the committee were thoroughly satisfied that the bacteria beds were required. Looking at their work from every point of view, and notwithstanding their great expenditure, it was hoped that there would not be any increased demand on the different districts next year for contributions to the general fund. The board were certainly spending a great deal of money, but by the exercise of the strictest economy they hoped it would not be necessary to increase the rate.

The resolution was carried, and it was also resolved to ask the Local Government Board for sanction to the borrowing of 40,000*l*. in respect of additional expenditure, and 10,000*l*. for the construction of tanks at Ashold and Tyburn.

The report was approved.



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# The Architect.

## THE WEEK.

REALISM does not appear to have succumbed under the severe condemnation of it by the Emperor of GERMANY nearly a year ago. His MAJESTY has, therefore, returned to the charge, and on Sunday last he delivered a similar discourse at the opening of the art colleges which have been erected in Charlottenburg. The EMPEROR said he addressed a earnest warning to both masters and pupils to guard and preserve the ideals of art in the paths indicated by tradition and by the immutable laws of beauty, harmony and aesthetics, while closely adhering to the unattainable Classic models and faithfully following the numerous great masters of all succeeding centuries who consecrated themselves to art and further developed it, and especially those masters who either taught or received their training at the Academy. The subject, as we pointed out on the first occasion, is one which bristles with difficulties. What law of art can be taken as immutable? It is impossible to attain certainty about the type of art which is best adapted for imitation. METZKE, who was a realist during the greater part of his life, suggested, in the second part of "Faust," by the union of JUST and HELEN OF TROY, that Germany and Greece should become as one. But German idealism in painting and sculpture has always retained traces of Iceland and Scandinavia. Figures of BRYNHILD, SIGURD, HAGEN, GUDRUN and other heroes and heroines of the ancient legends would be recognised if they were presented in the slim and graceful proportions of the best Greek statues. The idealism which was at one time popular is no more adapted to represent life at the present time than the life of the Vikings and Niblungs. There are grim tragedies constantly being enacted in Berlin and other German cities which would become mockeries if they were depicted in a manner that would be fraudulent evidence of the absence of error and of suffering. If artists have by nature an inclination to the refined sentimentalities which were popular one time, let them follow their bent. But to compel artists to falsify the scenes they meet with may have political advantages, but it does not conduce either to truth or to the advance of fine art.

It is a common practice for representatives of trades unions to interview or communicate with employers and to suggest the possibility of a strike arising unless there is a cessation of some practice alleged to be contrary to accepted custom, or the dismissal of some employé who has given offence by his conduct. Is it, however, according to law for builders' society to imitate that practice? That was the question which had to be answered by the Lord Chief Justice, Mr. Justice WILLS and Mr. Justice CHANNELL on Tuesday. There was a strike at St. Anne's in 1899, in which the plaintiff, a joiner, took a prominent part. Afterwards he found employment at a different place. The St. Anne's Master Builders' Association notified the Lancashire and Cheshire Society, to which the plaintiff belonged, for the purpose of obtaining his dismissal. It was a rule that no member should employ a workman who was locked out from the workshop of another member. He was accordingly discharged. A claim was made in the Blackpool County Court by the plaintiff, but the judge considered there was no evidence to support it. The plaintiff appealed. The Lord Chief Justice said that some domination between masters might be lawful, and plaintiff's employers were within their legal rights in ceasing to employ him. They anticipated trouble with the co-federated society if they retained him. There was no breach of contract and what they had done was for the protection of their own interests. The appeal was dismissed, but the case is to be carried to a higher court.

The case of READ v. Friendly Society of Operative Stonemasons and Others, which came before the Court of Appeal on Tuesday, has an important bearing on the subject of technical education. A man is supposed to be too old to learn, but if he have a wish to become a journeyman he cannot do so in England if his age exceeds sixteen years. That at least was the theory of

the Friendly Society of Stonemasons at Ipswich. There was an exception for masons' sons and stepsons. The plaintiff, who was twenty-five, agreed to serve as an apprentice for three years, receiving 15s. a week as wages. The Society objected and threatened a strike, and the man was compelled to return to labourer's work. He sued the Society for damages for maliciously inducing his masters to break their contract with him. In the County Court the judge said as no improper motive could be alleged, there was no cause of action against the Society. The plaintiff appealed. The Lord Chief Justice followed the dictum of Chief Justice ERLE, who held that "the procurement of the violation of a right is a cause of action in all cases where the violation is an actionable wrong," and there was no evidence to show that the Society, or any of its members, would suffer by the fulfilment of the contract with the plaintiff. The defendants appealed, and, as will be seen from the judgments printed in our supplement, they have not succeeded, and will have to pay 50% to the plaintiff.

THE last part of the Journal of the Sanitary Institute is devoted to the proceedings of the Congress at Manchester, which was held in September. The addresses and papers are of exceptional importance. Among the recommendations of the sections were the following:—"That in the opinion of this conference the time has arrived for the consolidation and revision of the existing Public Health Acts, and that the Local Government Board should be urged to give the subject their serious consideration with the view of bringing it as soon as conveniently possible before the notice of Parliament. That in the opinion of this conference the period for the repayment of loans under the Housing of the Working Classes Acts should be extended to 100 years for land and eighty years for buildings, and that the Local Government Board should be empowered to authorise loans at a low rate of interest. That this conference is of opinion that the time has arrived when no person should without permission of the local authority open up, alter, add to or otherwise deal with the drainage or sanitary appliances of any house, building or premises. That all drains and sanitary appliances be constructed and required to stand the hydraulic or other equally satisfactory test to be applied by the inspector of the sanitary authority before such work be covered from view or passed. That this conference is of opinion that all waste pipes ought to be trapped as close to each fitting as possible, and that the Local Government Board be requested to remodel their by-laws." The Institute, it should be noted, did not consider it desirable to take action with regard to all the resolutions.

STUDENTS of the history of art will learn with regret of the death of EUGÈNE MÜNTZ. Officially he was the conservateur of the Ecole des Beaux-Arts in Paris, and his "Guide" to those who wish to participate in the benefit of that great school has sufficient interest to make it eligible for a place on the bookshelves of amateurs. Among modern scholars he was unsurpassed for the labour he spent in researches. The Renaissance in all its amplitude was the theme which inspired him. The three noble volumes on "The Primitives," "The Age of Gold," and "The Decadence" in Italy comprise only a part of his inquiries. He was anxious to pursue the subject as presented in other lands, and one of his first projects was to treat of the Renaissance in England. From the scheme he had prepared it was evident that he was well acquainted with all the English books on the subject. Reviews of most of his works have appeared in this Journal. His life of RAPHAEL and his popular handbook on tapestry have been translated into English. The erudition of EUGÈNE MÜNTZ was no less visible in small tracts which he read before societies or prepared for a temporary purpose. He contributed much to *L'Art* and other periodicals. As a referee on difficult questions he was constantly in request. Although he had produced so much and of a kind which required evidence for every paragraph, EUGÈNE MÜNTZ was no more than sixty years old at his death. He had accumulated data for several other books, and it is no exaggeration to say that not only France, but the civilised world, is the loser by the passing away of so eminent a scholar before the work he had planned was accomplished.





PAINTERS' ARCHITECTURE: ANDREA MANTEGNA.

## PUBLIC WORKS IN IRELAND.

THERE was a time when the shortcomings of the Irish Board of Works afforded perennial subjects for ridicule on and off the stage in Ireland. As a public department it was not more inefficient than many others. But the failures were object lessons which could not be misunderstood. A road which was only partially adapted for traffic, channels which exemplified arterial drainage by flooding lands, reclamations which could only produce weeds, were supposed to be visible in all parts of the country. The failures were in most cases caused by want of money rather than by any deficiency of skill in the Board's officers. It was at one time revealed at a trial of an accountant of the Board for applying funds to his own use, that the chairman was accustomed to send bundles of blank cheques in a canal barge to the head office (there was no parcels post in those days), and was indifferent to the amounts which were afterwards inscribed on them. The House of Commons, in consequence, declined to vote large sums to be expended by an establishment which was without efficient control, and a great many undertakings came to a premature end. Estimates for public works were often prepared by the Board's officers on insufficient data. On the figures the sanction of the people who were to be considered as borrowers was obtained. The outlay exceeded the estimates, and it became a serious question how far financial obligations were incurred by owners of property to pay expenses of which they could have no knowledge when they entered into agreements with the Board. The Government acted in an equitable spirit. The grand total of the sums advanced by the agency of the Commissioners for Works of various kinds has been 44,288,120*l.*, and the amount remitted is nearly one-fifth of the total, being 8,070,947*l.* Can a parallel to so much generosity be found in any other country?

The Commissioners have now a far greater variety of subjects to control than their predecessors in the days when Colonel HARRY D. JONES, R.E., was chairman. But there is apparently a more business-like method followed. Complaints are in consequence less common. It is also remarkable that in a country where charges of dishonesty are easily created, not a word is heard about illicit commissions arising out of the numerous contracts of the Board. The utmost that can be alleged is that the Commissioners are not over-generous in advancing public money and are careful about securities. The Irish people, it should be known, cannot realise that when the State lends money the transaction is to be treated on the same footing as the loans of ordinary creditors. Local bodies will pay promptly the dividends on stock held by private persons, but it is taken for granted that instalments due to the Board of Works need not be paid until at least thirty days of grace have elapsed. This is ungracious treatment,

for the Treasury is considerate in its arrangements. One example will suffice. Last year the sum of 115,000*l.* was advanced to the Cork, Blackrock and Passage Railway to help in the completion and equipment of a line to Crohaven. Legally the loan should not have exceeded 65,000*l.*, but the case was supposed to be exceptional and collateral security was dispensed with. The usual rules for repayment were modified, with the result that during the first six years the company will have to repay only 5 per cent. of the principal instead of 14½ per cent. Other cases no less lenient could be cited.

We need not enter into all the undertakings for which the Commissioners are responsible. Fisheries, railways, arterial drainage, inland navigation, harbours, reclamations &c., are of unquestionable importance, but architects and builders rarely have a share in them. It will be more convenient to restrict our attention to subjects immediately related to buildings.

"The Castle," which is the town residence of the Lord Lieutenant as well as a collection of the principal offices of the Government, is generally dull in appearance, but is transformed during the "season." Then, as if it were a theatre, the properties are taken out of the stores and arranged to give effect. A covered bridge of concrete and iron has been constructed in order to facilitate the supply and removal of the furniture required for the State apartments. At the Viceroy's house in Phoenix Park a water-supply has been provided in order to cope with fires. Phoenix Park is available for games of cricket, football and hurling. In some restriction is demanded to prevent damage to the turf by grooms and trainers of racehorses. Restraint is also imposed by motorists and cyclists, who there adopt the notion of liberty, which is power to annoy other people with impunity.

We have more than once referred to the Italian ceiling in the Royal Hospital, Kilmainham, which was the most elaborate example of that class of work in Ireland. It became unsafe owing to the key of the stucco plaster having failed through disintegration and the enormous weight of the ceiling. Three courses were proposed, viz.: (1) repairing the existing ceiling; (2) erecting a new ceiling on similar lines and of improved architectural character as proposed by Sir THOMAS DRUMMOND; (3) erecting a reproduction of the existing ceiling. The Treasury directed the following of the third course. A contract has been made with Messrs. JACKSON, and all the parts required have been sent to London to serve for a reproduction. A part will be reserved for the Technical Museum in Dublin. The remainder has been demolished. It is hoped that a small portion may be introduced into a reproduction.

Public education in Ireland is conducted on a different monetary system to that proposed for England. Although it was supposed the country was provided with buildings



The average expenditure has to be about 30,000*l.* a year. Between 1882 and 1902 the outlay was 624,088*l.* Standard plans have been prepared, and there are also standard prices for estimating, of which it is said that "as a scale is applicable to the whole of Ireland, it obviously cannot be strictly accurate for all places, but though it may be slightly too favourable in some cases and too unfavourable in others, the estimates are believed on the whole to be equitable to those who have to build the schools."

One important part of the Board's authority relates to the protection of ancient monuments. In the last report there is much to suggest how persistent are the efforts to remove ivy from the ruins. Opinions differ as to whether the creeper is really a danger. It has been supposed that, as the song says, "the walls must be crumbled, the stone decayed to pleasure its dainty whim." On the other hand, antiquarians have declared that ivy draws moisture from walls, and is therefore a preservative against damp, with all the evils that follow. The theory held by the Board of Works is that ivy is injurious, and it is therefore removed. The ancient masonry which is revealed is not always picturesque, and archaeologists respect truth, and it must be owned that ivy often served to conceal evidence against fallacious theories. The Abbey of Ennis, the Church of Drumlane, the Abbey of Ross-Errilly, St. Cronin's Church, the buildings at Glendalough, Holy Cross Abbey, Monasterboice, Sligo Abbey, Lusk Round Tower, Ardmore Cathedral, are among the remains which were cleared from ivy. In one place there was such a mass of vegetation it was necessary to cut the ivy at the roots and to wait until the branches had withered for their removal. Tourists who seek immortality by cutting their names on stones will, no doubt, be grieved when they learn that the Board is so pre-empting as well as of ivy. The expenditure on national monuments cannot be considered as extravagant. The outlay varies from 3*s.* 6*d.* at Clonkeen to 52*l.* 1*s.* at Dromcliff, the total being no more than 332*l.* 4*s.* 9*d.* during the past year. The salary and travelling expenses of the principal surveyor, caretakers' wages, &c., in addition came to 59*l.* 1*s.*, or in all 591*l.* 5*s.* 9*d.* We give elsewhere the report on Canon's Island Abbey, co. Clare, which will suggest that archaeological investigation is not neglected in the details.

Among the works on which expenditure is authorised are more urgent than the erection of labourers' dwellings in towns as well as in country districts. During the past year nineteen applications were sent in for loans to erect buildings in towns, and thirteen were approved. The amount to be expended is 19,720*l.* Three of the loans amounting to 1,389*l.* were for private individuals. The money may appear like a drop of water in a lake, but since 1868 no less than 977,313*l.*, or nearly a million, has been obtained for the benefit of the working classes in towns. In the country there is, if possible, a stronger necessity for the removal of hovels. Last year the advances were 157,810*l.*, and the total amount sanctioned since 1883 has been 2,428,402*l.*

Only one application was received for a loan under the Public Libraries Acts. It was favourably considered, but there was no necessity to obtain money in that way, for the work was carried out by local effort. In Ireland, as in England, lunacy is increasing, and no less than twenty-eight applications for money to build asylums were received. In the last year seven loans were given to the extent of 113,095*l.* Loans for workhouse buildings were 49,467*l.* Those under the Public Health Acts during the year amounted to 57,82*l.*, making a total of 3,339,192*l.* for waterworks, sewage, paving, public lighting, &c. During the last year the arm buildings completed by loans from the Board authorised by the Lands Improvement Act cost 42,884*l.*, and the arm buildings commenced represented loans of 28,645*l.* The figures given are indications of efforts to improve the material. In the last year the National Debt Commissioners enabled the Board of Works to lend 55,69*l.* So large a sum could not be expended under financial control without many benefits arising to the country. There is little doubt that still larger sums could be obtained if satisfactory projects were devised, but under the peculiar circumstances which prevail in Ireland there is as yet only a limited desire to accept aid which involves the regular payment of sums to meet principal and interest.

## MORRIS ON ARCHITECTURE, INDUSTRY AND WEALTH.\*

IN his political exercises the late WILLIAM MORRIS was not unlike CANNING's "Friend of Humanity." His views were expansive if vague. He might talk or write about "comrades" and believed he was stoutly aiding the "common weal," but the men he addressed knew they were little more than abstractions for him. Occasionally he made spasmodic efforts to appear as the ordinary street rioter. He was not able, however, to convince the stupidest policeman that he was a danger to the public security. Considered as an artist we find no trace of the nebulous vastness of the amateur socialist's views. It was evident he did not consider he was competent to discharge the multifarious duties of an architect, and preferred to become an auxiliary. At first MORRIS and his friends, when they turned shopkeepers, were willing to supply furniture, stained glass, metalwork; but after a time his inclinations became more definite, and it might be said that he restricted his own participation to the production of textiles of various kinds and wall-papers. As became a craftsman, he recognised, if he did not always obey, the necessity of concentration.

In the addresses he delivered throughout the country we see this power of limitation asserting itself. As a rule lecturers to popular audiences generally select subjects so comprehensive as to be outside the criticism of specialists. The history of architecture in all countries would be on such occasions as easily exhausted in an hour as the "Bible and Geology," the "Philosophy of Evolution," the "Principles of English Law," or subjects no less important. But MORRIS, instead of attempting to unfold the whole history of architecture to the friends of the Society for the Protection of Ancient Buildings, was content "to call attention to certain things he had noticed in studying the development of the art of pattern-designing from ancient times to modern," and the audience must have been wanting in appreciation if they did not realise how much was gained by the exchange. In another lecture which had the same object, architecture is suggested by arts which were associated with it, such as pottery, glass-making, weaving, dyeing, printing patterns, furniture and dress.

The volume of lectures and papers having for title "Architecture, Industry and Wealth," of which a new edition has appeared this week, will enable the reader to enjoy WILLIAM MORRIS at his best, even if he has to regret some divagations. The "History of Pattern Designing," the "Lesser Arts of Life," "Textile Fabrics," the "Revival of Architecture," the "Revival of Handicraft," "Art and Industry in the Fourteenth Century," the "Influence of Building Materials on Architecture," and the "External Covering of Roofs" are all revelations of the trained observer and the genuine workman who was on the lookout for information that could be turned to profitable use. In "Art, Wealth and Riches," "Art and Socialism" and "Art under Plutocracy" we have the spectator who had no fear about his competency to undertake an obligation like the one before which HAMLET quailed, and to set right a time which is out of joint.

In treating the second class of subjects MORRIS, although so much of a man of business, was not able to resist a common fallacy. He saw in museums, private collections and auction-rooms objects which were originally intended for everyday use, and for which amateurs now willingly give large sums. He concluded that in the days when they were produced all things were no less beautiful. An extract from "Art under Plutocracy" will serve to suggest his reasoning:—

In the times when art was abundant and healthy all men were more or less artists, that is to say, the instinct for beauty which is inborn in every complete man had such force that the whole body of craftsmen habitually and without conscious effort made beautiful things, and the audience for the authors of intellectual art was nothing short of the whole people. And so they had each an assured hope of gaining that genuine praise and sympathy which all men who exercise their imagination in expression most certainly and naturally crave,

\* *Architecture, Industry and Wealth.* Collected Papers by William Morris. (London, New York and Bombay: Longmans, Green & Co.)



and the lack of which does certainly injure them in some way, makes them shy, over-sensitive and narrow, or else cynical and mocking, and in that case well-nigh useless.

It will be observed that in this passage, which is only one among many inspired with the same spirit, not a word is said about time or place. No research will discover for us a period or a country when all men were more or less healthy artists. The statement would be more effective if it commenced "In the Atlantis" or "In the Country of Nowhere" or other Utopian region, for then we need not attempt to apply the historical test to so beautiful a vision. MORRIS when he spoke about the past was displaying his imaginative strength, and it is difficult to resist the conclusion that he was still imagining when he went on to assert that "in these days the whole people is careless and ignorant of art," or foretold the supremacy of Socialism hereafter. If ignorance still prevails, then his own employment at South Kensington, his own productions as a manufacturer, his own speeches and writings were of little advantage, and he was almost bound on principle to retire from his position. Why continue to keep up an illusion if no benefit to the public arose from his efforts? The fact was he could not be an impartial critic about the products of our time. His own theories of healthy art were exemplified in the wares of MORRIS & Co., and it would be demanding more heroism than is to be expected in trade if he were not supercilious to the productions of other firms who sometimes were his rivals.

That MORRIS & Co attained success as measured by profit in money could not be questioned. It was evidence that the age was not insensible to what was believed to be art in the fullest sense of the word. Other firms might also thrive if they were able to surround themselves with a like glamour. MORRIS's success was not perhaps of the kind he desired. With all his imagination, he was not able to refer to patrons who, by surrounding themselves with Morrisonian products, had attained that enviable state of mind which was said to be the characteristic of the men and women of the fortunate ages when art flourished, and they came under "the humanising influence which the daily sight of beautiful handiwork brings to bear upon people." All history that is authentic is against that belief. In Athens, Rome, Florence, Nuremberg, wickedness prevailed in palaces and public places which no work of art could repress. Art is good and useful, but it is not an universal remedy for the ills that the mind is heir to, and all MORRIS's assumptions are, therefore, based on fallacies or fancies to which his poetic mind gave importance. The addresses are, however, revelations of one aspect of his character.

A rough division may be made of his addresses, and we can say he was far more successful in their composition when he treated of inanimate objects, rather than when he discussed the acts of living beings. Take, for example, the following passage relating to roofs, which suggests that his observing eye was always at work, and that its records were faithful:—

In the Middle Ages (or indeed down to the end of the eighteenth century) all roof coverings were more or less good. Lead (properly cast and of a due thickness), oak shingles, well-made red tiles, which weathered beautifully, straw, or reed thatch, stone slates or slabs, or at the worst slates smaller, thicker and less mechanically dressed than those now in use, made it almost impossible for a roof to be really ugly, and more often insured its being actually beautiful. The older parts of Edinburgh, for instance, owe much of their good looks to the houses being roofed with small, thick, dark coloured slates, and wherever we come across one of the old houses where these have been supplanted by modern thin slates, an obvious disastrous hole in the line of houses is the result. Again, how much of the charm of the pattern old English villages is (one must say almost was, so fast are they disappearing) due to their thatched roofs, which look always the better the neater and trimmer they are kept. The same thing may be said of numberless little buildings in the various districts of England, such as Yorkshire, Derbyshire, Northamptonshire, Gloucestershire and the western parts of Oxfordshire and Berkshire, in which stone slabs or beautiful stone slates were universally used till about sixty years ago; many of these farmhouses, cottages and barns, &c., being quite destitute of any ornament, but unfailingly beautiful because of the material of their roofs.

In many other pages we discover no less pleasing reminiscences. MORRIS believed with TENNYSON that "knowledge

is but what we see," and we find enough evidence of his patient research after ancient examples which he considered would be useful to him as an artist and a manufacturer. The paper on the "History of Pattern Design" is really what the title indicates, and a volume could be made out of the information it contains. This fulness of material is seen in several of the papers, although the descriptions may suffer by the introduction of passages which relate to his projects of reform. WILLIAM MORRIS, too, as became a modern poet, was given to pessimism. He will describe the fine works of past ages, and then will conclude by saying there is no use in thinking about them, for they were adapted to a different state of society. He winds up his lecture on textile fabrics by saying that, although he was a maker of would-be pretty things, he advised his hearers to have few of them. The finish of his lecture on the revival of architecture announces that the few examples which he considered deserving of admiration were "mere eccentricities with which the public in general has no part or lot," and that we should be satisfied to wait "for what must be the work, not of the leisure and taste of a few scholars and authors and artists, but of the necessities and aspirations of the workmen throughout the civilised world."

There are readers who can enjoy the socialistic speculations of WILLIAM MORRIS equally with his explanations of the art of past ages. But for those who believe they have no mission to direct the world and compel it to revolve in a different sort of groove, there is much which will be found delightful reading. His verse is more characteristic of the man than his prose; but without being "finical and nice in the use of words," to use an old critical expression the prose is as excellent Saxon as has been produced since the days of COBBETT, who also wasted literary skill on schemes of reform.

## MODERN BOILER-HOUSE PLANT.

By F. J. WARDEN-STEVENS, A.M.I.M.E., A.M.I.E.E.

THE question of steam-raising plant is of considerable concern to architects in connection with new buildings such as hotels, institutions, offices and residential flats, and it is the writer's intention to bring forward the importance of this matter. The boiler, &c., plant found in such buildings is frequently far from desirable, but it is to be hoped that most architects realise the importance of expert engineering advice with an engineering matter such as this.

In designing boiler-house plant it must be clearly remembered that the first cost is not the only consideration. The engineering arrangements should be such that the working and maintenance expenses, together with the interest and the depreciation charges on the capital invested are a minimum; capital outlay may be curtailed at the expense of efficiency, or, on the other hand, the capital charges may more than counterbalance the saving due to the efficiency of the plant, so it will be easily understood that each case must be carefully considered as to the conditions of working, and no standard can be adopted applicable to every case. It has been ably brought forward by the American Institution of Architects (the paper relating to the matter having been referred to in this journal) that it is necessary for engineers to be employed in connection with the engineering work of large buildings. I therefore now propose to deal with the different steam generating and using plant applicable to a building such as before mentioned, and it will be my aim to indicate the considerations which require careful reflection by an expert in order that a proper decision may be arrived at.

In most large buildings the following plant is generally required:—Boilers, heaters (for hot water and heating), pumps (for boiler-feed water, fire purposes, &c.), pipework and in some cases engines.

Now it is not generally the best practice to adopt any one particular type of boiler, heater or pump, because it may have been used in other and perhaps quite different cases. In almost every instance circumstances vary—for example, the hardness of the water available, the conditions of demand for steam, the class of coal best obtainable, the degree of smokelessness necessary (in connection with the chimney) and the space available for plant.

Even the particular sizes of plant required have been decided on occasions by a mere question of guesswork when



an intimate knowledge of the subject has not been available. The positions adopted for the placing of the plant sometimes show very plainly that the matter has not been looked upon as an important detail, and probably only thought of seriously when other matters were settled. In consequence the boiler-house is frequently found in some corner better suited for a coal cellar or other such purpose. It is to be regretted that generally the importance of the boiler-house plant is not fully realised by the owners until the buildings are inhabited. This is, plainly speaking, the difference between the position of the architect and the consulting engineer. The former has in his legitimate work little or nothing to do with financial considerations; he does not generally have to make a hotel or office-building undertaking a financial success. It may be allowed that usually he has to consider how he can incur a certain expenditure in providing a building for a certain purpose to the best advantage. It is not his concern to any extent what the cost of the upkeep will be: his only maintenance expenses are mere depreciation, and in consequence he is not accustomed to economical working of pumps, boilers or lifts.

I have recently had to advise on the pumping for water-supply and working lifts, and also on the hot water and heating in a very large block of residential buildings with a view to more satisfactory and economical working, as the expenditure for this was over 1,500*l.* per annum.

The position to be occupied by a boiler and pumping plant deserves more than passing consideration, and it is to be hoped that architects will consider this point. There should be ease of access and egress for plant. Often I have found that the walls of the boiler-house have been built or rebuilt after the plant has been fixed, thus rendering it necessary to demolish brickwork to remove a boiler. The coaling arrangements should be one of the first considerations; in some cases which have come under my notice it would have been easy to arrange for the coal to be conveyed direct from the street into the bunkers if a reasonable position had been assigned to the boiler-house, but frequently it is necessary to carry the coal down corridors to the bunkers. Further, there should be ease of extension; arrangements are frequently such that any extension becomes a matter of great difficulty and expense, and it should not be overlooked that extension must be necessary in these days of increasing use of power for all purposes in a building intended to last even, say, fifty to one hundred years.

Coming now to the actual details of plant it is impossible to lay down rules on this subject, but a little may be said on the respective merits of various types.

**Boilers.**—There are numerous types of boilers—Cornish, Lancashire, marine, dryback marine, locomotive and vertical amongst the fire-tube class, and the water-tube class also comprises several types of vertical and horizontal boilers. Usually the water-tube type of boiler is not very suited to the conditions existing in public or large buildings, except there is an irregular demand. Of the fire-tube class the various types are referred to in the order in which they should be considered. The Cornish and Lancashire boilers are suitable for steady 24 hours' use, and where space permits they are generally advisable; but as to which is adopted depends upon the output necessary. They are not greatly damaged by hard water, or, more correctly, they are easily cleaned. The great disadvantage is that these boilers must be shut down for two or three consecutive days for cleaning, and therefore must be in duplicate where steam is required continuously. A point most frequently overlooked is that a feed-water heater or economiser in the main flue should be used with these boilers to insure economy. The various marine types are suitable generally for the class of work under discussion, but an ordinary marine boiler is usually of too large a diameter for use where there is little headroom, and in these cases the dryback marine type is available. The feed-water must be soft, and if this is not the case naturally a water softener should be provided, which are of various types and need special consideration. These boilers can be fixed quickly, especially the dryback; no settings are required, they occupy little space and give good results, but require care in use. They cannot be trusted if they are to have the usual and unskilled attention frequently given to plant in such cases. Locomotive type boilers are not usually

advisable for the work required in large buildings; it is an excellent type for a locomotive or traction engine as it is a quick steam raiser and occupies little space. It is, however, difficult to clean, not very efficient and produces a considerable amount of smoke. Its low first cost is attractive, but this usual temptation should be resisted, except in cases where required only occasionally or irregularly in use. The various forms of vertical boiler cannot here be discussed in detail; suffice it to say that they vary considerably, and they are not always to be judged by price. A vertical boiler should, however, be used in preference to a locomotive type for heating work.

**Pumps.**—Feed-water pumps and pumps for lifts, increasing water-pressure, &c., offer a very wide field of choice. The hours of use per annum, together with considerations of reliability, determine for the engineer the type of pump suitable. The duplex direct-acting pump is trustworthy and inexpensive, and for occasional work or as a reserve it is suitable; the steam consumption is, however, excessive. Injectors, if of the very best type, form inexpensive and convenient reserves for boiler-feed water supply. For general use there are several good types of compound direct-acting pumps available, which are both reliable and economical, although more expensive. They are also capable of accurate regulation in some cases, so that they will meet the demand for boiler feed. The ordinary "donkey" pump may be said now to be quite out of favour, as it is chiefly noted for its noise and leakage. The use of centrifugal pumps for low lifts is developing; the improvements that have been made in their construction have increased their efficiency and made them available for lifts of even 200 feet; also they are chiefly beneficial in connection with direct-coupled high-speed engines or steam turbines, and in many cases electric motors. The usual practice of adopting a duplex direct-acting pump for purposes in case of fire cannot be objected to, as they are not required for continuous use, so efficiency is of less importance, providing the boiler power is sufficiently large. There are several arrangements of pumps which can be left always under steam and which keep the pressure up independently of the demand. Should a hydrant be turned on, the pump is at work at once and supplies the requisite quantity of water.

**Engines.**—The best engine is the least expensive, and again, every case requires particular consideration. At present there seems to be a feeling amongst some that any engine will suffice, and that there is little difference what type or make is adopted. The ordinary simple throttle governed engine is often inefficient, yet it is adopted frequently in all sizes for large buildings. It also uses large quantities of oil and takes up much space. The marine type compound engine running at a medium speed is often more economical and better for any kind of general work. The high-speed enclosed engine is useful and should be used when direct coupled to high-speed plant such as dynamos or centrifugal pumps, fans, &c. The steam turbine merits special consideration with such plant by reason of its reliability, high speed and consequent small space, steadiness in running, requiring no foundations and giving rise to no vibration, and, more important still, the cleanliness of its exhaust steam—there being no oil in the steam it can be actually mixed with water for hot-water supply.

**Heaters.**—Almost every large building now erected has a heating plant, if only for corridors, &c., also a general hot-water supply. With a small plant, a vertical boiler working at, say, 30 lbs. pressure, if the building is 60 feet high, will supply steam if required to a kitchen, a steam system of heating for both hot-water supply and for warming, and if necessary it will supply a fire-pump—it will cost less for coal and be less trouble than a circulating boiler. A good horizontal boiler is preferable except in very small sizes, as the economy is better and cleaning is easier. If there is any considerable amount of power required the question of employing exhaust steam to supply the greater part of the heat must be remembered. Heaters are of two types—the mixture and the tube. The former are more economical, as all the heat from the steam is used and scale does not reduce the economy. Where water is required for general purposes these heaters must only be used with exhaust steam containing no oil. Exhaust steam



from pumps or ordinary engines will contain too much oil, and only the exhaust steam of steam turbines can be satisfactorily used in such cases. Of the various tube heaters, one may be better than another in mechanical details, in connection with easy access for removal of scale and in the proper disposition of the heating surface.

*Pipework.*—This most important part of steam and water arrangements in every building generally receives less consideration than it should. The principal pipe runs should be settled before the building is erected, and proper channels left for the same during the construction of the building. This will avoid much cutting away and often will make all the difference in the success or failure of the pipe system. The many buildings where the heating system is a failure should surely bring forward to the architect the importance of the pipework. There can, again, be no standard rule; each case must be treated on its own merits. The question of sizes of pipes, the use of cast or wrought-iron, provision for expansion, the system of jointing, the actual course of the pipes and other points, all matters of discretion and experience, render the expense and success dependent upon the engineer who designs the work.

#### FRANCESCO BARTOLOZZI, R.A.

**A**N extract from the *Times* of November 4, 1802, relates to the departure of Bartolozzi, the engraver, from England. He was over-generous in disposing of his money, and in 1802 he was glad to accept the appointment of superintendent of the Lisbon Academy. King George III. then offered Bartolozzi a pension, but it was too late, for he had left on November 3. The *Times* said:—

This celebrated engraver left our metropolis yesterday morning in order to proceed to Portugal. It is much to be regretted that an artist of such eminence, and whose talents have so long done honour to this country, should have been compelled in the decline of his life to have sought an asylum in any other—yet we have nothing with which to reproach ourselves on his account; the efforts of his genius have been rewarded with the liberality which uniformly distinguishes the English nation, and if imprudence has lavished what generosity has bestowed, it is a subject of regret that splendid talents should be unaccompanied by common prudence. The fact is, Mr. Bartolozzi has suffered himself to be too much imposed upon by his own countrymen, who have taken advantage of his easiness of temper and his carelessness with regard to his affairs. Thus, although he has acquired what might have been an independent fortune, he has neglected to preserve it; and to secure tranquillity and comfort to his latter days he has accepted the offer of the Government of Portugal, and has consented to pass the remainder of his days there, upon what in this country would be deemed a very moderate pension. We understand that a national academy of arts is to be established at Lisbon, of which Mr. Bartolozzi is to have the superintendence. He is to be attended by two pupils from this country. A handsome suite of apartments are to be assigned him, and everything else provided for him at Lisbon, independent of his salary, which is little more than 200*l.* sterling a year. He purposes before his final departure to pass a few days at Bath. We cannot avoid observing that if the state of Mr. Bartolozzi's fortune is such as to require the aid of a patronising Government, it would be a gratification to every Englishman that he should have been indebted for that assistance solely to the country of which he has so many years been the ornament.

If, however, his departure is a matter of choice, we sincerely wish he may meet with encouragement equal to what he has experienced from the British nation.

Bartolozzi remained in Lisbon until his death in 1815.

#### RELATIVE PERMANENCE OF STEEL AND MASONRY CONSTRUCTION.

(Continued from last week.)

**E**UGENE W. STERN, M.Am.Soc.C.E.—Discussing this question from the standpoint of the protection of iron and steel construction in buildings, the experience of the speaker is that iron does rust in buildings. That is, it rusts unless properly protected. Therefore it is a very important question to determine what kind of protection it needs to prevent this under different conditions of exposure.

In the interior of buildings, where there is no chance o

moisture or acids attacking the iron, and where it is usually surrounded by fireproofing materials, the danger from rust is very slight. The usual coat of paint appears to give all the protection necessary.

The speaker has seen ironwork taken from the interior of buildings, in one case after thirty years, in which the shop-marks of white paint and the brown coat of red-oxide paint were in as perfect condition as if done but recently.

In the exterior walls of a building, however, and in the roof and cellar construction, it is an entirely different matter. A driving rain will go through the outer coating of brickwork; roofs will somehow or other leak, and cellars rarely are absolutely dry. The speaker has invariably seen evidences of rust on the ironwork taken from the above-mentioned positions in comparatively recent buildings. The paint seemed to have disappeared entirely in many cases where exterior brickwork was laid up against the iron. Where the mortar was in immediate contact with the iron there was no rust; where the brick was directly in contact there was considerable rust.

In a building in New York city, built in 1869, and now being taken down, cast-iron girders supporting the brick arches of the side-walk construction were rusted about  $\frac{1}{8}$  inch where the brick was immediately in contact with the iron, but where the mortar was directly in contact the iron was perfectly clean and black, looking as if taken from the sand only yesterday. The evidence that paint protects ironwork thus exposed for any length of time is not forthcoming. The paint seems to disappear entirely in a few years. Nor in the speaker's opinion does it help matters to prepare the surface of the ironwork prior to painting, in the most painstaking and thorough manner, even using the sand-blast to remove the mill scale. Some of the paint is rubbed off the ironwork during erection, notwithstanding that the very greatest care is used. It is an inseparable condition, from the nature of the work, that this happens. There is then a starting-point for rust, and this will follow more quickly on a sand-blasted surface than on one having its mill scale.

The speaker is strongly opposed to the use of the sand-blast on ironwork for buildings. It does not help to protect iron permanently, and the expense therefore is not justified. For this reason the following method of protection is recommended:—All the columns and girders in the exterior walls, the roof, the cellar and wherever exposed to moisture or acids, should be surrounded with Portland cement mortar, and the bore of the columns in such locations should also be filled solid with this mortar.

Broken stone in the mixture is not recommended, because the voids may not always be filled, and cinders are strongly objected to because there is good evidence to show their very harmful effect.

A building having its frame thus protected should remain structurally sound, judging from evidence, for many years, perhaps longer than one made entirely of masonry, unless of the best quality.

George F. Swain, M.Am.Soc.C.E.—People in general have come to consider iron or steel as rather perishable materials when compared with stone. Many persons form this idea by considering the old stone structures of the Greeks and Romans, notwithstanding the fact, referred to by one speaker, that there are a great many stone structures which have proved very perishable. Many instances can be cited of bridge-abutments built of sandstone or limestone which have practically gone to pieces within thirty or forty years. In judging of the ancient stone structures of Greece or Rome, we must also remember the difference in climate between those countries and Northern New England. It may not be out of place to point out also some differences between the ways in which steel and stone structures act. A stone structure is a comparatively simple one; it acts by its own weight, it acts generally in simple compression; its durability is a question of stability rather than of strength, and the loads may generally be increased greatly without endangering it.

A steel structure is very different. It is a complex structure, involving complicated stresses and strains; its strength is a controlling factor in its durability, and any increase of load reduces correspondingly its margin of safety. Engineers who have had much to do with questions of renewing bridges will agree with the speaker that cases in which bridges have had to be renewed on account of the actual wearing out of the material are comparatively rare. Of course, there are cases where corrosion is active, especially in bridges over railroads, but, leaving out such cases, the greater number of renewals which have taken place are due to other causes. One of these is defective design. Engineers are learning more and more every day in regard to the details of steel structures, and they are experimenting and studying the various connections and details. The result is that we find that structures built twenty or thirty years ago, and supposed to have an ample factor of safety, really had a much smaller factor. Moreover, as everyone knows, the loads to which steel structures are exposed have increased enor



mously. These are the two elements which have caused the principal renewals of bridge structures. These elements will continue to be present, and as long as they are present we cannot hope to have steel structures in general as durable as the best stone structures would be. In the case of a steel-frame building the loads, presumably, are not to change very much, and with good design the actual durability of the material should govern the life of the structure. As to what that durability will be seems very uncertain. All the engineer can do is to take every precaution he can to insure the permanency of this steel. The speaker agrees with Mr. Stern that the steel should be completely enclosed in concrete, but even under these conditions he does not think the steel will last as long as the best masonry.

Charles C. Wentworth, M.Am.Soc.C.E.—The answer so far given to this question is that steel when embedded in concrete to a sufficient depth is permanent. A structure in which the steel is thus hidden becomes at times essentially as one built of concrete as of steel, and may be even more so. The fact that in most cases it is impracticable to adopt a composite construction rather than one all steel or all concrete, renders it still necessary to seek a more complete answer to the question, especially if it be considered, as it must be, that bridges are made of "building material."

The answer given, for instance, is inapplicable to the East River bridges built or building in New York city, and to the greater part, by weight, of ordinary railway bridges. It is surely inapplicable to more structural steelwork, by weight, than it is applicable to all kinds.

The protection afforded by concrete is afforded by paint, but in a less degree. The objection to paint as an answer to the question lies in the fact that much structural work is inaccessible after erection, and that in all likelihood paint will not be applied properly or with sufficient frequency even where the work can be reached by the painter.

A more complete answer to the question appears to lie in the electro-plating of structural steel with copper or aluminium. This has already been done to a small extent, but the subject does not appear to have received the attention it deserves.

The speaker sees no reason why such plating need be of excessive cost. Aluminium is an exceedingly abundant element, and is becoming cheaper; copper may retain its value. Metallic aluminium may not be needed in the process, but such aluminium salt as will serve when in solution as the source of the metallic aluminium finally composing the plating.

Of course it would be impracticable to plate steel as it comes from the rolls, as rivet-heads and sheared edges would need subsequent plating, but each structural piece ready for shipment and erection in the structure could be plated, and the details of field connections arranged with a view to their permanency on the same lines.

The speaker does not wish to appear as objecting to the use of concrete structures stiffened by steel with the incidental protection afforded to the steel by the concrete. Such structures are entirely proper and appropriate in very many cases; but in conclusion he wishes to say that the plating of structural steel, as a more general answer to the question, is well worthy of the attention of the members of this Society.

Oberlin Smith, M.Am.Soc.C.E.—The speaker is not experienced in putting up big steel buildings, but it seems to him that a certain precaution should be taken, which, perhaps, usually is not and which will be mentioned later. Some of these buildings have been up a good many years and seem to be very strong, but after this generation is gone—fifty or one hundred years hence—if there is no way to examine all that hidden metal inside the masonry, how are people going to feel about the stability of such buildings? When will the time arrive for them to come down of themselves? There should be therefore some systematic method of examination.

Of course, after many years, the owners may tear out some of the masonry and examine the steel, but it would be a small matter now to provide inspection holes, properly covered, and to differentiate and classify the various conditions of possible deterioration to which the metal may be subjected.

Certain parts of the building which are most likely to rust, and where such rusting is most likely to cause accidents and damage, would be in one class, while other parts which are not so likely to be affected would be in another, and so forth. In every building, in several proper locations, let there be certain places left where the metal can very easily be exposed and again covered up—of course in a fireproof manner. This would be done instead of merely tearing away a building at random, with perhaps considerable damage and with consequent expensive repairs.

To find out how the steel is really getting along, there should be certain times for observation, with definite intervals between. These intervals might be five, or ten, or twenty-five years—as experience should dictate. The most risky "classes" should be examined the oftenest. In general there should be certain definite methods of inspection, and definite places for

inspection, and definite times for inspection of this buried and perhaps much-suffering metal, not only that such may be done with less damage to the building, but that it may be done thoughtfully and systematically, instead of waiting for some Chicago post-office to become obsolete that we may see whether it continued safe until the end. If not done in such a manner all may be neglected, and intervals which are uncertain may become of infinite length.

William R. Webster, M.Am.Soc.C.E.—The examination of many old bridges and other structures has shown that the whitelead marking-letters of the mill are intact, and that the metal is better protected at these places than at others. That is, the plates and shapes are generally marked while hot, and before the material has had a chance to rust; but the full importance of applying the protective coating while the metal is hot has not been appreciated.

The ordinary oiling at the mills has not been satisfactory, as the material is generally made sticky and difficult to handle in the shops. In relation to this, attention is called to a railroad spike dipped in oil while slightly heated (in accordance with the specifications for an export order). Under this treatment the oil quickly dried and formed a good hard protective coating. This process might be applied to ordinary structural shapes and plates with great advantage; the material being cleaned with brushes and an air blast, and the oil applied while the material is still hot, the coating in no case being heavy enough to interfere with a thorough inspection for surface defects. The shop painting, of course, should be applied in the usual manner.

James Owen, M.Am.Soc.C.E.—It might be interesting to know that, in endeavouring to find some records of the strength of concrete beams, the speaker found in the library of the Society the report of some experiments made by Mr. Kirkaldy in 1854. Mr. Kirkaldy at that time had made an elaborate investigation of the strength of the admixture of concrete with iron rods and iron wire. Results showed at that time that the strength of the combination of the two materials, iron and concrete, was increased by more than two and one-half times that of the simple concrete itself. This is quite in accord with the present experiments in that line, and it is interesting to note that while these investigations were made so many years ago, it is only of late that the profession has appreciated their importance.

The speaker had a peculiar experience in relation to the strength of an ordinary bridge built with iron beams and brick arches and covered with concrete. The span was 15 feet. The bridge had been built some eight or ten years when the local engineer decided to change the grade of the street, and raised it about 6 feet. This alteration imposed on the bridge itself an extra load of 900 lbs. per square foot. That, with a previous allowance of 200 lbs., made a total of 11,000 lbs. The bridge was originally designed for a live and dead load of 300 lbs. and a factor of safety of four. A critical examination of the bridge, after the extra load had been on about six months, showed no rupture of any kind and no apparent deflection. The bridge is still in use.

It may be presumed, therefore, that the combined use of steel and concrete is susceptible of a great deal of further development, and that its ultimate strength is apparently unknown.

E. T. D. Myers, jun., M.Am.Soc.C.E.—During the summer of 1901 a rifle-barrel was pumped up through the 20-inch pipe connected with the centrifugal pump which was used in dredging out the historic dock immediately in front of Libby Prison. It arrived at the usual joint, just in front of the pump, which was intended to stop obstructions too large to pass through the pump. The pump was stopped and the rifle-barrel taken out. It was found that the blue enamel on the barrel was intact on at least 90 per cent. of its surface, and the sight could be raised and lowered without the slightest difficulty. The date on the barrel was 1856. It was probably thrown in the water in 1865.

The water there is fresh and is entirely free from lime. It is what is known as a "kind" water for boilers. The speaker does not know whether metal would last that way in other waters, but he has pumped up and dug up shells and rifles which were not rusted.

The depth of water in the dock was originally 16 feet, and the depth of the silt was about 4 feet. The pump was working at a depth of 22 feet. It is impossible to state the depth at which the rifle lay, but it probably came from the 16-foot level. The bottom is composed of sand and gravel, and the silt lying upon it came from the James River, which runs through a red-clay country. The rifle-barrel therefore had about 16 feet of mud and fresh water above it.

The speaker does not feel competent to discuss this topic, but he is deeply interested in it, and hopes that the result of the discussion will be the addition of much valuable information.

(To be concluded.)



## NOTES AND COMMENTS.

THE construction of Vauxhall Bridge, as originally proposed, would have been an interesting experiment. It was intended to have the visible parts of granite with a filling-in or hearting of concrete. There has been a change of engineers, and the present holder of the office has demurred to the carrying-out of openings of 70 feet wide with a clear headway of 18 feet and 15 feet, according to the position. To make any alterations in the superstructure would be to depart from the clauses of the Vauxhall Bridge Act. A report was prepared accordingly by the bridges committee on different methods of dealing with the difficulty. The following recommendations represent the conclusions:—“(a) That the resolution of the Council of February 22, 1898, directing that the new Vauxhall bridge be a granite bridge backed with concrete be rescinded. (b) That the estimate of 170,000*l.* submitted by the finance committee for the building of the superstructure of the new Vauxhall bridge be approved, and that an expenditure up to the amount be sanctioned; that the design submitted showing a steel elliptical arch structure be adopted, and that the engineer be instructed to prepare the necessary plans and specifications.” This is a return to one of the original projects which it was judged desirable to abandon. A steel bridge will not have as imposing an effect as one of granite, but it is not likely that people will wait for several more years while a discussion on the relative merits of metal and stone goes on, for the new bridge is urgently required.

LAWYERS who have been unfavourable to the principle of arbitration when the judges are not barristers will be amused at the incident which arose in the King's Bench Division on Friday last. Messrs. KIRK & RANDALL, whose experience in carrying out building contracts is most extensive, are erecting a theatre for Sir CHARLES WYNDHAM. A dispute arose between the parties to the contract. In the deed there was a clause which enjoined that disputes, if any arose, were to be referred to an arbitrator who was named; or failing him, to another, likewise named. Messrs. KIRK & RANDALL found that arbitrator No. 1 was unable to act as he was about to leave town, and the circumstances were referred to arbitrator No. 2, who held in their favour. Sir CHARLES WYNDHAM in turn submitted the case to arbitrator No. 1, who had returned, and whose decision was to the opposite effect of the first—*i.e.* in favour of the building owner. Both parties endeavoured to obtain a decision of the Court. Counsel for Messrs. KIRK & RANDALL appealed for permission to have a brief discussion on the arbitration clause, as, although the works were going on, payment for them could not be made. The case is not common, for arbitrators generally are prepared to meet difficulties without loss of time. Their Lordships declined to interfere, and we think this ought to be taken as a suggestion that the parties to the contract should settle their differences out of court.

THE erection of M. GINAIN's new school of medicine has produced a transforming effect on that part of Paris in which the old buildings were situated. Four houses in the Rue l'Ecole de Médecine have survived, but they are doomed to demolition. The street was closely connected with the history of the French Revolution. One of the first acts of the new Government was the suppression of the monastery of the Cordeliers, a branch of the Franciscan order. The site was utilised for a medical school, and the refectory afterwards became the Musée Dupuytren. It was in the church the meetings of the “Club des Cordeliers,” founded by CAMILLE DESMOULINS, were held. The ancient Rue des Cordeliers became in 1790 the Rue de l'Ecole de Médecine. In No. 20 MARAT lived on the first floor, and there was assassinated by CHARLOTTE CORDAY. Afterwards the street was known as the Rue Marat. At No. 25 lived a grocer from whom the terrible veterinary surgeon obtained the paper on which he wrote his articles demanding the execution of all who were supposed to be aristocrats.

## ILLUSTRATIONS.

THE CLOTHWORKERS' HALL: THE GREAT HALL.

THE Clothworkers cannot be considered as forming one of the most ancient companies of London. Their incorporation was in 1482, while other companies can

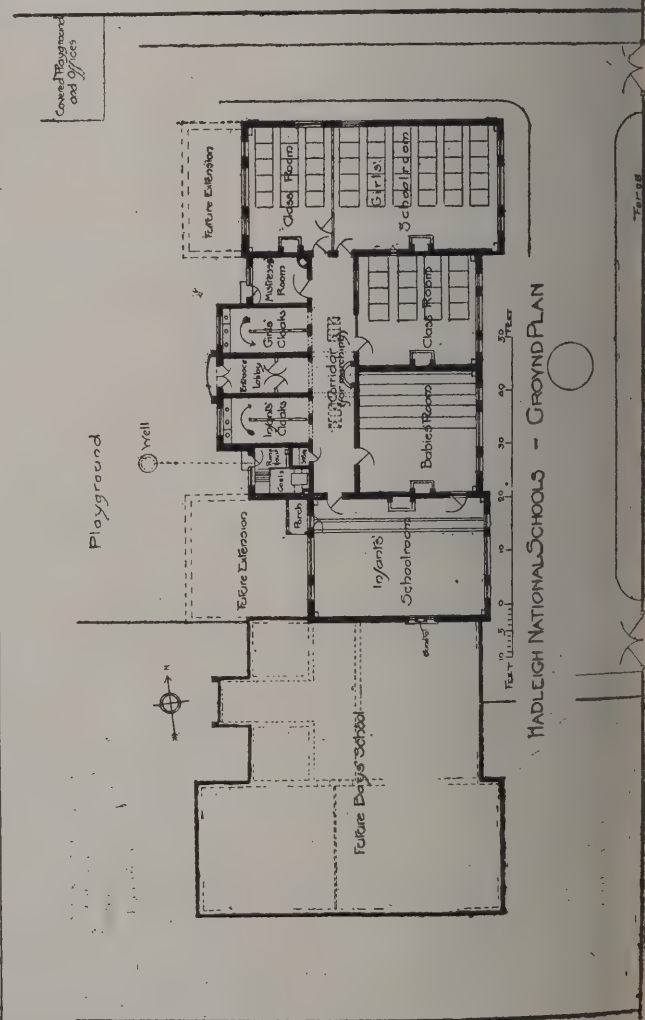
claim to be at least a century older. The Clothworkers seem to have been derived from the Drapers and Merchant-Tailors, the latter having received a charter in 1300. Originally the title was “The Fraternity of the Assumption of the Blessed Virgin Mary of the Shearmen of London.” Queen ELIZABETH reincorporated the members under the title of Clothworkers. Another company known as the Burrillers or Clothdressers existed from an early date, and the charter was confirmed by EDWARD III. The origin of the livery companies cannot be determined. Some investigators have supposed they were to be found in Roman London, others discover an Anglo-Saxon origin for them, but the general opinion is that they originated either in the desire of neighbours to meet together in order to escape the monotony of ordinary life, or that they were derived from guilds or confraternities, which seem to have been an established institution in Catholic churches.

## HOUSES AT BERKHAMSTED.

THESE four houses have just been completed on the King's Hill Estate. Owing to the site sloping sharply towards the south-east the houses are made as narrow as possible from front to back in order to save expensive excavation. The sitting-rooms are placed as far as possible to the front on account both of aspect and prospect. The materials are grey local stock bricks with Leverstock quoins; the whole of “Ty-Gwyn” and the upper parts of the other houses are covered with cream tinted rough-cast on the brickwork; the roofs are covered with Marston (Bedford) tiles. Messrs. NASH, YOUNG & HORNE were the builders of “Ty-Gwyn,” “Lindum” and “Braeside,” and Messrs. R. JONES & SON of “Elmcot.” Messrs. MARSHALL & BRADLEY, of Westminster, are the architects.

## THE BAR: TROCADERO RESTAURANT.

WEST FRONT: NATIONAL SCHOOLS, HADLEIGH, SUFFOLK.



CATHEDRAL SERIES: HEREFORD. THE CLOISTERS AND THE LADY ARBOUR. THE VICARS' CLOISTERS.



## ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE first meeting for the session 1902-3 of the Institute of Architects was held on Monday evening last at 9 Conduit Street, W., Mr. Aston Webb, A.R.A., president, in the chair.

The hon. secretary announced the decease of the late Mr. W. Salway, of Melbourne, elected Associate 1874 and Fellow 1885; Mr. George Truefitt, elected Fellow 1860, and placed on the list of retired Fellows in 1899; Mr. Charles France, of Bradford; M. Emerich Steindl, hon. corresponding member, elected 1894; and M. Eugène Muntz, hon. corresponding member.

It was announced that a statutory examination of candidates for the offices of district surveyor and building surveyor was held on October 23 and 24. The following candidates passed, and have been granted by the Council certificates of competency to act as district surveyors in London:—Mr. W. G. Perkins, and Mr. A. Halcrow Verstage.

The President said the Edinburgh Architectural Association had applied for an alliance to the Royal Institute of British Architects, and it was his pleasure to make known that the Institute do admit to alliance therewith under the provision of section xvii. (by-laws Nos. 77-81) the following Association, viz. the Edinburgh Architectural Association.

The PRESIDENT then delivered

## The Opening Address.

He said:—Colleagues, Ladies and Gentlemen,—Since our last meeting in this room two events of national importance have taken place—the dangerous illness and marvellous recovery of our Sovereign the King, and the Coronation of the King and Queen in Westminster Abbey on August 9, an event attended by all the splendour of the ancient rites and ceremonies which tradition has handed down to us as fitting for such an occasion; and it seems but right that the first words of the President of this Royal Institute should be to express on behalf of its members their thankfulness for this happy consummation of their hopes and aspirations.

My next words must be to thank you for the honour you have done me in placing me in this chair, an honour which carries with it many responsibilities, which I shall do my best to fulfil; but whether I succeed or not, I will ask you to believe that I am actuated solely by what I consider to be the best interests of architecture and of this Institute, in which I have always been a firm believer.

I am aware that my task is not made the easier by the admirable manner in which these duties were performed by my friend and immediate predecessor, Sir William Emerson; and I am glad to take this opportunity of publicly congratulating him, on behalf of the members of this Institute and myself, on the high honour of knighthood conferred upon him by his Sovereign, an honour which has given much pleasure and satisfaction to all of us, the more so that it is, I believe, the first time that a President of this Institute has been so honoured.

It is now my duty as your President to notice, as concisely as I can, some of the questions on the art and practice of architecture and the affairs of this Institute which present themselves to us at the present time, and in doing so I will ask you to understand that I in no way lay claim to any special fitness for this task, but that it is merely through the fact of my present position that I am privileged to do so.

On looking back over the last ten years I think we may fairly congratulate ourselves on the progress this Institute has made, the position it has attained, and, more important than all, the work it has done during that period. Ten years ago we had 1,400 fellows and associates; now we have nearly 1,700—not perhaps so large an increase as we could wish, but still a considerably larger increase than in the previous ten years.

It is true that our register still lacks the names of some distinguished architects whom we should like to see there, and whose presence would strengthen our power for good, not only in London, but throughout the country. Many of them we know to be well-wishers of this Institute and to appreciate the work we are doing; I can only say we should greatly value their presence amongst us, and should give due weight to their opinions on any matters in which they may consider that the policy of this Institute could be made increasingly useful in the interests of architecture.

Within the last few weeks we have been much gratified to receive a proposal for alliance from the Edinburgh Architectural Association, which you have ratified this evening. This Association has hitherto held somewhat aloof from us, and we shall, I am sure, all welcome the accession to our ranks of so earnest and able a body of architects, numbering many men who are really enthusiastic and doing good work, and though the distance between us is great, I hope we may not infrequently have the pleasure of welcoming some of their members amongst us here and that the alliance may prove of advantage to both societies.

It has often occurred to me how little we know of the proceedings of our allied societies, their aims and the matters on

which they feel most strongly, and that anything that would bring us more into touch with them would be a mutual advantage. With this view, one naturally turns to the Journal, so ably conducted by our secretary, Mr. Locke, and there we find our noble selves fully reported in all the glory of large print, but not much space given to the proceedings of our allied societies; and it appears to me that if that space could be increased, a portion allotted to each society, and if the societies would help us by sending up reports of their papers and discussions, we should all get to know a great deal more of what is going on in the country, and become more familiar with the men who are taking an active part in each society's affairs, while the information thus given would greatly widen the interest of our Journal. The addresses of the local Presidents could be printed, together with other papers and discussions; and these could, if so desired, be printed separately and issued to the members of the local society concerned, and thus each society could obtain an independent Journal of its own proceedings at a very moderate cost.

While on the subject of the Journal, I may say the editor would be very glad to receive communications from members which would add to the interest of the Journal, not only from Fellows, but also from our younger members.

The president of the Architectural Association of Ireland (Mr. F. G. Hicks), in his opening address the other day, said, speaking of his Institute, "It isn't a bit up to date, and there seems very little cohesion among the members, for they seldom have an opportunity of meeting." Well, I have heard something of the same sort applied to this Institute, that there is a lack of opportunity for members to meet and know each other, and I propose, with the permission of the Council, to give one or two informal "At Homes" here during the session, at which possibly smoking may be permitted (to bring us "a bit up to date") and where members may meet in a friendly way and get to know each other better, and I cannot help thinking that, if you will support me by your presence, some good may be done in this direction.

The admission of Fellows to this Institute can hardly yet be said to have arrived at a final and satisfactory settlement, and in my opinion this will not be done until Fellows are elected solely from the ranks of the Associates, except in very exceptional instances. But there are at present a large number of practising architects we wish to see Fellows whom we cannot expect to submit to our examinations. This is a matter which will have to be once more considered by your Council, more especially as the provision for the direct election of Fellows lapses in May next.

The financial position of the Institute is, I am glad to say, satisfactory. Ten years ago we had a capital of 5,800*l.*, now we have a capital of 11,500*l.* Then our revenue hardly balanced our expenditure, now it exceeds it by something over 1,000*l.* per annum.

It is obvious that this increased prosperity lays upon us the obligation of increased activity, for we are not a Society to accumulate funds, but rather to make proper use of those our increased prosperity supplies us with.

The question of premises is one that is always with us, and the increase of our office work and that of the library is beginning to make it a very pressing one. In many ways our premises here suit us well enough, but we now occupy the whole of the building, with the exception of the galleries, &c., on the ground floor, which we unsuccessfully negotiated for on behalf of the Architectural Association and ourselves in 1896. Failing these galleries, our power of expansion here has come to an end, and the alternative is to build premises elsewhere. This raises the question of a site, which I mention now, as it is possible some of our members may know of something likely to suit our requirements, and, if so, we should be glad to receive from them any information or suggestions on the subject.

The Council, on the suggestion of the finance committee, have started a premises fund, and have placed the sum of 1,000*l.* to this account.

A cause which I think this Institute should as far as possible assist is that of architectural education. The Institute, as an examining body, has deliberately left the education of architects to other architectural societies; and in this I think they have acted wisely, for the undue multiplication of educational centres is obviously undesirable. The Royal Academy has an excellent architectural school, visited and instructed by architects, but does not undertake very elementary work and deals with design only. The Architectural Association has recently started a day school, dealing with elementary work, and worthy of every encouragement. It is a scheme which, I venture to think, this Institute would do well to foster by every means in its power, both financially and otherwise, while individual architects could also do much to assist it by advising parents to send their sons for one or two years to the school previous to their being articulated to them.

These two schools at the Academy and the Association do to some extent overlap, and if a certain course at the Associa-



tion schools could be recognised as giving entrance to the lower architectural school of the Royal Academy, much in the same way as certain work at the public schools will admit a man to the University of Oxford, subject of course to any conditions that might be thought desirable, a great impetus would be given to both schools, and architects might at last feel that the education of the next generation was in a fair way to being placed on a satisfactory footing that would be capable of great development. There is, I think, no worthier or more unselfish object for this Institute to promote, or one that is more likely to influence architecture for good than the careful and systematic education of our young men, by a system which will not supplant the present system of apprenticeship, but will rather supplement it by supplying that which cannot be learned in an architect's office, or at least can be better taught systematically in a school.

Our examinations are, I believe, proving of real use to the younger men, and, judging by the increasing number that enter for them, they are fully appreciated. Ten years ago 305 went up for these examinations, while last year there were no fewer than 674.

The real benefit of these examinations is the work required in the preparation for them. We do not claim that they necessarily turn out artists (these are born, not made), but we do claim that, with the knowledge thus obtained, it enables those who are gifted with the artistic instinct the better and with the more certainty to realise their imaginations and aims. It is an object for a young man to work for and an inducement for him to acquire knowledge in some branches of our complex art which, though very necessary for its proper realisation, are apt to be neglected as uncongenial. In connection with this matter may I venture to hope that architects will give all reasonable facilities to those under them to undergo the necessary preparation.

The question of competitions is one of those questions that are always with us, and as long as architects see fit to enter for competitions it is plainly the duty of this Institute to do what it can to secure—first, the drawing up of such conditions as shall be fair to both parties, and at the same time not entail more labour on the competitors than is necessary to enable a competent assessor to arrive at a just decision; and secondly, to secure the adoption and execution of the best design.

With this end in view a series of suggestions for architectural competitions was drawn up by this Institute in 1881 and reconsidered and revised by the Council during the last session. These have recently been sent to all public bodies likely to organise competitions, in addition to which a copy is always sent to the promoters of a contemplated competition as soon as it is heard of by the officials of this Institute. But when all this is done there still remains the question of the appointment of the assessor, a matter of supreme importance both to the promoters and the competitors. Ever since 1881-82 architects have insisted that a professional adviser should be appointed in all open competitions, and in many cases the President for the time being of this Institute is asked to nominate the assessor, and after some inquiry into the matter I can find but little objection taken to the selections made or to the decisions given, bearing in mind, as I well know by experience, that the decision can seldom be thoroughly satisfactory to more than one of the competitors. It has been, however, urged by some that the selection of the assessor should be made by a small committee, rather than by the President, and that two or more assessors should be appointed in all competitions of any size. Personally I do not share this opinion, believing that the sense of individual responsibility is likely to give better results in both cases.

How far the system of selecting an architect by competition for the erection of any building is a desirable one will, I suppose, always be in dispute; but that it gives an equality of opportunity to all architects, great or small, known or unknown, is, I think, indisputable, and it has always seemed to me one of the strongest points in its favour, for we all could name men now doing excellent work whose first opportunity came by competition, and we know in this crowded world of ours how difficult it is for new men to obtain a hearing.

Before leaving matters more especially connected with the affairs of the Institute, I should like to say a word on behalf of the Architects' Benevolent Society. There are so many who faint by the way, and to whom a little temporary assistance is of untold value; there are so many others who have been worsted in the battle, and through ill-health and other difficulties have fallen out of the ranks, that great demands are made upon the funds of this Society. It is surely our duty to provide for them without going outside for help. Mr. Macvicar Anderson last year raised in a short time over 1,000*l.* with this object, a very handsome and most acceptable addition to the funds; but interest is very small now, and the cost of living very high, and the income of the Society still wants largely increasing. The Council of this Institute for the first time have voted an annual contribution of 20*l.* and there would be nothing pleasanter than to see the number of annual

subscribers largely increased during the present year. At present out of 617 Fellows only 191 subscribe, and out of 1,066 Associates only 70 subscribe. I venture to think that this ought not so to be.

And now, gentlemen, if I have not already worn out your patience, I will ask you to consider some questions of wider architectural interest than those we have been considering.

The interests of this Institute are with both old and new buildings.

Our interest in old buildings is to trace the history of their origin and growth, and to devise means for their maintenance and necessary repair.

The fall of the Campanile at Venice forcibly reminds us of the necessity for continual watchfulness as to the structural stability of ancient buildings, and the engineer's report on the foundations of our own St. Paul's still further emphasises the fact; and while these instances by no means justify undue interference or rebuilding of these structures, they show the danger of endeavouring to hand them down to posterity in exactly the same condition as we have received them. Most of the members of this Institute will, I think, sympathise with the desire of the Italians to re-erect their fallen tower, and be pleased that the Royal Academy has taken the lead in showing the practical sympathy of art-loving England with Italy in her loss. But how much better, by careful maintenance and judicious repair, to avoid such catastrophes.

In the case of St. Paul's a note of warning has been sounded apparently none too soon, and we look to the guardians of that great pile to take every precaution, on the best possible advice, to insure its safety, appealing to the Government for funds, should that be necessary.

But there is another and even greater danger threatening the buildings and antiquities of the kingdom which would rob us of much that gives this old country its charm. It is, I am afraid, a more subtle danger, and therefore more difficult to deal with. I mean the wholesale depredations of the "art" dealer.

I am informed on reliable authority that certain districts in this country are systematically mapped out by these gentlemen, and anything of interest, such as a panelled room, a moulded ceiling, a bit of ironwork even, a chest or a clock, are all carefully scheduled, the position and means of the owner ascertained, and, as opportunity offers, the property is purchased, the cottage or house often pulled down, the contents sold, generally abroad, and then the land, stripped of its little treasures, is resold. It is difficult to use temperate language about such proceedings; but surely it behoves us before it is too late, in conjunction with other societies, to see if it is not possible to take some united action to get these buildings and fittings registered as national belongings, so that, at any rate, they cannot be removed from this country—a course which, I understand, has already been adopted to some extent in France and Italy. This is work in which other societies are also interested, and we are always ready to act with them as occasion arises; indeed, it interests and affects all educated Englishmen.

It is in modern architecture, however, and its allied arts that our influence is naturally most likely to be exercised, especially at a time of such exceptional building activity as the present.

The Government is largely engaged in the erection of public buildings; local authorities all over the country are busy with the erection of town halls, asylums, schools, technical institutions, &c.; while the buildings, residential and commercial, in our great towns continue to increase at almost an alarming rate. What, I think, must strike most of us in all this activity is that while minute control is exercised by public authorities over the details of these buildings, such little control is exercised over the laying out of our cities that to a great extent they seem to be left to lay out themselves.

How often we see a really noble and costly building hidden away in some inconvenient and cramped site without any approaches worthy of the name, simply because the land was easily obtainable or happened to be vacant at the time; or could be obtained cheaply, or to improve the value of adjoining property; reasons we have heard put forward repeatedly, but nearly always resulting in the loss of a great opportunity of ennobling and beautifying the town; while, instead of money being saved, as is foolishly supposed, money is really wasted and thrown away.

A predecessor of mine in this chair once urged when heading a deputation on the erection of a public building that the extra cost necessary for its worthy completion would, even from a commercial point of view, be soon repaid by the increased attractiveness of the city, and the number of visitors that would be drawn to it. The suggestion was received as if it was not seriously meant; but surely there is force in the contention, though it is but a secondary reason for urging on the public authorities the importance of so placing their public buildings that they may be the ornament and crowning feature of the town.



Why is the National Gallery site so frequently pointed to as an ideal one? Surely because it has, as so few buildings have in London, a slightly elevated site, with a large open space in front of it, and is approached by a main thoroughfare leading directly to its façade. The Royal Exchange has a fine site, for a similar reason. When carefully planned the most splendid approaches to St. Paul's, which would have made the City one of the finest in the world, but the greed and disputes of the citizens unfortunately prevented his scheme being carried out. Most of our public buildings have no dignified approach, and usually a general view can only be obtained in a sharp perspective from the roads which run past them, not up to them, and, as Wren says, they are seen sideways. The matter is of still more importance now that the picturesque manner of the Houses of Parliament and the Law Courts is giving place to a more palatial and formal style. Continental towns set us a great example in this respect, and though we may consider their love of straight avenues and boulevards is often carried to monotony, we cannot but admire the dignified and monumental surroundings they almost invariably contrive to provide for their buildings. I would venture to assert, though it should surely not be necessary, that every public building should be entirely detached, and should stand on a site of an area at least half as large again as the area which the buildings actually cover, and that they should, wherever possible, have a fine road leading up to them. The Americans, who are generally credited with a keen eye for the financial side of a question, are fully alive to this point, and are laying out their cities with great monumental dignity. It seems almost impossible to exaggerate the importance of the architectural surroundings of a building. In the case of private houses some architectural support in the way of steps, walls and terraces is now usually designed, though unfortunately by no means usually carried out, and one has only to look at the design and the executed work to see how great the loss has been. But if important in a house, how much more so in a great public building. And yet in England how often is this entirely ignored.

Another matter which I notice in London and other places with regret is the disappearance in the new quarters of the old-fashioned "square," which adds so much to the appearance of the older quarters. The new-fashioned "gardens" apparently have taken their place, the difference being that while a "square" was bounded by a public road and had the fronts of the houses facing it, the "gardens" have no surrounding road, and the backs of the houses abut immediately upon it. The result, of course, is that while the "square" adds greatly to the variety and beauty of our streets, the "gardens" are entirely hidden away, and might be non-existent as far as the public thoroughfares are concerned. The advantage claimed is the increased privacy obtained for the "gardens," counterbalanced, surely, by the improved outlook given by the "square" to the front of the houses, while the somewhat sordid surroundings of the "garden," with its rows of back windows and its stagnant air, hardly make for beauty or restfulness.

Numerous other points in the laying out of our cities will occur to all of us, but I mention these two with a view to asking whether something could not be done to insure that all such matters should be duly considered while improvements are under contemplation and before it is too late. I venture to think that these are matters in which this Institute and our allied societies can do important public service.

The design and details of buildings are a matter for the individual artist, and not one, in my opinion, in which this Institute can often, if ever, usefully interfere; but when great improvements are in contemplation the opinion of such a body as ours, composed of societies all over the country, may, I think, be of great use to the public authorities. Never, I feel assured, was there a time when our corporations and county councils were more anxious to do all in their power to improve the æsthetic aspect of our cities and towns, or more willing to avail themselves of every means to that end that may be open to them. The Government and the London County Council have frequently consulted this Institute on matters of architectural importance, and other public bodies do, from time to time, consult with their local architectural societies. Something, however, more definite seems to be required than this.

At present, as we all know, we architects are unable to erect any building in any of our towns without first submitting very complete plans, and in many cases elevations and specifications to the borough surveyor, who exercises, under the local by-laws, strict supervision with regard to height and size of rooms, windows, thickness of walls, the minutest details of drainage and other matters, but when it comes to laying out suburban districts, street improvements and such like, which call for the highest qualities of the architect, the plans are usually drawn by the borough surveyor, and subjected apparently to practically no expert criticism whatever.

Now, might it not be required that when such schemes have to be prepared they should be submitted for criticism and advice

to some expert architectural authority, such as, say, the local architectural society, who might also be asked to nominate an architect to consult with the surveyor in preparing the scheme and in the event of the corporation or council and the architectural society not agreeing on any point, might not the question be referred, say, for example, to the Council of this Institute? It surely could not be argued that this would be derogatory to the borough surveyor, for, as we architects cheerfully submit our proposals to the surveyors, there would seem to be no impropriety, but quite the reverse, in the surveyors laying their architectural schemes before the architects, and in important architectural schemes working with them.

In saying this it must be understood that I am not in the least impugning the capacity of the borough surveyors. They are, we all know, an exceedingly able body of men, but they are selected for these posts on account of their fitness and acquaintance with subjects somewhat apart from architecture proper, the study and practice of which subjects do not especially fit them for the designing of work of the highest architectural importance. They are, I venture to think, liable to have great pressure put on them to sacrifice too much to the very important questions of convenience and economy, and if this is so a further independent opinion would greatly strengthen their hands.

The tendency in recent years has been with corporations to substitute for the official "architect," as he used to be called, the surveyor; and this is, probably, the most reasonable course, for the matters which the works department of a corporation or council have mainly to superintend would more perfectly come under this heading, but it would seem reasonable that, when strictly architectural matters have to be dealt with, they should be subject to the criticism of architects, not necessarily officially connected with the local body.

I have dealt with this matter at some length, because it seems to me one in which the Institute could be of real use, and because it is one which so greatly affects the beauty of our cities and towns.

Another matter to which the attention of this Institute has been called is the local building by-laws in many rural or practically rural districts. This may at first sight seem a subject very remote from architecture, though in reality, as many of our members know, it affects architecture very much. These by-laws for rural districts are often drawn up on the lines of the building laws of large towns, they impose most unnecessary and burdensome conditions on those building in the country, and though the attention of the Local Government Board has been directed to the matter, and a deputation has been received, but little more has been done.

The London County Council have schemes on hand of the greatest magnitude, and they have, as is well known, consulted this Institute with reference to the great new thoroughfare from Holborn to the Strand. Unfortunately they were not able to adopt our suggestions in their entirety; but their committee, with the best intentions (which they appear not to have been strong enough to carry through), obtained designs in a limited competition, and a report upon them by an assessor, whose decision everyone would have been willing to abide by. This report, however, was not made public for two years, and appears to have remained a dead letter since, and now, I believe, this Institute and the public are absolutely in the dark as to whether there is to be any general scheme or control over the buildings to be erected, and, if so, by whom this control is to be exercised, whether each plot is to be let to the highest bidder without any reference to a general scheme, and finally what has become of the design placed first in the assessor's award; and yet it is hardly too much to say that in almost any other capital in Europe it would be looked upon as a matter of public and national importance, and surely it is one on which all are entitled to be informed.

In these public matters connected with architecture the daily Press might do much to educate public opinion; without the aid of the Press little is likely to be done. But in order to have the necessary influence architectural matters must be treated with a complete and thorough knowledge of the subject, as is usually the case in matters affecting the cognate arts.

The encouragement of local schools of art by their municipalities is another matter that should interest this Institute. It will be remembered that when London was being decorated for the recent Coronation the decoration of Westminster Bridge was entrusted to the Royal College of Art, and mainly through the instrumentality, I believe, of Sir William Richmond funds were provided by the London County Council for the purpose, the students giving their services. A very ambitious scheme was prepared and carried out, though, owing to the postponement of the Coronation, the scheme hardly received the attention it deserved, but I have reason to believe it gave a great impetus to the work of the college, the students devoting much enthusiasm to a scheme which was not a mere exercise, but one in which their work was actually to be seen in position. To I think the London County Council and all concerned are to be congratulated on this experiment, which might be usefully



followed throughout the country, for there are many buildings required for temporary purposes, such as those for exhibitions, receptions, rejoicings, meetings, all of which require erection and decoration, and present precisely the opportunity required for students to try their hands upon, and so to learn how much their work gains or loses when seen in reality, and in other surroundings than the studio in which it has been prepared. The employment of students in temporary work such as this is better than their employment on more permanent work, where their inexperience remains recorded against them, and may only end in discouragement. Besides it is only comparatively seldom that an opportunity for permanent work occurs, and when it does it is more properly reserved for men who have passed through the schools, gained experience and proved their ability. On the other hand, the temporary work gives the opportunity so much desired by students, and should it prove unsatisfactory it is soon removed and forgotten; besides, their employment should greatly increase the interest of the municipalities in their schools of art and the students who work in them. Much has been written lately of municipal socialism; we could, I think, do with a little more of it in this direction.

While considering the responsibilities of municipalities towards the encouragement of the arts and crafts, we may remind ourselves of the responsibilities that lie also with us. We rightly have a voice in the selection of the artists and craftsmen who work on our buildings, from the sculptor and painter who decorate them to the locksmith and upholsterer who furnish them; great encouragement may be given to the subsidiary arts if we take the trouble to find out individual artists to work with us in the various branches of the applied arts, and while fully illustrating our intentions give them sufficient freedom to carry out their own imagination and inventiveness, with their full share of credit for it. Depend upon it, great discouragement is caused to earnest workers, and much harm done, if just to save ourselves time and trouble we take the first article of commerce that comes to hand. Think what a school of craftsmen the enthusiasm of Pugin raised, producing work which is really little short of marvellous when we remember the sort of work that was being done at that time. We still feel its beneficial effects. Gilbert Scott, William Burges, J. F. Bentley and many others, both dead and living, have done the same; it is certainly one of the directions in which we can do incalculable good or ill to our art, and it is a responsibility of which we cannot and must not divest ourselves.

Smoke abatement is another matter this Institute may do something to assist in. The thick dark veil that falls over all our buildings is distressing in the extreme. One of the principles which Wren laid down for the rebuilding of London was, "all trades that use great fires or yield noisome smells to be placed out of the town," and we should see to it in this day that trades which cannot control this nuisance should be made to go outside.

Gentlemen, I cannot conclude without reference to one building recently erected, the Cathedral Church at Westminster, and its gifted architect, the late John Francis Bentley. The erection of a great church like this in the Metropolis is necessarily so rare an event that under any circumstances it would attract attention; but when, as in this case, the work was designed by one of the most inspired church architects of our day, and on lines different from any erected in recent times, it has naturally interested all of us, and excited in most of us an enthusiastic admiration. I do not propose here to give a critical notice of the building—that has already been done from various points of view, by abler pens than mine—but rather to enjoy the pleasure of noting the erection of a modern building in which all can unite in finding much to admire, though it will be a matter of lasting regret that its architect was not spared in health to witness the completion of his labours, and to receive the congratulations attending the consummation of so great a work nobly, and one may say in his case heroically, carried through.

The present generation will probably have seen three cathedrals of the first class in course of construction, viz the cathedrals of Truro, Westminster and Liverpool, the first, nearing completion, designed by one who mastered the old Gothic methods and feeling perhaps more entirely than any of his contemporaries, and who has produced a beautiful building, which might almost, so perfect is it, have been erected in the thirteenth century, and is probably destined to mark the high-water mark of achievement in the revival of a Mediæval style.

At Westminster the problem was different from that required by the traditional Gothic plan of a cruciform church, with deep choir and transepts; and this difference naturally and properly affected the whole design, and while an enormous uninterrupted area has been provided for the assembling of large masses of worshippers, the mystery so necessary for the interior of a religious building has been admirably preserved by the careful lighting, the simple intricacy of its arches, its piers, its ambulatories and its chapels. It is a step forward in church building nobly planned, and one for which we may be all

unreservedly grateful. I would only venture to hope that some day the entrance front may be better seen from Victoria Street by the removal of one or two houses, and that the interior of the building may in due course be worthily completed.

The last cathedral, Liverpool, is still one of the possibilities of the future; let us hope that it may prove, when erected, yet another step forward. I have already expressed my own opinion that the author of the design named as the best in the first competition should have been given an opportunity of showing what he could do on the new site; it has, however, been decided otherwise. The request in the first conditions for the second competition, that the building should be designed in a certain style was a curious instance of the inability of the public to trust architects to design for them what is more suitable, for though this condition has been since withdrawn, it is, I believe, generally understood that the promoters remain of the same opinion still. We can only hope that the best man may finally be entrusted with this great monumental work, and that, when it is completed, he may be rewarded by the unstinted admiration of his brother architects, the highest reward any of us can hope to gain.

We, all of us, lavish endless praise on old work, but are, perhaps, too chary of bestowing it upon that of our own time. If we are always contrasting the greatness of old work with the inferiority of the new, can we wonder if the public take the same view, and ask us to reproduce for them what we all so greatly admire? It is true we cannot reproduce old work; but the public do not understand that, for we do not teach them so. Great painters are not asked to paint in the style of Giotto, Fra Angelico, or Titian, and would not do so if they were. Excellent copies of these great masters are made; and in a few years are sometimes mistaken for the originals; but they are not made by our great painters, and are esteemed of little worth. Sculptors no longer masquerade our living statesmen in Poman togas, or attempt to reproduce a Jubilee procession in imitation of the Panathenaic frieze. Why, then, should we still be asked to design in the thirteenth century or any other bygone style? Because, we are told, we have no style of our own. But are we quite sure that a tradition once broken can never be revived again? And are we quite certain that the Renaissance tradition has ever been entirely lost in England? I do not think so. Are we going on for ever telling our young men they must not only study but copy old work, for they can never hope to produce anything equal to it? Is that likely to give them inspiration? Are we to tell them that, while painting and sculpture are alive, the last word has already been said on architecture? There cannot be an architect who holds this opinion, though I am afraid, under present circumstances, we cannot wonder if the public do so. I am not thinking of that will-o'-the-wisp, a new style—that may or may not come, I do not know; but rather suggesting that by a generous appreciation of modern work, and by boldly and generously showing our belief in it, good contemporary work may be encouraged and abound among us, so that the public may come to believe and be interested in it also.

There is one quality we all desire in our buildings, whether we attain it or not, repose, a quality we find alike in buildings so dissimilar as the exterior of St. Paul's and the interior of Westminster Abbey, in St. George's Hall, and even in that ornate river front of the Houses of Parliament. It is the result of good proportion, arrived at by matured knowledge, and guided by a true artistic sense; it is entirely independent of styles, it combines simplicity without baldness and richness under control. It is a quality that can be felt, and, as Wren says, "Aims at eternity."

Sir L. ALMA-TADEMA, R.A., proposed a vote of thanks for the address. He said allusion had been made therein to the question of education. This was a matter of great importance to architects, and so, too, was the question of apprenticeship. He believed that if apprenticeships to the architectural profession were abolished the art would suffer. He was convinced that it was dangerous for young men to travel in order to understand art. He said he felt men would get nearer attaining the long-desired national style if architects stayed more at home and learnt from the architecture of England.

Mr. J. MACVICAR ANDERSON seconded the vote, which was carried with loud acclamation.

## ECCLESIASTICAL DILAPIDATIONS.

AT the Lichfield Diocesan Conference the Rev. Prebendary Bolton presented the report of the committee appointed at the last conference to report on Mr. A. De Bock Porter's scheme and others for the amendment of the present law relating to ecclesiastical dilapidations. The report was as follows:—"Your committee have had before them Mr. De Bock Porter's scheme and also the other schemes set out in the appendix to the report of the committee of the Lower House of Convocation. Mr. De Bock Porter's appeared to be



the most practical one, and therefore they did not consider the others in detail, but went through Mr. De Bock Porter's clause by clause, and they recommend the conference to approve of it generally, but to express no opinion as to the amounts set out in clause 6 as being the payments likely to be required; and with respect to clause 7 they recommend that the payments in respect of glebe buildings, fences and drains be assessed upon the rateable value of the glebe lands exclusive of the parsonage house. The committee are unanimous in thinking that an annual payment to some central fund in respect of dilapidations should be compulsory upon every incumbent who occupies any glebe house or buildings. A considerable majority are in favour of the general principles of Mr. De Bock Porter's scheme; but some members of the committee think that the scale of payments with respect to parsonage houses should be based not, as he proposes, on the net income of the benefice, but on the rateable value of the premises belonging to it; and others think, on the contrary, that the scale of payments not only for parsonage houses but also for glebe buildings, fences and drains, should be based, as Mr. De Bock Porter proposes it should with respect to parsonage houses only, on the net value of the benefices. The conclusions of the committee, however, are those set out in the first part of this report."

Prebendary Bolton then moved:—"That this conference approves generally the principles of Mr. De Bock Porter's scheme for dealing with ecclesiastical dilapidations, and recommends the clergy to accept it as the best solution of the question." He said it was quite possible to riddle this scheme with objections, and that was why he asked the conference to accept the principle and general outline of the scheme. They were no doubt all agreed as to the desirableness of insurance in regard to life and property, and why should not the principle of insurance be as advantageously employed in regard to the wear and tear of church buildings? If this insurance scheme was approved an incumbent would know the worst and would not find himself face to face with large arrears. The premises would always be in order, and when a man died his widow or executors would not have claims made upon them which they could not pay, and the incoming incumbent would not have to pay money for dilapidations for which he was in no way responsible. Another important point was that special concessions would be made to livings of small value. The administration of Church property by the Ecclesiastical Commission had been immensely advantageous to the temporalities of the Church, and led to the belief that in their hands the dilapidation fund would be well administered and the glebe houses kept in good repair.

Mr. Lloyd Kenyon said as chairman of the committee by which the report was drafted he seconded the resolution without any hesitation in spite of the fact that he was also chairman of a committee which recommended a somewhat different scheme. That scheme was embodied in what was called "The Diocesan Commissioners' Bill," and to this scheme the conference was pledged. In that scheme they proposed, as Mr. De Bock Porter did, that every clergyman should be compelled to pay so much a year, in consideration for which his dilapidations would be provided for. They also proposed that the scheme should be managed under the direction of the Ecclesiastical Commissioners, and to these two points the conference was already pledged. Where this scheme differed from Mr. De Bock Porter's was in a number of details. The Lichfield Bill proposed that the payment should be made on the result of the architect's survey. Mr. Porter proposed that the rich livings should help the poor ones. It followed that if Mr. Porter's scheme was approved a living worth 400*l.* or 500*l.* a year would pay more than the actual dilapidations would probably cost, but that was not a necessary principle of Mr. Porter's scheme. That communistic principle could not, of course, be adopted without the approval of the clergy, but they might approve of the general principle of the scheme, and that was what he hoped they would do. The committee were unanimous in recommending that every clergyman should be compelled to pay so much a year, and that the dilapidations should be provided for by an outside authority. That was imposing no new burden on the clergy, as every clergyman was already bound by law to keep his buildings in repair.

The Rev. G. T. Royds said he desired to move the following amendment:—"That this conference is of opinion that no scheme which would increase the cost of up-keep (however satisfactory in securing the good condition of the glebe buildings, &c.) would be acceptable to the clergy, and that unless some scheme not open to this objection is put forward some compulsory form of insurance by which an adequate sum would be forthcoming in case of vacancy would prove the best method of providing for dilapidations." He said he opposed the adoption of the resolutions tooth and nail, because he believed that by no possible scheme could they secure the carrying out of that highest possible Christian principle of the rich helping the poor in this matter. He was satisfied that they could not pool the livings in such a way as would

secure this end. He was at one as to some compulsory form of insurance.

The Rev. J. R. Pyle seconded the amendment, remarking that he opposed Mr. Porter's scheme because he believed it would unnecessarily increase the burden upon the clergy instead of decreasing it. He considered that the scheme was one of the most cruel proposals to help the clergy out of their own pockets that had ever been brought forward.

Archdeacon Maude said the archdeacons only had the power to make a representation with regard to dilapidations when there was some glaring need for repair. The present Archbishop of Canterbury, who was a very good business man, strongly supported Mr. De Bock Porter's scheme.

The Rev. T. Auden said he supported the resolution. This was a case in which the Church must hang together as a whole. They must be ready to help one another.

Archdeacon Lane said he was in favour of Mr. Porter's scheme, because it would give them not only regularity of inspection but uniformity of inspection. They wanted the question of inspection reduced to a simple matter of business.

The Rev. C. W. Carrington said he was strongly in favour of Mr. Porter's scheme, because he believed it would be a Godsend to the whole Church. For his part, he should like to see the incomes from all the livings passed through a central fund, so that each clergyman might know what he was going to receive.

Mr. C. Lynam said he objected to the scheme because no provision was made for the improvement of the glebe lands, fences or buildings, which constituted a not inconsiderable portion of ecclesiastical property.

The President said he could not very well support the resolution as it stood. He was not prepared to recommend Mr. De Bock Porter's scheme as the best solution of the question. It was a scheme which required a great deal more consideration, and it had not been fully worked out by Mr. Porter himself. The whole subject had been under the consideration of both Houses of Convocation. The Lower House of Convocation had published its report, and the Upper House had published an interim report, in which they confessed that they were not able to make any representations at present. As the clergy knew, he sent out some time ago a circular to all rural deans asking them to consult the chapters and conferences on the subject, and until they got the returns he should be sorry for that conference to pledge itself to any one scheme. There were two recommendations in the report which were unanimously passed, and it would be more satisfactory if the mover and seconder of the resolution submitted to the conference would agree to substitute these recommendations. They were—(1) "That an annual payment to some central fund in respect of dilapidations should be compulsory upon every incumbent who occupies any glebe house or buildings," and (2) "That the payments in respect of glebe buildings, fences and drains be assessed upon the rateable value of the glebe lands, exclusive of the parsonage house."

These recommendations having been accepted by Prebendary Bolton and Mr. Lloyd Kenyon, the Rev. G. T. Royds withdrew his amendment, and they were carried with two dissentients.

#### CANON'S ISLAND ABBEY, CO. CLARE.\*

THIS structure, which was recently vested under the provisions of section I of the Ancient Monuments Protection Act, 1892, was taken in hand and repaired during the past summer. It is a rather extensive ruin of a church and conventual buildings which formerly belonged to the Augustinian Order; its foundation is ascribed to the last king of Munster, Donald Mor O'Brien, in the twelfth century. The buildings occupy a site on the northern portion of a small island, originally named Illaun na Ganonagh, of 222 acres in extent, situate at the confluence of the river Fergus and the Shannon, about three miles in a direct line north-east of Killadysert.

Of its historical record but little is known prior to the Dissolution. In A.D. 1483 a bishop of Killaloe, named Mahon O'Griffy, was buried here. Henry VIII. granted it to Donatus O'Brien and it was afterwards given to the Earl of Thomond. It was confirmed to James Duke of York (afterwards king) under Act of Settlement in 1669, and in 1712 it was granted by the seventh Earl of Thomond to Richard Henn. It passed from the Henn family into the hands of Lord Leconfield, who executed a fee-farm grant to Mr. Fitzgerald. In 1897 Mr. W. W. Augustine Fitzgerald, then high sheriff of county Clare, and his tenant, John Hastings, who holds a lease of the farm of which the abbey and its precincts form a part, vested the ruin in the Commissioners of Public Works as a national monument under the Act.

The abbey does not seem to have had endowments of any great value. From the Inquisition of A.D. 1577 it appears to

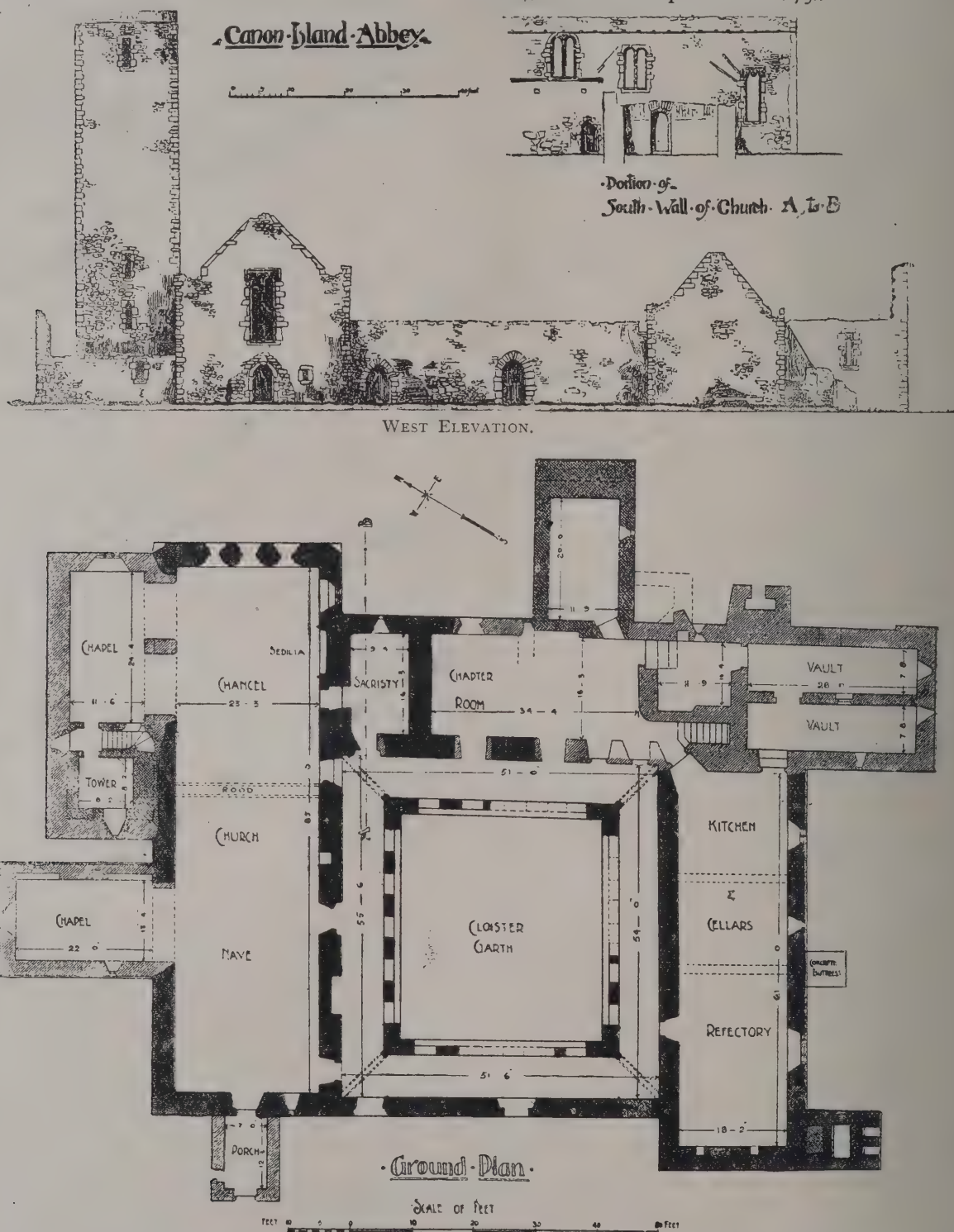
\* From the Report of the Commissioners of Public Works, Ireland.



have possessed four acres arable and fourteen of mountainous pasture with the abbey site of half an acre. Some of the other islands in the estuary of the Fergus belonged to it as well as two parts of the tithes of Killadyserf and the vicarage of Kilchrist on the mainland.

The site of the ruins is surrounded for the most part by a circular fence or cashel, now entirely covered with shrub and bramble. This enclosure is of stone, built roughly, about 12 to 15 feet wide at the base, and portions of it are 8 feet in height. This cashel is much older than the ruins, and no doubt enclosed residential buildings before the site was devoted to monastic purposes. Primitive establishments erected inside such an enclosure are found at Inismurray and elsewhere.

building a new church. This leaves the most interesting parts of the structure wanting in detail, and in the work of conservation, just executed, the gaps left by this gutting have been filled in with cement concrete (without any mouldings or carvings) where it was necessary to secure the stability of the walls. The other work done consisted chiefly in clearing the walls of the dangerous ivy and the interior of the fallen masonry, bramble, trees and rubbish, and pointing the walls where defective with cement mortar and protecting the top of the walls with a coating of concrete so as to preserve them from the infiltration of rain. The work was carried out by workmen at a daily wage, under the supervision of a clerk of works, and the total expenditure was 75%.



The existing remains consist of a church with tower and chancel and an aisle or side chapel, and transepts all at the north side. (See plan) The cloister garth, around which are grouped the usual conventual buildings, is on the south side.

The whole of the space within and around the walls, save in the nave and side chapels where burials take place, were filled with stone and rubbish covered with a dense mass of brushwood and bramble, with ivy and saplings growing out of the masonry of the walls. The ivy had injured the walls seriously by dislocating the masonry.

Some years ago all the cut stonework of the east window and the quoins of the gable and all other cut stonework easily accessible were taken out and removed to the mainland for

The following is a detailed description of the different portions of the structure:—

#### *The Tower.*

The tower appears to have been planted into the interior of the added north aisle or side chapel. In the interior lining of the walls of the tower the character of the masonry is of a better class and of later date (fifteenth century). At this time the small window at the foot of the stairs was inserted in the old work, as well as another narrow window 4 inches wide in the west wall of tower.

On the first floor are three windows—one in the western wall and two in the northern, one of which was intended to



light a small lobby at the head of the stone stairs, but appears afterwards to have been used as a sink for the discharge of slops through the wall.

On this floor there is a well-defined squint which would give a view of the high altar from the first-floor chamber in the tower. Between the tower and the church are traces of stone dressings, which indicate that an opening was formed here for the purpose of giving access to the rood-loft or gallery over the rood-screen.

There are stone corbels in the nave at this place, which supported the gallery across the width of the church.

The tower is different to most ecclesiastical towers of the period, inasmuch as it indicates in its construction features pointing to a residential occupation. In the Franciscan houses, when the fashion came in for erecting towers in the fifteenth century, they were placed between the choir and nave. In the case under notice that position was not adopted, and it is not clear that the tower was intended to carry a bell, as there is no large window at the belfry stage, such as was always found in towers intended for bells. It was, therefore, apparently intended as a fortified residence; access to it was obtained only through the northern side chapel. There were four floors in addition to the ground floor, only the first floor was vaulted. The corbels supporting the other floors are still observable. In general character this tower bears a strong resemblance to many of the smaller castles of county Clare, built during this period. A similar tower was added to the church of Killadysert for a like purpose. It would seem as if some of the conventual buildings at Canon Island had fallen into disuse, and that the tower had become the residence and place of refuge of a few clerics. It could hardly have been intended for the prior's lodgings only.

#### *North-East Chapel or North Aisle.*

This chapel measures 24 feet 4 inches in length east to west, by 11 feet 6 inches. It has an arcade of two pointed arches, opening into the choir without any cut stonework. The pier has chamfered jambs on the face next the choir. This chapel would appear to have been a late addition (probably early fourteenth or late thirteenth century); a three-light window in the east, now bereft of centre mullions and tracery, is of this date. The north wall of the church was originally 3 feet 7 inches in thickness, but when the chapel was added the wall was increased to 5 feet to strengthen the pier and abutments of the two arches.

#### *North-West Chapel.*

This chapel measures 22 feet north to south by 13 feet 4 inches east to west, and appears in the form of a transept, the eastern chapel partaking of the character of an aisle. It is approached from the nave by a pointed arch 11 feet 9 inches in width. This chapel has a two-light window with semi-circular heads in the north gable. There is a small window in the eastern side wall, square-headed. There are two altar recesses in the side wall of this chapel and an aumbrey; the recesses are not arched over, but each has a corbel at the jambs which projects and carries a flat lintel. There is a small square-headed window in the western side wall.

#### *The Nave.*

The external approach to the nave is through a porch, 12 feet 3 inches in length east to west and 7 feet in width. The walls are 1 foot 9 inches in thickness. The entrance doorway has chamfered jambs and a pointed arch (see western elevation), and a similar doorway opens into the nave. The church measures in its extreme length between the east and west gables 85 feet. There is now no trace of a division between nave and choir except what may be inferred from the position of corbel blocks in the side walls, evidently intended to carry the rood-beam and loft over the screen separating the nave from the choir. If we adopt this supposition as correct, it would give a nave measurement of 48 feet in length and a choir of 37 feet in length, each measuring 23 feet 3 inches in width. At the entrance to the nave, on the south side, is an arched doorway leading directly into the cloisters. There is another similar doorway in the cloister walk further on in the south wall, with a holy-water stoup in the angle of the west jamb having two openings into it, one from the doorway and one from the church. Nearer the screen is a small recess, apparently an aumbrey, used probably in connection with an altar placed before the screen dividing nave from choir.

#### *The Choir.*

The choir was lighted by a large window of three separate lights divided by two solid piers. The whole of the cut stone dressings of this fine window, except those of the discharging arch in the gable over the three lights, were taken out of their position and carried off from the island with the intention of using them for building purposes, and the window now presents a very ragged appearance, with large gaps in the jambs and arches from which the cut stonework was removed.

There is still a stone *in situ* which gives an outline of the mouldings which decorated the inner jambs. This moulding

was carried up as a shaft to the springing of the arch, where it was surmounted by a small capital. The general finish was somewhat similar to the three-light window in the east gable of Kilfenora Cathedral.

In the south wall of chancel there is a two-light window inserted of late fifteenth century date. This window presents some peculiarity. It has a straight splay to west jamb internally, and the recess is arranged so that the cill is stepped to different levels. It has also a curious sinking in the internal face of the dividing mullion carried also round the jambs.

The choir has two other windows in the south wall at a higher level, one of which is a two-light semicircular headed window of late date, and it opens into what would have been the roof space over the sacristy. The weathering course of this roof appears on the face of the wall; it is difficult to account for this position of the window unless it was inserted at a period when the roof abutting against the choir wall had been removed.

In the choir is the usual recessed space for the sedilia. There is a stone seat with cut stone jambs and arch, the latter of ogival form with finial; at each side is a small projecting pilaster terminated by a finial.

A doorway from the choir leads into the sacristy, an apartment 16 feet 3 inches by 9 feet 4 inches. A door leads from it into the east cloister walk. This door is an insertion.

The cloister walks on the four sides of the garth or cloister enclosure are well defined. A simple arcade of five openings in plain hammer-dressed stone piers runs round each side; each opening measures 3 feet 6 inches in width. There is nothing to indicate whether these openings were arched over or had merely a stone lintel; the latter is most probably the case, but at each of the four angles are cut stone ribs and corbels rising from chamfered shafts connected with the cloister wall with caps and bases.

In the south wall of church and north side of cloister is an arched recess 6 feet in width, which may have been a shrine or formed space for a seat or cupboard for books. The ranges of buildings to the south of sacristy are in a very ruinous condition, and the position of the chapter-house cannot be very clearly defined, and there are traces of many changes. There are no traces of fireplaces in any portion of the ruin save in one of the vaults at the south-east angle, where a recent opening has been made in the arch to permit the escape of smoke. The range south of the cloister is in one apartment, the larger portion of which, at the western end, was used as the refectory, and over this was a range of dormitories.

The interior of the church is used as a burial-ground by about twenty families on this and the adjoining islands, and a number of headstones disfigure the ruin. The burial-ground is under the control of the local Board of Guardians.

The south wall of refectory range was dangerously overhanging, and it was necessary to support the wall with a concrete buttress. A concrete floor was put over the vaulted roof of the buildings at south-east angle to protect the masonry. The use of concrete in work of this kind has the advantage of showing distinctly what new work has been done and the extent of it.

## THE INSTITUTION OF CIVIL ENGINEERS.

THE eighty-fourth session of this Institution was opened on Tuesday, when the president (Mr. J. C. Hawkshaw) delivered his inaugural address.

The President, who was cordially received, said the century which had just closed would always be memorable for the birth and growth to maturity, and, as some might say, to an honourable old age, of traction by steam-power on railways. Far-reaching as the results of this growth had been throughout the world, this country could not have reaped so rich a harvest from it without a corresponding growth of our dock system, which had also made its mark on the nineteenth century. That we required deeper docks with deeper entrances to them was because iron had taken the place of timber in shipbuilding, so that the use of iron had not only revolutionised shipbuilding, but had necessitated the rebuilding of our docks and harbours. The progress of the last century had been mainly due to the use which had been made of the metal, iron. In their enthusiasm for the great results achieved by this new material they might overlook what they had owed in the past and what they still would require in the future from an "old-world material," timber. Engineers here could not do without timber, nor, indeed, without much timber. For the last thirty years they had heard it said in that room that steel would shortly be adopted in place of wood for sleepers; but although we could make our own steel, but had to import our timber sleepers, this had not come to pass. France had experimented for years in iron and steel sleepers; but few were laid in France, which, in spite of her well-managed forests, had to import sleepers. More metal sleepers are used in Germany, also a timber-importing



country, but Germany used much wood still for sleepers. Metal sleepers were used in South Africa, and, together with native timber, in Australia, India and South America. In Argentina some of the iron sleepers had recently been replaced by native wood sleepers. The United States and Canada use wood only, and use more wood for sleepers in proportion to their railway mileage than in any other country, 2,500 to 3,150 being laid to a mile in the former, and 2,600 to a mile in the latter, as compared with 1,760 to 2,145 a mile in this country. The consumption of timber for sleepers increased yearly, and more are now laid to a mile than formerly, especially in the United States and Canada, but there is a tendency to slightly reduce the number in the United States, and to increase it in this country. The increase in the use of creosote prolonged the life, and so somewhat reduced consumption. In this country we had less area under forest in proportion to our size than any other country in Europe except Portugal, and our timber imports were, in weight, more than half the total timber imports of the timber-importing countries of Europe. In Europe there were only five countries which exported timber—Russia, Sweden, Austria-Hungary, Norway and Roumania—and the amount exported by these five countries was nearly 2,750,000 tons short of the total amount required in Europe. Germany, with 26 per cent. of its area under forest, and that admirably managed on scientific principles, against our 4 per cent., imported nearly half as much as we do. France, too, with 18 per cent. of its area under forest, and that scientifically managed, as in Germany, imported 1,250,000 tons of timber a year. Belgium, with 17 per cent. under forest, imported still more largely in value, though somewhat less in weight. Denmark, Italy, Spain, Holland, all import. Of the timber imported into this country in 1899 more than nine-tenths in weight and nearly four-fifths in value was coniferous wood, which was grown in the temperate countries of the Northern hemisphere, and this was the timber which was most largely consumed in engineering work. As Europe could not supply its own wants, our only other source was Canada, on which the United States was making increasing demands for timber, and Canada itself, with its enormous resources in water-power, would soon be a large consumer of its own forest produce. In this country forestry was neglected. Germany and France had long applied science to the growing of timber, and to them we had to go to learn. Belgium had done likewise. Even Spain, which had suffered more than any country in Europe from the destruction of forests, had a Government Forest Department. Russia, Sweden and Austria-Hungary looked after their forests. Denmark did much, Norway something, but not enough. As recently as 1890 the Chief of the Forestry Division of the United States Agricultural Department said that the United States was the most backward of all civilised nations in recognising the necessity of action with regard to forest resources. Happily a change had taken place in the last ten years in the United States, and Great Britain might now be regarded as the most backward of all civilised nations "in recognising the necessity of action with regard to forest resources." It was to be hoped that the labours of the committee now sitting, which was appointed by the Board of Agriculture this year to inquire into and report upon the present position and future prospects of forestry and the planting and management of woodlands in Great Britain, would result in steps being taken to remove this reproach. Dear timber would mean higher rents and higher wages to meet them. Why should we import nearly 100,000,000 cubic feet of timber in pit-props each year which we could grow ourselves? Prop-wood did not take three or four generations to grow, like sawyers' wood. The railway companies were partly to blame. They did little to help the buyers of home-grown timber, who had already begun to carry what they buy by steam traction on roads in consequence. The railway companies took thousands of tons of unpaying deadweight from all parts of the country back to the collieries each year in the shape of empty coal waggons, many of which might go back loaded with home-grown pit-props if the companies would seek to encourage such traffic.

A vote of thanks was accorded the President for his address.

### GENERAL.

**Professor Hilprecht**, the head of the archaeological department of the University of Pennsylvania, states that the Sultan, in recognition of the services rendered by him to the Imperial Museum at Constantinople, has presented him with the richest collection of Babylonian antiquities in the world. Professor Hilprecht has placed it in the University Museum. He considers the collection superior to that in the British Museum.

**The Glasgow Exhibition Executive** have published a statement as to the surplus from the recent exhibition. According to it there is 32,000*l.* on deposit in the bank, while a considerable sum, probably 15,000*l.*, is expected to be

realised from the sale of old materials. The surplus from the previous Glasgow exhibition amounted to 55,000*l.*

**The Broderers' Company's** forthcoming exhibition will consist of three classes of exhibits, and in each class seven prizes ranging from 2*l.* to 5*l.* 5*s.* are offered. The value of each exhibit must not be less than five guineas. About 360 exhibitors have entered for the various classes, while the exhibits number 533 pieces.

**The Monument** of the late Prince Christian Victor, by M. Emile Fuchs, intended for St. George's Chapel, Windsor, is being exhibited, by permission of the King, at the Grafton Galleries, together with other works.

**A Loan Exhibition** of pictures is to be held in the Art Gallery at the Guildhall, London, next spring. The Corporation will allow for expenses a sum not exceeding 500*l.*, exclusive of insurance.

**The Cape House of Assembly** have passed a vote of 20,000*l.* towards the erection in London of a national memorial to the late Queen Victoria.

**Wrexham Parish Church** has been restored at a cost of 10,000*l.* The north porch has been restored solely by members of Yale University, in memory of the founder, whose body lies close by. The new west porch doors, a memorial to the late Duke of Westminster, whose gift of 2,000*l.* enabled the work of reparation to be begun, were dedicated.

**A Memorial** will shortly be erected within the precincts of Guy's Hospital to the memory of those Guy's men whose lives were lost in the service of their country during the South African war. The memorial will take the form of a drinking-fountain to be placed in the colonnade, and a suitable design by Mr. Frederick Wheeler, F.R.I.B.A., has been selected.

**The Society for the Promotion of Hellenic Studies** held their first general meeting on Tuesday last, when a paper was read on "The Natural Basis of Form in Greek Art, with especial Reference to the Pantheon," by Mr. Gay Hambidge.

**A Meeting** of the Council of the National Trust for Places of Historic Interest or Natural Beauty was held at Westminster last week, Sir Robert Hunter presiding. Princess Louise, Duchess of Argyll, was elected president of the Trust, in succession to the late Lord Duferin, her Royal Highness having consented to accept the post. Lord Carlisle was (subject to his consent) elected vice-president. The date of the annual general meeting of the Trust was fixed for Monday, November 17.

**A Strike** of bricklayers in the Kidderminster district, which began in April, has been ended by an award given by his Honour Judge Austin, of Bristol, who was appointed arbitrator by the Board of Trade. He has decided in favour of the men, giving them a halfpenny per hour advance, and also certain concessions on other points.

**The Court of Common Council** have rejected a recommendation that the Corporation should acquire and take over the management of about 802 acres of land formerly forming part of Hainault Forest, and provide 10,000*l.* towards the purchase money.

**St. Ann's Church**, Bishop Auckland, has been considerably embellished. The north and south walls of the chancel have been furnished with handsome side screens, enriched by carved tracery spandrels and open cresting. The latter work is set off by the addition of an elaborate richly carved reredos, and includes four canopies. The architects were Messrs. Hicks & Charlesworth, of Newcastle, and the builders Messrs. Mowbray & Son, of Reform Place, Durham.

**The Northern Architectural Association** will hold the opening meeting on Wednesday next, when Mr. F. Caws will deliver his presidential address. Papers will be read during the session by Mr. F. Baker, Mr. R. G. Hatton, Mr. H. Cayley, Mr. R. Hedley, Mr. A. Greenwell and Mr. R. P. S. Twizell.

**Cabot's Quilt** for insulating and deafening purposes, referred to in Professor Norton's report, published last week, is sold in this country by the B. & S. Folding Gate Company, as will be evident from our advertisement pages.

**Mr. Halsey Ricardo** will read a paper on "The Revival of Gothic Architecture" before the Manchester Society of Architects on Thursday, the 13th inst.

**The Opening Meeting** of the Leeds and Yorkshire Architectural Society was held last evening at the Queen's Hotel, Leeds, when Mr. Butler Wilson delivered an address.

**The Sites Committee** of the Lancashire Asylums Board have issued a report re the new asylum for Lancashire. They recommend the purchase of Whalley Abbey farm estate, Whalley, containing 233 acres of land, for 25,630*l.*, and also of 68½ acres of adjoining land for 6,000*l.* The committee state that as there is no asylum in East Lancashire they have always been desirous of obtaining an estate in that part of the county, and strongly recommend the purchases named, subject to the approval of the Lunacy Commissioners and satisfactory arrangements being made with the Blackburn Corporation for a water supply. The Board are to consider the recommendations to-day (Friday).



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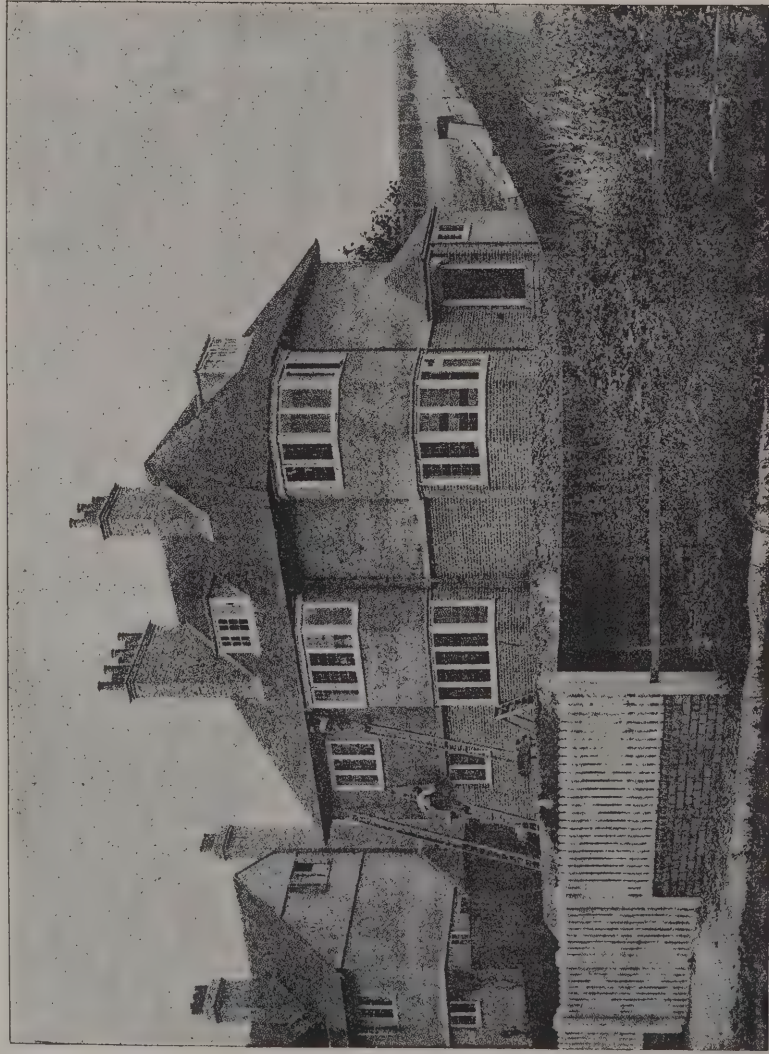




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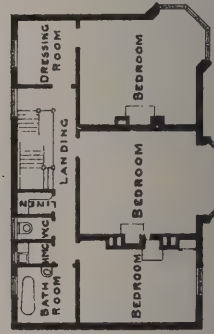
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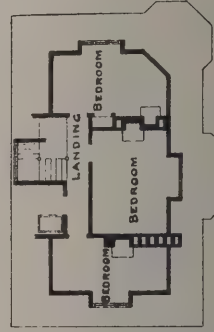
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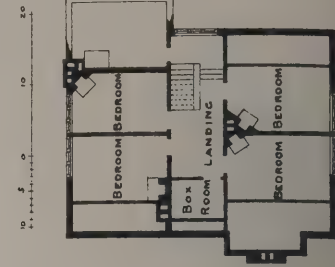
FIRST FLOOR PLAN



SECOND FLOOR PLAN



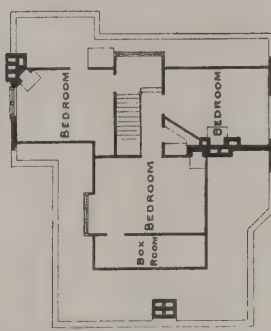
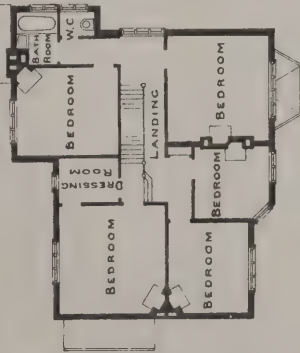
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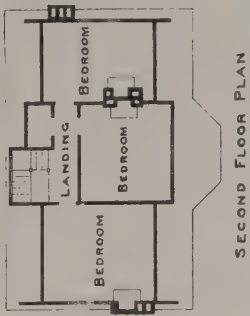
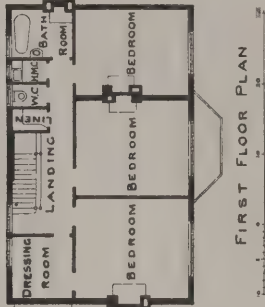
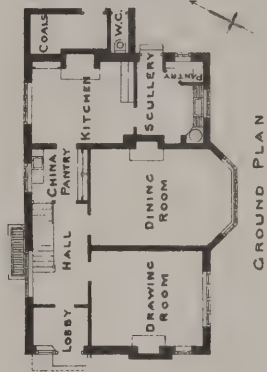




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THE

# Architect and Contract Reporter.

## EDITORIAL NOTICES.

*view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*respondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

## TENDERS, ETC.

*As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

## COMPETITIONS OPEN.

**ASHTON-IN-MAKERFIELD.**—Dec. 31.—Designs, &c., are invited for the enlargement of the Infectious Diseases Hospital. Architect whose plans are accepted and approved will be employed by the Council to carry out the work at the usual professional charges. Plan of the hospital site, together with full particulars of the alterations and extensions required, may be obtained from Mr. T. Burgess, surveyor, at the Council Offices.

**CAPE TOWN.**—Jan. 31.—The Council of the University of Cape of Good Hope invite designs for the erection of university buildings. Premiums of 400*l.*, 200*l.* and 100*l.* will be awarded to the authors of the designs placed first, second and third respectively. Particulars of the competition may be obtained on application to the Registrar at Cape Town, or to the Agent-General in London.

**ECCELES.**—Dec. 12.—Plans are invited for the laying-out of an area of land and for erection of dwellings for the working-class on part of such area. Premiums of 50*l.*, 30*l.* and 15*l.* will be awarded in respect of the plans placed first, second and third in order of merit. Mr. Wm. Henry Hickson, town clerk, Town Hall, Eccles.

**DURBAN (NATAL).**—Dec. 18.—Designs are invited for new town hall, library, museum, art gallery and municipal offices. Three premiums of 500*l.*, 300*l.* and 200*l.* respectively will be awarded for the three best designs in order of merit. Mr. W. H. Radford, C.E., Albion Chambers, Nottingham.

**HOLYHEAD.**—Dec. 2.—Sketch designs are invited for schools and a teacher's house. The competitor whose designs and terms are approved and accepted by the Board will be appointed the architect. Mr. R. E. Pritchard, clerk, Holyhead.

**HULL.**—Jan. 31.—Designs in competition are invited for the extension of the town hall. Premiums of 300*l.*, 200*l.* and 100*l.* are offered. Mr. E. Laverack, town clerk, Town Hall, Hull.

**ILKESTON.**—Nov. 28.—Competitive plans for a mixed junior school to be erected in Bennerley Street are invited. Particulars may be obtained from Mr. Wright Lissett, Town Hall, Ilkeston.

## CONTRACTS OPEN.

**ASHTON-UNDER-LYNE.**—For erection of three houses in William Street, Ashton-under-Lyne. Messrs. Thos. George & Son, architects, Old Square, Ashton-under-Lyne.

**BARNESLEY.**—Nov. 11.—For erection of outbuildings and conveniences at the Locke Park. Mr. J. Henry Taylor, borough surveyor, Manor House, Barnesley.

**BARROW-IN-FURNESS.**—Nov. 12.—For (1) an electric motor and pump to be erected in a shed adjoining the corn mill, Devonshire Dock, and (2) the construction of a cast-iron tank of a capacity of 2,500 gallons on the water-tower in the gas-works yard. Mr. C. F. Preston, town clerk, Town Hall, Barrow-in-Furness.

**BIRMINGHAM.**—Nov. 15.—For erection of sanitary outbuildings at the old school block at the workhouse, Gravelly Hill. Mr. Cooper Whitwell, architect, 23 Temple Row, Birmingham.

**BOOTLE.**—Nov. 17.—For erection of cart-sheds, store-rooms and boundary wall at the refuse destructor, Pine Grove, Bootle, Lancs. Mr. J. Henry Farmer, town clerk.

**BRADFORD.**—For remodelling shop and office premises in Market Street, Bradford. Messrs. Mosley, 6 Wormald Row, Leeds.

**BRADFORD.**—Nov. 15.—For erection of baths, Drummond Road, Bradford. Mr. F. E. P. Edwards, city architect, Chapel Lane, Bradford.

**BRADFORD.**—Nov. 15.—For heating the district baths, Drummond Road. Mr. F. E. P. Edwards, city architect, Chapel Lane, Bradford.

**BRAINTREE.**—Nov. 15.—For erection of new master's quarters, &c., at the workhouse, Bocking, Braintree, Essex. Mr. Fred. Smoothy, clerk, 1 New Street, Braintree.

**BRIGHTWELL.**—Nov. 10.—For construction of an organ chamber. The Rev. F. G. Kiddle, rector, Brightwell Rectory, near Wallingford.

**BRISTOL.**—Nov. 19.—For erection of a group of homes, with hall, &c., for the accommodation of about 200 children at Downend. Messrs. La Trobe & Western, architects, 20 Clare Street, Bristol.

**BROMSGROVE.**—Nov. 15.—For erection of the first portion of the proposed new lunatic asylum on the Barnesley Hall estate, near Bromsgrove, Worcestershire. Mr. George T. Hine, architect, 35 Parliament Street, Westminster.

**BURTON-UPON-TRENT.**—Nov. 28.—For erection and equipment of an inclined retort plant and machinery at the gasworks. Mr. F. L. Ramsden, manager, Gas and Electric-light Works, Wetmore Road, Burton-upon-Trent.

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CANTERBURY.—Nov. 10.—For supply of furniture to the borough asylum. Dr. Norman Lavers, medical superintendent, borough asylum, Stone House, Canterbury.

CHELMSFORD.—Nov. 13.—For erection and maintaining of a gas-engine at the waterworks pumping station at Great Baddow. Mr. James Dewhirst, engineer, Avenue Chambers, Chelmsford.

CHELMSFORD.—Nov. 17.—For erection of cottages for scattered homes. Messrs. Chancellor & Son, architects, Chelmsford.

CONWAY.—Nov. 19.—For strengthening and widening of Conway Suspension Bridge. Mr. T. E. Parry, clerk to the Conway Bridge Commissioners, Conway.

COVENTRY.—Nov. 23.—For construction of two concrete and brick gasholder tanks at the Foleshill Gasworks. Mr. Fletcher W. Stevenson, engineer and general manager, Gasworks, Coventry.

CRAWLEY.—Nov. 13.—For alterations and additions to house at West Green, Crawley. Mr. William Buck, architect, Crawley, Sussex.

CROYDON.—Nov. 17.—For erection of two cottages and supply and erection of about 73 yards of oak park fencing, 6 feet in height, with two gates, &c., at Beddington Corner, near Croydon. Mr. E. Mawdesley, town clerk, Town Hall, Croydon.

DARTFORD.—Nov. 18.—For additions to the West Hill Boys' School, Dartford. Mr. Henry Hall, architect, 19 Doughty Street, W.C.

DARTFORD.—Nov. 19.—For erection of a home for female attendants at the Darenth Asylum, Dartford, Kent. Messrs. Newman & Newman, architects, 31 Tooley Street, S.E.

DERBY.—Nov. 17.—For alterations and additions to the Abbey Street higher-grade Board school. Mr. F. S. Antliff, architect, Draycott, Derby.

DIDCOT.—Dec. 1.—For alterations and additions to the Board school at Didcot. Messrs. Hoare & Wheeler, architects, 17 Friar Street, Reading.

DUKINFIELD.—For cleaning reservoir, Dukinfield. Mr. H. Matear, The Temple, Dale Street, Liverpool.

GERMANY.—Nov. 28.—For concession of laying-down and working for fifty years a water supply for the town of Crajora. Mr. W. H. Lindley, Frankfort-on-Maine, Germany.

GREENOCK.—Nov. 21.—For erection of a residence for the chief officer of H.M. Coastguard at the Royal Naval Reserve Battery at Greenock, N.B. The Director of Works Department, Admiralty, Avenue House, 21 Northumberland Avenue, W.C.

GREENWICH.—Nov. 12.—For erection of a fence and gate along the western side of the public footway dividing the wharf at the Borough Council's depôt, Banning Street, East Greenwich. Mr. Francis S. Robinson, town clerk, Town Hall, Greenwich Road, S.E.

GREENWICH.—Nov. 18.—For supply and delivery of one 50-ton electric power overhead travelling crane, with auxiliary 20-ton hoist, and for the erection of same at the London County Council's electricity generating station. All particulars at the County Hall, Spring Gardens, London, S.W.

HAMPSTEAD.—Nov. 13.—For erection of stabling up to damp-course level, a boundary wall, a concrete siding, &c., at new depôt at Lymington Road, Finchley Road, N.W. Mr. O. E. Winter, borough engineer, Town Hall.

HAMPTON.—Nov. 11.—For erection of 55 cottages at the Rosehill estate, Hampton, Middlesex. Mr. Edgar Cozens, clerk, R. D. C., Public Offices, Hampton, Middlesex.

HANWELL.—Nov. 24.—For alterations to the Boston Road schools, Hanwell. Mr. William Pywell, architect, Cumberland House, Hanwell, W.

HUDDERSFIELD.—Nov. 11.—For erection of a weaving shed at Thirstin Mills, Honley. Mr. J. Berry, architect, 3 Market Place, Huddersfield.

HULL.—Nov. 19.—For alterations and additions to the Hull Paragon Street passenger station, for the North-Eastern Railway Company. Mr. William Bell, architect, York.

IRELAND.—Nov. 10.—For stone-breaking and screening plant for the Belfast improvement committee. Sir Samuel Black, town clerk, Belfast.

IRELAND.—Nov. 11.—For putting-in new baths, washhand basins and washtubs at the male and female auxiliary infirmaries at the workhouse, Belfast. Messrs. Young & Mackenzie, architects, Belfast.

IRELAND.—Nov. 15.—For erection of a new shirt factory at Belview Avenue. Mr. J. M. C. Knox, architect, 2 East Wall, Londonderry.

IRELAND.—Nov. 17.—For erection of a presbytery at Gortin. Mr. E. J. Toye, architect, Ulster Buildings, Waterloo Place, Londonderry.

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IRELAND.—Nov. 17.—For erection of 14 labourers' cottages, Monaghan. Mr. S. Mitchell, clerk to the Guardians, Clones.

IRELAND.—Nov. 17.—For erection of three two-storey cottages at Tynan station, for the Great Northern Railway Company (Ireland). Mr. T. Morrison, secretary, Amiens Street Terminus, Dublin.

IRELAND.—Nov. 17.—For erection of a new station building in timber at the Ballybeg station, for the Great Northern Railway Company (Ireland). Mr. T. Morrison, secretary, Amiens Street Terminus, Dublin.

IRELAND.—Nov. 21.—For erection of new buildings at Gransha for the committee of management of the Londonderry district lunatic asylum. Mr. M. A. Robinson, Richmond Street, Londonderry.

ISLINGTON.—Nov. 10.—For supplying and fixing iron shelving, woodbox linings to stone shelves and for alterations in the strong-rooms at the Town Hall, Upper Street, Islington, N. Mr. Patten Barber, borough engineer, Town Hall, Upper Street, N.

KINGSTON-ON-THAMES.—Nov. 17.—For supply and erection of two external iron staircases and the construction of emergency exits to the old central buildings at the workhouse. Mr. W. H. Hope, architect, Hampton Wick, Middlesex.

LEWISHAM.—Nov. 18.—For supplying iron fencing, carriage paid, to Catford railway station, South-Eastern Railway. Particulars and form of contract may be obtained at the office of the Surveyor, Town Hall, Catford.

LONDON.—Nov. 12.—For construction of two jetties and works at the wharf, 167 Grosvenor Road, S.W. Mr. John Hunt, town clerk, City Hall, Charing Cross Road, W.C.

LONDON.—Nov. 18.—For roadwork and platelaying required for the reconstruction on the conduit system for electric traction of the tramways:—(a) From the Elephant and Castle, *via* New and Old Kent Roads to East Greenwich; (b) from the Elephant and Castle, *via* Walworth Road, Camberwell Green, Church Street, Peckham Road and Queen's Road to New Cross Gate. Particulars from the Engineer's Department, London County Council, County Hall, (Spring Gardens, London, S.W., on payment of 10s. returnable).

MANCHESTER.—Nov. 10.—For construction of a boundary-wall and foundations for the high-level railway and coal bunkers at the Stuart Street generating station, Bradford, Manchester.

Particulars may be obtained at the City Surveyor's Office, Town Hall, Manchester.

MANCHESTER.—Nov. 12.—For reconstruction in brickwork of Lyon Street bridge, Blackley. Particulars may be obtained on application at the City Surveyor's Office, Town Hall, Manchester.

MENHENIOT.—For extension of mill building and erection of new buildings for St. Mary's Lead Works, Ltd. Mr. B. Angwin, superintendent, Menheniot, Cornwall.

MONTE VIDEO.—Dec. 15.—For the sanitary works to be carried out in Monte Video harbour. Works offered for tender include the following:—(a) A rock tunnel, 1,278 metres in length, 3m. 65 in height, and 3m. in width; (b) a main collector, 1,557 metres 60 by 1,283m. 30 in length, oval profiles 1'80m. and 1m. 70 in height respectively; (c) a secondary collector 2,016m. in length, varying its oval profiles from 1'70m, 1m. 25, and 0m. 98 in height; (d) the auxiliary collectors, affluents, &c. Plans, estimates and general conditions can be had in Monte Video by applying to the "Ministerio de Fomento," and through the respective Legations in Europe. Tenders made in Europe through the Legations in the above-mentioned countries should be handed to the said Legations at least one month before the mentioned date. Plans, &c., may be seen at the offices of the Consulate-General of Uruguay, Edinburgh Mansions, Howick Place, Victoria Street, S.W.

NEWTON ABBOT.—Nov. 11.—For erection of a nurses home at the workhouse, Newton Abbot, Devon. Mr. Samuel Segar, architect, Union Street, Newton Abbot.

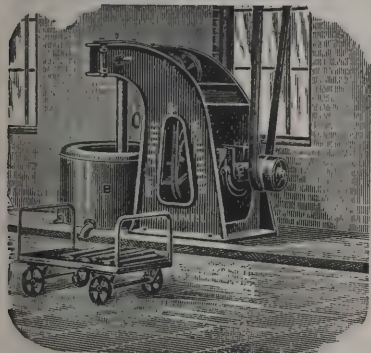
NORWOOD.—Nov. 12.—For erection of outside staircases at Norwood schools as a means of escape in case of fire. Mr. W. Thurnall, clerk to the Guardians, Brook Street, Kennington.

NOTTINGHAM.—Nov. 20.—For erection of station buildings, &c., at Nottingham, for the Midland Railway Company. Particulars may be obtained on application at the Engineer's Office, Derby station.

PARKESTON.—Nov. 13.—For erection of new schools for 510 children and alterations to present schools at Parkeston, Essex. Mr. J. W. Start, architect, Colchester.

PORTLAND.—Nov. 21.—For erection of new coastguard buildings, consisting of quarters for four men, at Grove Point, Portland, Dorset. Particulars may be seen at the Superintending Civil Engineer's Office, H M. Breakwater, Portland.

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## ALDEBURGH.

For sewerage works in Lee Road, Alde Lane, Crespigny Road, Hartington Road, Beaconsfield Road, Park Lane, Fawcett Road and The Terrace, Aldeburgh, Suffolk. Mr. J. C. GORDON, borough surveyor.

T. W. Pedrette	£1,571	10	2
Bradshaw & Co.	1,159	3	8
G. Burgoyne	1,124	12	0
G. Rackham	1,023	7	4
J. W. Dean	930	17	6
Case Sea Defence Syndicate, Ltd.	890	12	0
S. BAKER, Aldeburgh (accepted)	889	18	2

## BARNSTAPLE.

For relaying a sewer in Pulchrass Street.

T. Barwick	£80	0	0
W. Sanders	66	16	0
H. BURGESS, Bear Street (accepted)	59	10	0

## BIRMINGHAM.

For supplying and fixing eaves and gutters at the workhouse, Gravelly Hill.

E. A. COOKE & Co., Broad Street, Birmingham (accepted)	£29	19	11
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## BRADFORD.

For demolition of steam boiler chimney. Mr. FRED HOLLAND, architect, 11 Parkinson's Chambers, Hustlergate, Bradford.

T. NORMINION & SONS, Dirkhill Street (accepted)	£33	0	0
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## BRIDLINGTON.

For construction of underground lavatories in South Cliff Road.

A. Gardam	£1,441	0	0
E. Corner	1,375	0	0
F. Postill	1,269	0	0
F. Flintoft	1,269	0	0
J. Sawdon	1,222	0	0
G. STORR, Bridlington (accepted)	1,195	0	0
W. Barnes	1,188	0	0

## BURNLEY.

For extension of bridge and excavation, and for alteration to goods yard at Burnley (bank top), for the Lancashire and Yorkshire Railway Company.

TATE & GORDON, Manchester (accepted).

## BUXTON.

For laying of about 1,100 lineal yards of 24-inch and 36-inch diameter cast-iron sewer and the construction of six filter-beds. Mr. WM. HEDLEY GRIEVES, town surveyor.

J. Holme	£11,281	15	3
C. Chamberlain	10,553	19	10
Bentley & Lock	9,703	13	1
Oakes Bros.	9,674	7	7
Johnson & Langley	9,617	12	11
Hayes Bros.	9,252	4	1
W. R. Upwin	9,247	15	10
Robinson & Son	8,952	11	4
W. Bradshaw	8,874	6	5
Embrey & Co.	8,452	7	8
A. J. Cottle	7,778	2	7
Ainscoath & Son	7,514	18	2
J. S. DAWSON, Lower Bredbury, near Stockport (accepted)	7,148	18	1

## CROYDON.

For street works in Chalfont Road, South Norwood, and The Retreat, Thornton Heath.

### Chalfont Road.

Lawrence & Thacker	£423	19	10
Streeter Bros.	353	0	0
E. Iles	315	0	0
A. Bullock	313	0	0
Fry Bros.	290	0	0
W. PEARCE, David's Road, Forest Hill (accepted)	282	0	0

### The Retreat.

A. C. Soane	549	0	0
Lawrence & Thacker	514	13	0
W. Pearce	429	0	0
E. Iles	412	0	0
Streeter Bros.	402	0	0
Fry Bros.	399	0	0
A. BULLOCK, Tanfield Road, Croydon (accepted)	389	0	0

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HARDMAN & JONES, Devonshire Road  
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For erection of lavatory at Millfield House schools. Mr. A. A.  
KEKWICK, architect, 18 Outer Temple, Strand.  
T. G. Sharpington . . . . . £335 0 0  
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\* Accepted subject to their references proving satisfactory.

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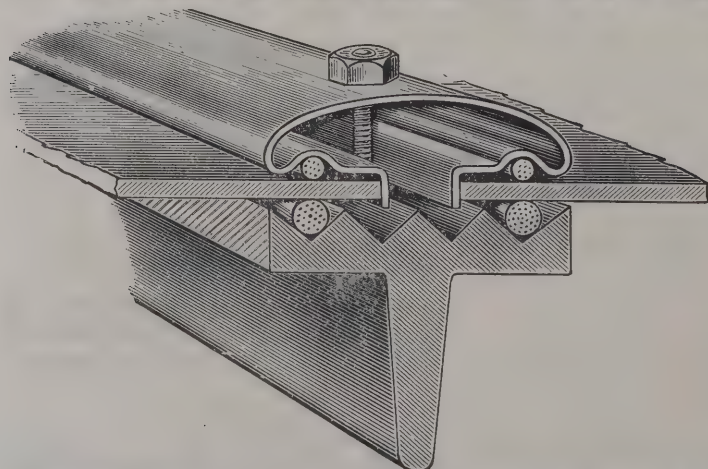
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T. FREE & SONS, Maidenhead (accepted) .

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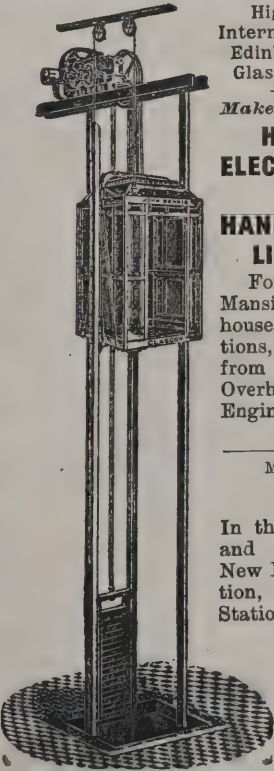
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For laying cast-iron water-mains, with valves, hydrants, &c., and the erection of a water tower tank and engine-house, fixing and provision of pumping machinery, oil-engines, &c. Mr. GEORGE WINSHIP, engineer, Borough Buildings, Abingdon.

Kingerlee . . . . .	£8,887	0	0
Bartlett Bros. . . . .	7,866	0	0
J. Peattie . . . . .	7,760	0	0
Johnson & Langley . . . . .	7,393	18	9
H. Shaw . . . . .	7,268	0	0
Dixon & Fish . . . . .	7,074	4	0
J. H. Vickers . . . . .	6,991	0	0
H. Roberts . . . . .	6,950	0	0
A. G. Osenton . . . . .	6,879	0	0
T. Rowland . . . . .	6,771	0	0
W. Manders . . . . .	6,763	11	0
S. Wood . . . . .	6,680	0	0
D. Young . . . . .	6,639	1	7
Gill & West . . . . .	6,543	13	7
Porter . . . . .	6,279	0	0
P. W. Symons . . . . .	6,242	0	0
ROWELL & SONS, Chipping Norton ( <i>accepted</i> ) . . . . .	5,962	5	10

**WITHINGTON.**

For erection of a chimney and additions to boiler-house, with boiler seating, &c., at the workhouse, Withington, Lancs.  
M. WARRINGTON, 129 Ashton Road, Hyde, near Manchester (*accepted*).

**WOLVERHAMPTON.**

For sewerage and street works in completing a continuation of streets off Tottenhall Road.

G. Trentham . . . . .	£1,190	0	0
J. Owens . . . . .	974	4	0
H. Holloway . . . . .	965	18	8
W. H. READING, Wolverhampton ( <i>accepted</i> ) . . . . .	936	6	9

**WORTHING.**

For erection of isolation pavilion at Swandean.

Snegin & Son . . . . .	£1,305	0	0
A. Crouch . . . . .	1,277	0	0
W. W. Sandell . . . . .	1,257	0	0
BLAKER & SON ( <i>accepted</i> ) . . . . .	1,211	10	0
Surveyor's estimate . . . . .	1,175	13	4

**TRADE NOTES.**

THE Middlesex County Council have accepted the tender of William Griffiths & Co., Ltd, for the construction of the new light railways at Tottenham, Wood Green, Highgate and Finchley.

THE additions to the Joint Infectious Hospital, Burnley, are being warmed and ventilated by means of Shorland's double-fronted patent Manchester stoves, with descending smoke flues and patent Manchester grates, those previously supplied having proved very satisfactory.

A LARGE clock has just been erected at the town hall, Retford. It shows the time on four 6-feet dials, chimes the Cambridge quarters and strikes the hours. The clock has been made by John Smith & Sons, Midland Clock Works, Derby, to the designs of Lord Grimthorpe. The same firm are also making a large clock for Docking Church, Norfolk.

THE Columbian Fireproofing Company, Ltd., of 37 King William Street, E.C., have obtained the contract for fireproof floors and roofs for the electric generating station at Greenhill, for the Oldham Corporation, the architect in this case, as in

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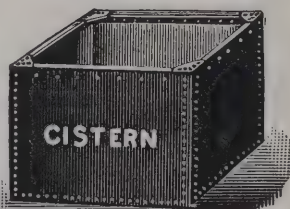
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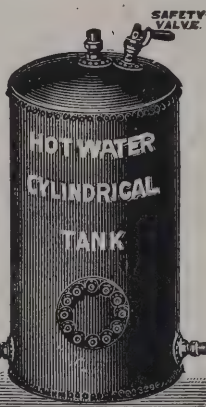
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hat of the power-house for the Kirkcaldy Corporation, being Mr. C. Stanley Peach, of 28 Victoria Street, S.W.

THE vicar, wardens, sidesmen and inhabitants of Askrigg, North Yorks, having decided to erect a first-class public clock in the tower of their parish church to commemorate the Coronation, the order was placed with Messrs. W. Potts & Sons, clock manufacturers, of Leeds and Newcastle-on-Tyne, and the work was dedicated on the 30th ult., Mr. Lodge, one of the churchwardens, setting the clock in motion at 7 P.M.

## CORRESPONDENCE.

### London Miniature Bisley, 1903.

SIR,—The keen interest which recent events have created in rifle shooting and the impetus which has consequently been given to the formation of rifle clubs throughout the country are facts with which you are doubtless familiar.

Owing largely to the difficulty of obtaining long ranges civilians have been compelled to resort to the use of miniature weapons and ranges, and so accustom themselves to, and perfect themselves in, this description of shooting. In order to encourage this departure and stimulate greater enthusiasm in rifle shooting generally the executives of the Society of Working Men's Rifle Clubs and the British Rifle League have appointed a committee to arrange for the holding of what may be called a miniature "Bisley" at the Crystal Palace, London, S.E., in March next, and the following rules and regulations have been provisionally decided upon:—

1. That the competition shall be open to all civilian and Volunteer riflemen, whether members of a rifle club or not.
2. That as it is not intended to make a profit out of the meeting, the entrance fees for the various events shall be nominal.
3. That miniature and other rifle clubs may send as many representatives as they please.
4. That there shall be no restrictions as to the general use of weapons, any rifle using Morris tube or other miniature ammunition being eligible.

The length of range will be 25 yards in each event, and stationary, moving and disappearing targets will be used, and various novel conditions introduced, bearing as much as possible on minor but important lessons derived from the late war.

Several valuable trophies have already been offered, includ-

ing the Society's trophy, the Gamage 100-guinea shield, the Sandow 40-guinea bowl, the "Regiment" cup, Messrs. Buck & Co.'s cup, Messrs. Paterson's trophy, and numerous gold, silver and bronze medals.

The value of the miniature rifle as a means to training has been so frequently demonstrated that we hope this effort to bring its uses and advantages more prominently before riflemen in all sections of the community will receive your sympathetic support.

All communications respecting the meeting should be addressed to the Joint Secretaries, "London Miniature Bisley, 1903," 17 Victoria Street, Westminster.—I am, dear sir, yours obediently,

FRED LANCE, Lieut.-General,

Acting chairman of the committee,  
Society of Working-men's Rifle Clubs.

## ELECTRIC NOTES.

At a special meeting of the Irvine Town Council, it was resolved to apply for a provisional order to supply electricity in the burgh and to acquire property and execute the works necessary for carrying-out this purpose.

At a meeting of the Malvern District Council, Mr. F. A. Moerschell (chairman of the lighting committee) stated that tenders had been received for the various things required in connection with the supply of electric light in the district. He was pleased to inform the Council that the amounts were such that the total cost of the undertaking would be something like 14,000*l.* instead of 17,000*l.*, the original estimate.

## NEW HIGHER ELEMENTARY SCHOOL, FINCHLEY.

In response to an invitation issued by the Finchley School Board, eleven selected architects submitted designs for the Higher Elementary School proposed to be built by the Board. Mr. Thomas E. Collcutt, F.R.I.B.A., the assessor, having made his award, the sealed letters accompanying the plans were opened, when it was seen that the first premium had been awarded to Mr. W. G. Wilson, A.R.I.B.A., Bloomsbury Mansion, Hart Street, W.C.; the second to Mr. G. E. T. Lawrence, A.R.I.B.A., Chandos Chambers, Strand, W.C.; and the third to Messrs. Mitchell & Butler, 16 Finsbury Circus, E.C. In terms of the conditions issued to the competitors the Board have instructed Mr. Wilson to proceed with the work.

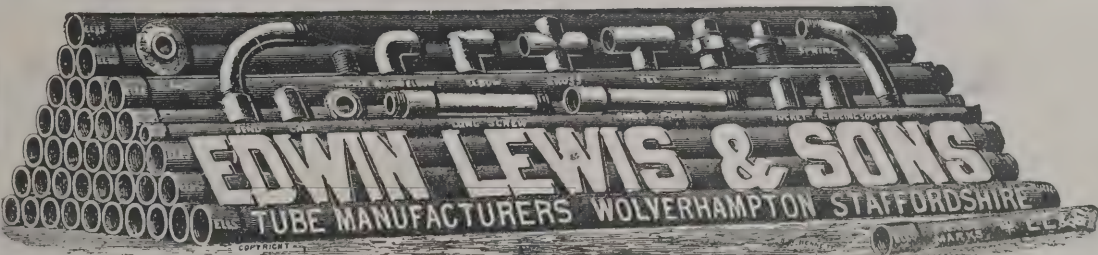
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## VARIETIES.

THE newly-built Congregational chapel at Stainton, near Dalton-in-Furness, has been opened.

WREXHAM parish church has just been restored at a cost of 10,000*l*.

THE Countess of Dudley has opened the new wing of the Cottage Home, Kingstown, which was designed by Mr. Kaye Parry, architect, and erected by Mr. Frazer, contractor, Bray.

THE new church of St. Mark's, Plumstead, was consecrated on the 1st inst. by the Bishop of Rochester. It has accommodation for 800, and has cost 6,200*l*.

THE contractors of the Simplon Tunnel have asked for the contract time to be extended by fourteen months owing to the unexpected difficulties met with in the work.

ST. PETER'S Church, Fairfield, Buxton, now enlarged by the addition of a north and south transept, nave, organ-chamber, vestry and chancel at a cost of 3,000*l*, has been consecrated by the Bishop of Southwell. There was an ancient chapel on the site in 1595. Towards the outlay 1,700*l*. has been raised. The Bishop gave 50*l*. and the collection realised 20*l*. Mr. Samuel Gratrix, of Manchester, was a donor of 200*l*.

ALBERBURY (Shropshire) Church was reopened on the 30th ult. after complete internal and external restoration. A fine old fourteenth-century oak roof, which had fallen much into decay, has been renovated, the organ has been enlarged, and the stonework of the edifice both outside and inside has been put into good repair. The total cost has been 870*l*. The architect is Mr. A. E. Lloyd Oswell, of Shrewsbury.

THE hospital at Darnley has just been considerably enlarged by the district committee of Upper Renfrewshire and the burghs of Barrhead and Pollokshaws, who are the joint proprietors. To the administrative block there has been added a board-room, matron's parlour, five nurses' bedrooms and waiting-room. A new pavilion, containing four wards with twenty beds, has also been built. Various improvements have been made on the old pavilions, and the total cost is estimated at about 6,500*l*.

THE Bishop of Colchester has dedicated the nave of a new church which has been erected to serve the Bernard's Heath district of St. Albans, and as the headquarters of the St. Albans Diocesan Mission. Seven years ago on Saturday the chancel portion was dedicated, and an iron building attached was used as a nave. Recently Mr. F. Taylor, of Bucknalls, near

St. Albans, offered 5,000*l*. to build the nave and thus complete the church, and the offer having been accepted, work was at once commenced. Various other sums were raised, and the chancel was embellished with carved clergy and choir stalls.

THE new tower and bells of the Leamington parish church were dedicated on the 30th ult. by the Bishop of Worcester. The erection of the tower marks what is practically the last stage of the important scheme by which the church—planned fifty years ago on ambitious lines, but for a long period left in an incomplete condition—has become one of the handsomest churches in the county. The height of the new tower to the top of the pinnacles is 140 feet. In it have been rehung the bells which have been silent since the wooden belfry from which they were for a long time rung was condemned as unsafe and taken down, and the original peal of six has now been increased to the full octave. The architectural style of the new tower is Perpendicular. The entire work has been carried out by Messrs. G. F. Smith & Sons, under the supervision of the architects, Sir Arthur Blomfield & Sons.

AT the Carpenters' Hall, London Wall, under the presidency of Sir James Crichton-Browne, the Sanitary Inspectors' Association met together on the 1st inst. for the purpose of receiving the address of the chairman for the ensuing year, Mr. Young. The latter reminded his hearers that it was upon the faithful and intelligent discharge of their duties that the health of the community depended. He urged that as those duties had in the past been performed with signal advantage to the public, the sanitary inspectors were entitled to the like security of tenure of office as enjoyed by their co-workers in public health in the Metropolis, the medical officers of health. Looking back through the nineteen years that the Association had existed, he said that two questions had always been consistently advocated, viz. that an inspector should have had a practical training for his work, and that he should have passed a qualifying examination. Personally he was always in favour of having their various societies united in one strong body, and he was always ready to make any personal sacrifice to bring such a desirable object about.

THE new nurses' home, which has just been completed, adjoining the Wednesbury Road, Walsall, and within the grounds of the District Hospital, was opened on the 30th ult. by the mayor (Councillor W. J. Pearman-Smith). The new building, which has been designed and carried out under the

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supervision of Messrs. Bailey & McConnal, is of red brick, with terra-cotta dressings. It is in Queen Anne style, and will be a decided acquisition to this part of the town. The builder is Mr. Mallin, of West Bromwich, and the structure is a credit like to the architects and the contractor. The basement, just above the level of the Wednesbury Road, is to be used as a department for out-patients, the number of whom has grown so rapidly of late years, whilst the rest of the building, the next floor of which is on a level with the high ground behind, is to be devoted entirely to the use of the nurses, who will be able to walk straight into the day-rooms from the hospital without any climbing of stairs. There are no fewer than twenty-three bedrooms, in addition to sitting-rooms and every convenience that sanitary science can devise. The cost of the building has been 6,116*l.*, and adding for furnishing 420*l.*, the total expenditure has been 6,536*l.*

## BUILDING AND BUILDERS.

THE foundation-stone has been laid of the new church of St. Silas, Ivy Hill Road, Nunhead. The church, when complete, will afford seating accommodation for 700 persons.

WORK has been commenced on the new lighthouse at the end of the pier extension, Folkestone. It will be a splendid structure, built from Cornish granite.

THE Bridgewater Trustees are now extending the picturesque black and white courthouse in the centre of the village of Worsley by adding another wing to it, the accommodation having become inadequate.

THE contract for the new Primitive Methodist school at Lightbourne, Moston, Lancs, has been let for the sum of 1,400*l.* It is seven years since the Primitive Methodist body erected an iron structure in this particular district, but in consequence of the great increase of the population the building has become too small. Already there are 300 children in regular attendance.

A STEEPLEJACK named John Gouldie met with a serious accident at the furnaces, Clyde Ironworks, where he was employed. Gouldie was in the act of putting hoops round the furnaces at a considerable height, and was standing on a gas pipe 4 feet in diameter, when he slipped and fell 25 feet, fracturing three ribs and otherwise sustaining severe bruises. He was taken to the Royal Infirmary.

At a special meeting of the Brigg Urban District Council to consider the proposed town drainage scheme, it was stated that tenders had been received to carry it through at a cost of 6,000*l.* to 9,000*l.* This exceeded the amount the Council were authorised to borrow, and it was decided to proceed with part only of the scheme, including the outfall works, pumping station and the drainage of the Grammar School Road and Glebe Road. It was also decided to ask the contractors to give separate tenders for this portion.

THE Stockport Guardians have decided to ask the Local Government Board to sanction a loan of 50,000*l.* for a new infirmary. The infirmary is to be erected on a site secured at Stepping Hill on the adopted plans of Mr. W. H. Ward. Provision is made for fifty-eight beds and an administration block. Canon Moloney, the chairman of the new infirmary committee, stated that about 39,000*l.* would be borrowed on a thirty years' loan. The estimate included site for boundary walls, road-making and teaching apparatus.

At a meeting of the Port Glasgow Town Council, Provost M'Master presiding, the town clerk submitted a draft of the improvement scheme under the Housing of the Working Classes Act 1890, as revised by Parliamentary agents. The estimated cost of the scheme, as prepared by Mr. Robert A. Bryden, Glasgow, is 29,200*l.* The Provost moved and Bailie Buchanan seconded that they approve the scheme. This was unanimously agreed to. The foregoing amount includes the sum of 10,000*l.* given by Mr. W. T. Lithgow, shipbuilder, towards the scheme.

At the monthly meeting of the Whitby Urban Council on Tuesday night it was decided to invite Messrs. J. H. Harrowing and W. H. S. Pyman, the local representatives on the North Riding County Council, to attend the next meeting of the highways and sanitary committee of the Whitby Council, with a view to giving the Council such information as might lead to a satisfactory decision upon the new bridge scheme when that matter next comes up for consideration by the bridges committee of the County Council.

THE engineer of the Walthamstow District Council is preparing plans for artisan dwellings which could be erected on the basis that the rents would be from 5*s.* 6*d.* to 7*s.* 6*d.* per week. The price of the land is reckoned at 500*l.* an acre, and the time for the repayment of the loan forty years at 3 per cent. interest. The Council has decided to borrow 100,000*l.* from the Public Works Loan Board at 3½ per cent. interest, repay-

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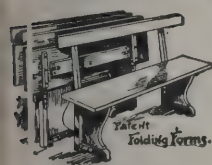


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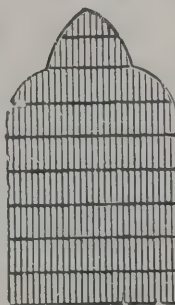
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THE CLOTHWORKER'S HALL: THE GREAT HALL.

HOUSES AT BERKHAMSTED.

THE BAR: TROCADERO RESTAURANT.

WEST FRONT: NATIONAL SCHOOLS, HADLEIGH, SUFFOLK.

CATHEDRAL SERIES: HEREFORD.—THE CLOISTERS AND THE  
LADYE ARBOUR. THE VICARS' CLOISTERS.

able within thirty years, for the purpose of advances under the Small Dwellings Acquisition Act, 1899. Several applications from working men for loans have been received.

A LOCAL GOVERNMENT BOARD inquiry was conducted by Colonel W. R. Slack, R.E., recently into the modified scheme for the provision of a highways depôt at Cheston Road, Aston. Two years ago the Aston District Council obtained powers for borrowing 12,690*l.* for this purpose, but as the result of the sale of a portion of land and the adoption of a less pretentious scheme, they now came forward with a request for borrowing powers for 7,634*l.*, in substitution for the larger sum. The facts of the position were explained to the inspector by Mr. Joseph Ansell (clerk), who stated that the original scheme sanctioned the construction of fifteen cottages fronting Cheston Road, intended to be used for the employés of the Council. Generally, all the arrangements contemplated by the first scheme were larger and more expensive than that suggested by the revised proposals. When the Council came to deliberate on the question they arrived at the conclusion that it would be unwise to spend large sums of money in the erection of these cottages, which ultimately would have to be let at such a sum as would involve an expense upon the rates, and that this would be better left to private enterprise. Thus, instead of spending 3,200*l.* on the cottages, the Council were spending 715*l.* on a foreman's house and the horsekeeper's cottage. The

original site was 12,000 square yards in extent, but finding that they could do with less area the Council sold 3,000 square yards and 980 yards frontage to the Electric Ordnance Accessories Company. Altogether, said Mr. Ansell, there was a saving of 5,000*l.* on the buildings, in addition to which the sale of the land realised 3,383*l.* Mr. Ansell remarked that in his long experience the application for a reduced sum was unique. Colonel Slack: It is my first experience of this kind of thing. It is generally the other way about—authorities asking for more. Mr. Ansell remarked that at a time when so much was being said about municipal socialism Aston took a little credit to itself for having done what they thought was the right thing in the interests of the ratepayers, and saved a very considerable sum. Subsequently Colonel Slack visited the site of the proposed depôt.

## A NEW PROCESS FOR MAKING STOCK BRICKS.

ON Tuesday last, on the invitation of Messrs. Eastwood & Co., Ltd., of Belvedere Road, Lambeth, a party numbering about 200 architects, surveyors, builders and other experts in and users of bricks proceeded by special train to Sittingbourne to inspect the practical working of an invention which promises to revolutionise the manufacture of stock bricks.

Arrived at Sittingbourne, or rather Teynham, which is the station beyond, the party first visited Messrs. Eastwood's works in the station-field, where brickmaking on the old plan was going on. Here conveyances were waiting in which visitors were driven to Conyer, where the new plant has been installed.

The new system is the invention of Messrs. Möller & Pfeifer, of Berlin, with whom Messrs. Eastwood & Co., Ltd., have entered into a contract whereby they obtain on terms the sole right to use their dryers and kilns within a radius of 80 miles from Charing Cross. They have also undertaken the agency outside this area for the whole of Great Britain and Ireland. It will readily be conceded that a process which insures rapidity and perfection of manufacture, which, of course, also means reduction of cost, would be welcomed by a firm whose output of bricks last year amounted to upwards of 120,000,000, and such a process they certainly seem to have found in the one under discussion, as by its means four days suffices for the whole process of manufacture from the filling of the mould to the issue from the kiln of a perfectly formed, thoroughly burnt stock brick. There is practically no waste, as the proportion of stocks per burning

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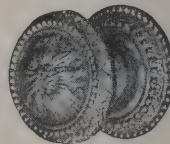
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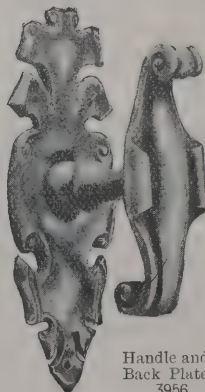
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averages 85 per cent., and when some trifling modifications in the system have been made it is expected to attain to as high as 97 per cent., against the 50 per cent. average under the old-fashioned method, while as the whole process from start to finish is carried out under cover it is entirely independent of the weather conditions, which have hitherto been an important consideration in brickmaking. The process in question is briefly as follows:—

The moulds, in sets of six, are filled and pressed by machinery and delivered to attendants, who place the bricks on specially constructed trucks, each holding 240 bricks. The trucks, when filled, are taken into the drying shed, which is heated by exhaust steam. Here, still on the trucks, the bricks remain for twenty-four hours, at the end of which time they are thoroughly dry and ready to be taken on the same trucks to the mouth of the kiln, where they are loaded on to a kind of waggon which fits, and, in fact, forms part of the bottom of the kiln, into which, when loaded, it is pushed, and by its entry forces out at the other end of the kiln—which, by the way, is 180 feet in length—a similar carriage with its complement of bricks, which, having been in the kiln for three days, are now thoroughly burnt as above mentioned. As Messrs. Eastwood & Co. explained, the present installation was made for purely experimental purposes, but they are so satisfied with the results that a considerable and speedy augmentation of the plant is in contemplation.

### LIVERPOOL ENGINEERING SOCIETY.

THE first meeting of the twenty-ninth session of the Liverpool Engineering Society, which was held on Wednesday evening at the Royal Institution, was attended by a representative gathering of members. Mr. Ernest S. Wilcox, M.Inst.C.E., the newly-elected president, delivered his inaugural address, dealing principally with a review of the major steps in the progress of engineering works which had been carried out in the port and city of Liverpool since the formation of the Society in 1875. In regard to the port, he gave an interesting account of the work of dock construction and improvement during the past twenty-seven years, and also of the dredging operations which had resulted in the removal of the bar formerly existing in the river. Beginning in 1890, he said, this latter work had been ceaselessly carried on ever since, resulting up to July 1 of this year in the removal of 27,866,590 tons of sand from the bar

and 34,800,930 tons from the Queen's and Crosby channels, and giving a depth of water on the bar, at low water of spring tides, of about 27 feet for a width, he believed, of about 1,500 feet. And what had resulted from that could not be estimated in value to the port and city. The lengthening of the landing-stage, building of the river-side station, bringing of the largest vessels alongside the stage, and the despatch of all their passenger and mail business there with the least possible delay, had all combined to emphasise the commanding position that the port of Liverpool held, and the fact that the ratepaying tonnage had increased to 6,763,768, 8,421,339 and 10,021,725 in the years ending July 1, 1880, 1890 and 1900 respectively, showed that it was one from which there could be no fear that she would be deposed. For the work went on, the energies of those in authority were apparently inexhaustible, and the engineering spirit which had so distinguished the dock estate for many years past was unabated. Dealing with the chief works accomplished in the city during the period under review, the President referred to the laying of roadways and streets, the initiation of the tramway systems, the Vyrnwy Waterworks, and the large reconstruction of sewers that had been carried out in recent years. Alluding to railway progress in the city and port, he traced the history of the improvements and extensions effected by the various companies, and made special reference to the Mersey Tunnel Railway and the Liverpool Overhead Railway. Both of these, he remarked, were making fresh bids for popular support, and they hoped that the pluck and perseverance shown in each case might result in the attainment of a fair and proper return on the outlay.

On the motion of Mr. J. A. F. Aspinall, seconded by Professor Hele-Shaw, a hearty vote of thanks was accorded the President for his address, after which the proceedings terminated.

### RICHMOND ASYLUM, DUBLIN.

AN inquiry was held by Mr. P. C. Cowan, chief engineering inspector to the Local Government Board, at the Richmond Lunatic Asylum on Monday, with reference to the application of the joint committee for the sanction of a loan of 39,270*l.* for the purpose of completing the building of the auxiliary premises at Portrane.



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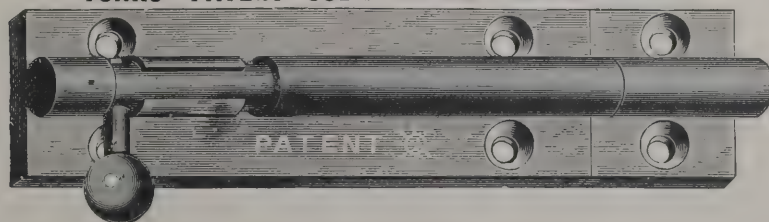
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Dr. Conolly Norman, medical superintendent, examined, gave details of the various loans obtained from the Board of Works for the equipment of the Portrane Asylum. The loans obtained were in almost all cases insufficient to meet the outlay. The first loan was one of 19,308*l.* 3*s.* 9*d.* for the purchase of the ground—470 acres—and of this sum 4,620*l.* was standing to their credit. In 1896 they obtained a loan of 208,300*l.* for the heating, erection, &c., of the building. All this money was expended, and it was expected that an additional sum of 1,200*l.* would be required. The electric lighting, laundry, plant, &c., cost 11,700*l.*, and this loan was all expended. The cost of the buildings altogether, including the water supply, would be 356,000*l.*. He was of opinion that the sum of 313,860*l.* would be sufficient to complete the buildings, but, roundly speaking, in order to have a contingent sum, 356,000*l.* would be the sum necessary. The accommodation at Portrane was for 1,200 permanent patients, and for 400 temporary patients, and the total cost for the 1,600 patients would be 270*l.* per head, including the water supply.

Mr. Dillon: You have made some comparisons with English and Scotch institutions?—Yes. In Scotland, in the Lanark Asylum, the cost was 445*l.* per bed, and the number of patients between 600 and 900; at Glasgow the cost was 421*l.* per bed for 613 patients; at Govan 481*l.* per bed for 520 patients. In England the figures were—Cheddleston, 428*l.* for 618 patients; in Claverley, 284*l.* for 2,050 patients; in Middlesex County, 311*l.* per head for buildings alone.

To Mr. Cowan: The cost in Portrane was 52*l.* per bed for temporary and 270*l.* for permanent patients, including water supply.

Mr. Dillon: That shows that the cost here contrasts favourably with that applicable to other places?—Yes, that is unquestionably the fact. They were overcrowded by three or four hundred. There were in the prison about 100 women, and they had had as many as 400.

You would like to get out of the Richmond Lunatic Asylum 400 patients and to get rid of the prison?—Even that would be a temporary expedient.

You would soon have your Richmond and Portrane Asylums filled?—We might, perhaps, have temporary accommodation for 400 more. The prison was very gloomy, the rooms were small and supervision was difficult, especially for administrative purposes. The accommodation in Richmond Asylum and Grangegorman was 1,600. The same amount of accommodation was provided at Portrane. At the present rate of in-

crease there would not be a bed to spare in a few years. They could accommodate 1,200 patients in the Richmond, 400 in Grangegorman, 1,200 in the permanent building and 400 in the temporary building at Portrane. There were at present altogether 2,600 patients in the asylum.

To Mr. Shannon: The cost of the site at Portrane was about 10,000*l.*, with about 800*l.* for costs. A comparison with the cost in Scotland was not unfavourable to Portrane.

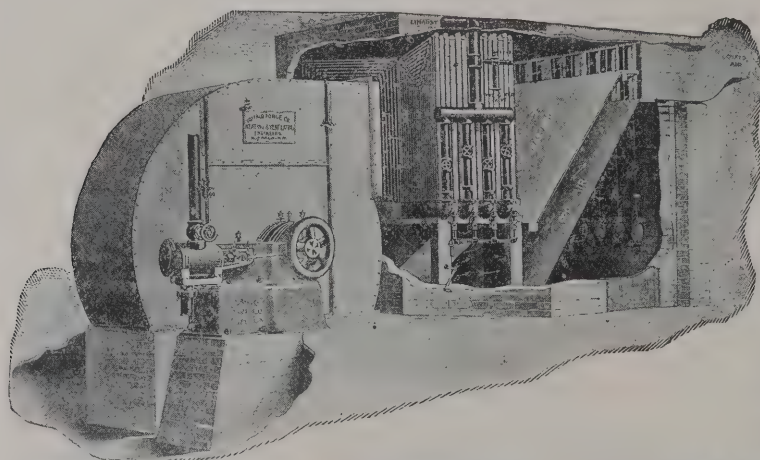
Mr. J. J. Doyle, accountant, handed in a statement showing the financial position of the asylum committee on taking over the Institution, from which it appeared that the Board of Control had provided a much less sum than was necessary to meet works for which contracts had been placed. The chief items were—heating and ventilation, contract 15,830*l.*, actual cost of work 16,943*l.*, amount provided, 7,000*l.*; plumbing and fire mains, contract 7,589*l.*, actual cost 9,353*l.*, amount provided, nil; drainage and rain-water tanks, contract 7,400*l.*, actual cost 9,500*l.*, amount provided 5,000*l.*; water supply, actual cost 13,468*l.*, amount provided 6,750*l.*; electric light, laundry and kitchen, contract 15,405*l.*, actual cost, 16,448*l.*, amount provided, 11,700*l.*. No provision whatever had been made for extras on building contract, or for minor works, roads, furnishing and equipment, which amounted to a very large sum. Of the total cost of 279*l.* per bed in Portrane in permanent buildings, 24*l.* was chargeable to water supply, while the corresponding figures in Scotch and English asylums were as follows:—Lanark, 445*l.*; Glasgow, 421*l.*; Govan, 481*l.*; Chichester, 328*l.*; Cheddleston, 428*l.*; Claybury, 284*l.*. The last-named asylum has 2,050 patients, while Portrane has only 1,200, and, of course, the higher the number of patients the lower the average cost per bed. The cost per bed in temporary buildings in Manor Asylum, London County, was 170*l.*, while in Portrane it was only 52*l.*

Mr. Dillon, solicitor, said the figures were important, in view of the charges of extravagance which had been made against the Portrane Joint Committee.

Mr. Shannon, solicitor, said the rate for lunatic asylums had gone up from 2*d.* to 5½*d.* in the pound in Dublin within the last five years, and the feeling of the ratepayers was that any work which was not absolutely necessary should not be undertaken at present, and that as much as possible should be done by patients' labour.

Other evidence having been given,

The Inspector said that he would make his report to the Local Government Board in due course.



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**WALSALL SEWERAGE SCHEME.**

A PUBLIC inquiry on behalf of the Local Government Board was held on the 29th ult. at the Guildhall by Colonel W. R. Slacke, R.E. (Government inspector), relative to an application by the Walsall Town Council for powers to borrow 2,250*l.* for experimental works of sewage disposal at the Brockhurst Sewage Farm, the Delves (in the borough of Wednesbury). The Corporation was represented by Mr. J. R. Cooper, town clerk, and Mr. R. Middleton, borough surveyor, and there were also present, Councillor J. Noake, the mayor-elect (chairman of the sewage-farm committee), Councillor J. H. Roberts (vice-chairman), Alderman Clare and Councillors S. Drew, S. J. Hawley, R. C. Thomas, E. H. Ingram.

In the first place the Inspector asked if there was any opposition; but there was no response, and the town clerk remarked that the Corporation did not know of any.

The Town Clerk, in opening the case for the Corporation, said that since 1891 the population of Walsall had increased at the rate of 20 per cent. There had been no extension of the borough for twelve years. The area was 17,358 acres, and the rateable value 272,145*l.* for the purposes of the poor rate, and the assessable value for district rate was 219,535*l.* The amount of outstanding loans and stock chargeable upon the district fund for sanitary purposes was 217,489*l.* 12*s.* 1*d.* The sewage farm was the freehold property of the Corporation, and comprised 175 acres. It was established in 1882. At that time the Corporation adopted a system of dealing with their sewage by broad irrigation. Within ten years it was found that the land had become very much choked up with sewage and was no longer efficiently purifying it. The result was that in 1892 the Corporation went to the Local Government Board and obtained sanction to a loan of 8,750*l.* for the purpose of putting down sewage purification works, tanks and such like plant, first of all to deal with the sewage by chemical precipitation and then irrigate the effluent over land. In connection with that scheme the Corporation put down certain filter beds of polarite. The scheme at first, he believed, contemplated eight beds. The Corporation found the cost of constructing these very much beyond what was estimated, and they decided, on the advice that was given them, to put down only two small beds. After a few years' experience it was found that as to these filter beds, although the effluent was of a satisfactory character, it was not of such a character as the Local Government Board would be agreeable

to being discharged into the river. The water in the river was worse than the sewage effluent discharged into it, owing to the very large quantity of trade refuse finding its way into the tributaries of the river in the different districts through which they passed. When the Local Government Board gave the sanction for the loan of 8,750*l.* they foresaw that possibly the effluent would not be of a satisfactory character, and they made it a condition that the Corporation should discharge any effluent over land, and they required an undertaking that that should be done. That undertaking was given honestly in the belief that the Corporation would be able to give effect to it. But it was found that to discharge the effluent from those two filter-beds would require the laying of a drain through practically the whole of the length of the farm to the furthest boundary, and the under-draining of a field for the purpose of dealing with the effluent. That field was undrained, and this state of things was found to exist: that when the river was in flood and the land was most needed for the purpose of dealing with the effluent the drains were waterlogged and became inoperative, and the Corporation thought they would not be justified in constructing a drain from the filter beds to this piece of land. Consequently they had not been able to give effect to that undertaking. Sanitary science had been taking very great strides, and the Local Government Board themselves had advanced in their views as to what should be done with the effluents from sewage farms. He believed in certain cases they had listened to an effluent being turned into a river without being treated over land. Having to face the difficulty and deal with the increased volume of sewage which was being discharged at Brockhurst Farm, they applied themselves to considering what would be the best method of dealing with it. Within the borough boundary there was an outlying district, practically a separate town, called Bloxwich, with a population of from 12,000 to 14,000. At the Beechdale Farm, which dealt with the sewage of the Bloxwich portion of the borough, they had constructed some experimental works for the purpose of testing the bacteria process. Between 1,200*l.* and 1,500*l.* was spent in putting down works, which had been in operation for some years with eminently satisfactory results. The sewage from Walsall, however, included a great deal of manufacturing refuse, spent acid and such like things, which came from small factories in small quantities, and the question had arisen whereby the filter beds would deal with the sewage from Walsall in the same efficient manner as with

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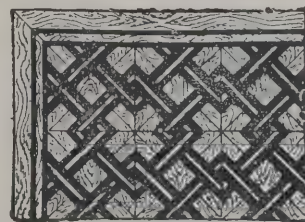
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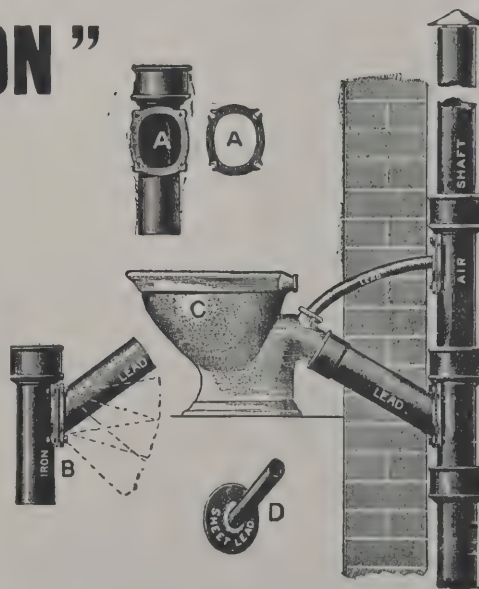
C—Shows the one size which can be adapted for 4 in. Soil Pipe, and a 4 in.  $\times$   $\frac{1}{2}$  in. Invert Junction for Anti-siphon Pipes, &c.

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the sewage from Bloxwich. It had, therefore, been suggested by the borough surveyor that before going to an expenditure of something like 75,000*l.* in putting down a complete bacteriological system at the Brockhurst Farm, the Corporation should first put down experimental beds, which might eventually become part of the complete system. This was felt to be the prudent course to adopt. They believed there was no other course open to them but to take up a system of that kind, provided it worked satisfactorily, however costly it might be. Unfortunately there was no land in the immediate neighbourhood of the sewage farm which was suitable for dealing with the effluent from the sewage works, consequently the only thing they could do was to economise what land they had by putting down bacteria beds. They would still have something like 60 or 70 acres of land over which the effluent could be irrigated after it was discharged from the beds. The Corporation had spent about 65,000*l.* in capital outlay in trying to find a system which should efficiently purify the sewage.

The Town Clerk, replying to the Inspector, said the Corporation undoubtedly would carry out the complete system as soon as they were satisfied the experimental works were a success. The proposed new system would save 600*l.* or 700*l.* a year in chemicals alone.

The Borough Surveyor gave details of the works, and

The Inspector said it seemed very much as if additional land would be required.

The Borough Surveyor replied that there was no land in the immediate vicinity of the sewage farm which he could recommend the Corporation to acquire.

The Town Clerk added that the lower the Corporation went down the valley the nearer they would be getting to the residential districts in the neighbourhood of Birmingham.

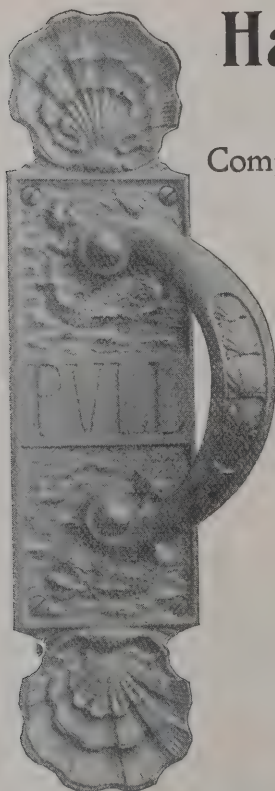
### SOUTHAMPTON HARBOUR IMPROVEMENT.

At a meeting of the Southampton Harbour Board on Tuesday it was decided to promote a Bill in Parliament in the session of 1903 to borrow the sum of 100,000*l.* for the purpose of deepening the harbour channels and approaches to 35 feet at low-water spring tides. The harbour and railway authorities are working most cordially together to further the interests of Southampton in connection with pending developments in the Transatlantic traffic. At the conference held between the authorities a few days ago the directors of the railway company informed a

deputation from the harbour board that they had already given instructions for two deep-water berths of 35 feet at low-water ordinary spring tide and one berth of 32 feet to be provided at the old extension quay at the docks, and that the work would be carried out forthwith. The directors suggested that the financial requirements of the harbour board in respect of the deepening of the harbour channels should be met by the corporation agreeing to forego the one-fifth of the dues at present receivable by them, and that the dues on the shipping using the port should be increased. An increase of  $\frac{1}{4}$ d. a ton on the shipping would realise about sufficient, with the relinquishment of the one-fifth by the Corporation, to meet the annual charges on the expenditure. In addition to the dredging work necessary to be done within the immediate jurisdiction of the harbour board there is a considerable area to be cleared at Thorn Knoll, just outside the Southampton Water, in order to provide a deeper channel from Southampton to the sea. The estimated cost of this portion of the work is put down at 25,000*l.*, and of this sum the railway company has offered to contribute 12,500*l.* The importance of proceeding with the work without delay is fully realised in the port, for it is now known that the international mercantile marine intend to largely increase the amount of business done by the American Line steamers at Southampton, and a largely increased traffic is anticipated from various other sources. The recommendations of the committee were agreed to, but the subject of the one-fifth of the dues which it is proposed the town shall relinquish will in due course be considered by the borough council.

### THE BIRMINGHAM ASSOCIATION OF MECHANICAL ENGINEERS.

THE first meeting of this Association for the present session was held at the Grand Hotel on Saturday evening last, Mr. G. Conaty (president) in the chair. A paper was read by Mr. Hugo Gibson on "The Diesel Oil-Engine," which was illustrated by lantern views. Mr. Gibson, in commencing his paper, referred to the principles and methods of carrying out the utilisation of fuel as adopted by Herr Diesel, of Munich. The scientific principles were not new, he admitted, but in the application of these principles Herr Diesel had made a ladder wherewith to mount to the pinnacle of fame. After referring to the initial stages in the evolution of Herr Diesel's engine, the lecturer



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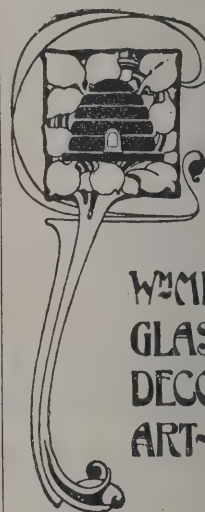
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enumerated the points which Herr Diesel had laid down for further procedure. The lecturer's information was taken from the Diesel engine installed by the Harrogate Corporation for the pumping of sewage, which he contended from figures submitted proved it to be a satisfactory and very economical working engine, more so than the majority of oil-engines, although the initial outlay might be more. This engine at Harrogate was, he thought, the only one of Herr Diesel's in Great Britain. The lecture, which was most interesting and instructive, was cordially received, and afterwards led to a well-maintained discussion, amongst which the following members and friends took part:—Messrs. Wright, Seaton, Robson, Sandwell, Hodgson, Batey, Talbot, Deakin and Richardson. After the lecturer had replied to the numerous points raised by the discussion, the evening was brought to a close by a unanimous vote of thanks to Mr. Gibson, proposed by the President, to which the lecturer suitably responded.

### BUILDING TRADES' EXCHANGE.

THE annual meeting of the Glasgow Building Trades' Exchange was held in the Exchange, Glasgow, on October 31, Colonel Bennett presiding. Mr. David Cook, writer, secretary, read the ninth annual report on the affairs of the Exchange. The accounts showed that there was a credit balance on the year's working of 17. os. 9d. While the Exchange was financially in quite a healthy condition, the report continued, a strong effort would require to be made to increase the income. Efforts should be directed towards endeavouring to increase the membership and to obtain a number of new exhibits for the ample-room. Towards the building fund of the new technical college the Exchange collected a sum of 653*l.* 3*s.* 6*d.* over and above the sums contributed by the hon. president and president, or, in all, a sum of 2,153*l.* 3*s.* 6*d.* In connection with the appointment of a commission to inquire into the housing question, the executive asked that Mr. James Goldie's name be added to the commission. This request was granted, and Mr. Goldie would keep the Exchange in touch with the inquiry. During the year a discussion was entered upon in Parliament with reference to a pernicious Bill prepared and brought in by Mr. Charles Dilke, artfully entitled "A Bill to Legalise the Peaceful Conduct of Trade Disputes," and in this connection

the executive caused their secretary to address a letter on the subject to most of the Scottish members of Parliament. The accounts were approved; Messrs. Paterson & Benzie, C.A., were appointed auditors, and a vote of thanks was passed to the chairman.

### VENTILATION OF FACTORIES.

THE first report of the departmental committee appointed to inquire into the ventilation of factories and workshops has been issued, with appendices, as a Blue-book. This states that the ordinary standard of cubic air space per person has been found to afford no sufficient guarantee of ventilation, and that a more reliable test would be by means of analysis of the carbonic acid in the air. The legal limit under the proposed test should be fixed lower than the ordinary working limit to allow for cases where the air has become temporarily vitiated. It is consequently recommended that, under the powers conferred by the Factory Act, 1901, such a standard of ventilation should be prescribed for all classes of factories and workshops not specially dealt with that the proportion of carbonic acid in the air at the breathing level shall not, except on foggy days, rise beyond 12 volumes of carbonic acid per 10,000 of air, except that when gas or oil is used for lighting the proportion shall not exceed 20 volumes after dark or before the first hour after daylight, the only exception to be where the extra carbonic acid is produced in other ways than by respiration or combustion, as in breweries, cotton-cloth factories with artificially humidified air having the option of coming under this operation. It is also recommended that inspectors of factories should inform employers of the results of official analyses, and that these proportions have been exceeded, and that no legal proceedings should be taken till, after a reasonable interval for remedying the defect, the proportion is found, on an average of two or more samples taken in different parts of the room, to be exceeded by one volume or more, and the employer is unable to show that he has taken measures reasonably calculated to secure the requisite ventilation. Arrangements are proposed to have the analysis of samples made for the Factory Department of the Home Office by a specially qualified person, and to supply inspectors, when desired, with a properly tested portable apparatus for estimating on the spot the proportion of carbonic acid in air.

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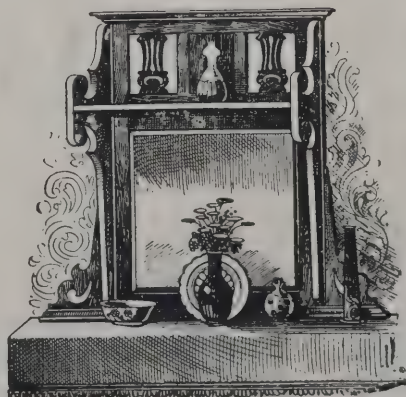
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**ADULT APPRENTICES.**

WE have already given an account of the treatment of a man aged twenty-five, who became an apprentice of Messrs. Wigg & Wright, builders, of Ipswich. Owing to the demand of the local society of operative stonemasons and others he was dismissed. He sought redress in the County Court, but the judge held there was no ground for action. The Divisional Court reversed that decision and ordered a new trial. The defendant society appealed, and judgment was given in the Court of Appeal on Tuesday.

The Master of the Rolls read the following judgment:— This is an appeal by the defendants from the decision of the Divisional Court ordering a new trial of a case decided by a County Court judge in favour of the defendants. There is a cross appeal by the plaintiff asking that this Court should give judgment for the plaintiff with damages. The Court below, while agreed that the decision was unsatisfactory, were divided as to the relief, Mr. Justice Darling and Mr. Justice Channell holding that there ought to be a new trial, while Lord Alverstone was of opinion that the plaintiff was entitled to judgment. The parties agreed before them and before us that if judgment were given for the plaintiff the Court should assess the damages. The facts are stated in the judgments as reported below, and I need do no more than summarise them for the purpose of this judgment. The claim was for 50% damages for wrongfully and maliciously inducing Messrs. Wigg & Wright to break their contract of apprenticeship with the plaintiff. The evidence for the plaintiff was that he had become bound by an indenture of apprenticeship to Messrs. Wigg & Wright, stonemasons, of Ipswich, whereby they undertook to teach him the trade of a mason, paying him wages of 15s. a week during a period of three years. Messrs. Wigg & Wright had in their capacity as masters agreed to certain working rules with the defendant society, one of which (6) was as follows:— "That boys entering the trade shall not work more than three months without being legally bound apprentice, and in no case to be more than sixteen years of age, except masons' sons and stepsons. Employers to have one apprentice to every four masons on an average." The plaintiff's father was a mason. The plaintiff was not a member of the society, and was twenty-five years of age when he entered into the indenture of apprenticeship. The defendant society in concert with the other defendants, on becoming aware that the plaintiff had been taken as an apprentice by Messrs. Wigg & Wright, took steps to enforce compliance by them with rule 6

as interpreted by the defendants by threatening in the language of their letter set out in Mr. Justice Darling's judgment:—"If the man in question (the plaintiff) starts working at the trade, we are bound to protest against you for introducing an individual not of the trade, and in accordance with our general rule we have empowered our members working for your firm to take prompt action in the matter. We regret the thing has occurred, but we feel that the blame does not rest on us in any way." This was in effect a threat that they would call out the workmen in Messrs. Wigg & Wright's employ, all of whom were members of the defendant society, and, as was explained by counsel, if so empowered, would be supported while off work out of the funds of the society. Messrs. Wigg & Wright disputed the construction placed by the defendants on rule 6, contending, and as I think rightly, that it did not extend to masons' sons. Feeling, however, that they could not resist the coercion brought to bear on them, they dismissed the plaintiff. It was not suggested before us that the acts complained of were not all done by the defendants in concert. The plaintiff has therefore lost the opportunity, which he was lawfully entitled to, of emerging from the position of a labourer at 15s. a week to that of a mason who may earn up to 35s., and he has brought his action accordingly. No evidence was called for the defendants and no proof given of assent by Messrs. Wigg & Wright to any rules other than those put in, of which rule 6 is one. On these facts the learned County Court judge held as follows:—"I hold that the facts as proved and admitted before me fall short of giving any ground of action against the defendants. The defendants seem to me to have acted bona fide in the best interests of the Society of Masons and not to have been in any way actuated by any improper motives. They gave a certain interpretation to rule 6 and acted upon it, and though their interpretation may or may not be correct, as it was honestly held, I do not consider they have acted improperly in their method of enforcing it." On these facts the case seems to me to be clear. The plaintiff was entitled to the benefit of the contract which he had made, and that benefit he would have continued to enjoy but for the intervention of the defendants. The object of the defendants' intervention was to deprive him of that benefit. The facts leave no room for doubt as to that. He was not a member of their society, and was under no obligation, legal or moral, to conform to their rules. In these circumstances they conspired to enforce by threats of a formidable character, which they had the means of carrying into effect, a breach by his employers

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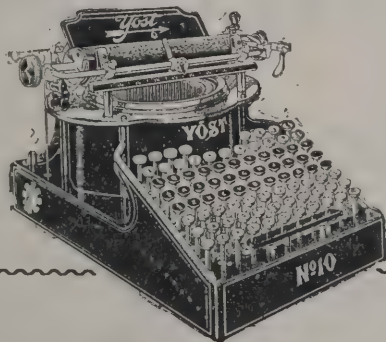
and instructors of the contract which the latter had with him; and the only justification they can suggest for this conduct is that Messrs. Wigg & Wright had come under an obligation to them, not perhaps legally enforceable, if not illegal, not to make such a contract as they had made with the plaintiff. But the justification to be of any avail must cover their whole conduct, the means they used as well as the end they had in view. As against Messrs. Wigg & Wright they had whatever rights within the law the rules assented to by Messrs. Wigg & Wright afforded them. But to combine to coerce them, by threats of the character I have described, to break their contract with the plaintiff was in my judgment an illegal act carried out by illegal means. They cannot be in a better position if the rules are unenforceable than they would have been had a breach of them given them a legal cause of action. But in such case how can they possibly justify taking the law into their own hands and compelling the opposing litigant by coercion to give effect to their view of a disputed obligation by breaking his contract with the plaintiff? Further, does not such conduct demonstrate that their object was to defeat the plaintiff's purpose of becoming a mason? Belief, however honest, that in what they did they were acting in the best interest of the Society of Masons could be no excuse for conspiring to deprive the plaintiff of the advantages of his contract. Persuasion by an individual for the purpose of depriving another person of the benefit of a contract, if it is effectual in bringing about a breach of the contract to the damage of the person, gives a cause of action ("Lumley v. Gye," 2 E. and B., 216); and a strong belief on the part of the persuader that he is acting for his own interests does not seem to me to improve his position in any respect. Still less can it do so when he does not confine himself to persuasion, but joins with others to enforce their common interests at the plaintiff's expense by coercion. "That a conspiracy to injure—an oppressive combination—differs widely from an invasion of civil rights by a single individual cannot be doubted" (see per Lord Macnaghten in *Quinn v. Leatham*, 1901, A.C., at p. 511, and per Lord Brampton in the same case, at p. 528, *et seq.*). It seems to me, therefore, that this case stands wholly outside the debateable ground traversed in the discussion of *Allen v. Flood* (1898, A.C., 1). The action of the defendants was as clearly malicious, or, if the phrase be preferred, "without just cause or excuse," as in *Lumley v. Gye*, which, as well as *Temperton v. Russell* (1893, 1 Q.B., 715), has been finally established in *Quinn v. Leatham* to be a binding

authority. "There are," says Lord Watson in *Allen v. Flood*, at p. 96, "in my opinion, two grounds only on which a person who procures the act of another can be made legally responsible for its consequences. In the first place, he will incur liability if he knowingly and for his own ends induces the other person to commit an actionable wrong. In the second place, when the act induced is within the right of the immediate actor, and is therefore not wrong as far as he is concerned, it may yet be to the detriment of a third party; and in that case the inducer may be held liable if he can be shown to have procured his object by the use of illegal means." This passage is approved by Lord Macnaghten and cited by him as embodying the opinion of the majority in that case. The present case inevitably falls under one or other of those propositions, and I think within both. The defendants did knowingly and for their own ends induce the commission of an actionable wrong, and they employed illegal means to bring it about. Such conduct would be actionable in an individual and incapable of justification *a fortiori* where the defendants acted in concert. These considerations seem to me to exclude from discussion in this case the illustrations given in argument of what might in given circumstances be "just cause," or, in other words, suffice to negative malice. There was no relation between the defendants and either of the parties in this case at all analogous to those existing in the instances put of father and child or doctor and patient, which I leave for solution when the case arises. The defendants have no higher immunity from legal obligations than any other members of the community, and if they have legal rights they can enforce them by legal means only. It is not at all necessary in this case to embark upon the question whether "without just cause" is a complete equivalent for what was meant in the common law by malice. I am inclined to think that, though in many cases adequate as a description, it is not coextensive with it, nor do I think that in civil actions any more than in criminal it will be possible to eliminate motives from the discussion. See the weighty observations of Lord Brampton on this point in *Quinn v. Leatham* at p. 524. It is, however, very desirable to guard against the notion that if the act done be illegal, "just cause" may still be averred to purge the wrong. For instance, where illegal means have been used to bring about the breach of a contract to the detriment of a party thereto, "just cause" cannot come into the discussion at all. The use of illegal means evidenced malice, and in this connection malice was not equivalent to "without just cause."



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The cause of intervention might be just, but the means used to enforce it might be illegal. The common law action threw the burden of proof on the plaintiff. It was not enough for him to show that the defendant had brought about the breach of a contract between a third party and the plaintiff. He had to show that it was done maliciously, and the burden of proving malice lay upon him. It was not a case of a *prima facie* cause of action based on the fact that a breach of contract had been brought about to the detriment of the plaintiff, party thereto, by a stranger to the contract. The common law did not lightly extend rights arising out of contracts to and against persons not parties thereto, owing to the absence of privity (see the cases collected in the notes to "Pasley v Freeman," 2 Smith's Leading Cases, 64). Some nexus had to be established between the plaintiff and the stranger, and this was found in malice. Unless the plaintiff could show this, he failed to bring the stranger into such relations with him as to ground a cause of action, and therefore the burden was upon the plaintiff to prove a cause of action, not upon the defendant to justify. I think some confusion has crept into the discussions on this matter through want of sufficient regard to these elementary points. I think the materials before us are sufficient to enable us to enter judgment, and I agree with the Lord Chief Justice that the defendants' appeal should be dismissed and the plaintiff's cross-appeal allowed, and judgment entered for the plaintiff for 50*l.* Judgment accordingly.

Lord Justice Stirling's judgment was as follows:—The evidence in this case establishes, in my opinion, that the defendants knowingly procured Messrs. Wigg & Wright to violate a contract which they had entered into with the plaintiff. In so doing the defendants acted without any improper motives; but I take the law to be as stated by Lord Macnaghten—"A violation of legal right committed knowingly is a cause of action, and . . . it is a violation of legal right to interfere with contractual relations recognised by law, if there be no sufficient justification for the interference." *Quinn v. Leatham* (1901, A.C., 495, at p. 510.) This proposition was not seriously questioned in argument, but it was contended on behalf of the defendants that there was a sufficient justification for their interference, because Messrs. Wigg & Wright had, previously to the contract with the plaintiff, entered into a contract with them, the defendants, which is said to be inconsistent with the contract between Messrs. Wigg & Wright and the plaintiff. Some difficulty appears to have arisen in the Divisional Court as to what the terms of this

contract were; but at the hearing before us counsel on both sides agreed and invited us to decide the case on the footing that the terms of this contract are contained in a printed document put in evidence which purports to be "working rules agreed to and signed by the employers and the operative stonemasons of Ipswich and district," and to have been signed by (amongst others) Wigg & Wright, as employers, and the president and other officers of the defendant society. It was contended in argument that this agreement was illegal as being in restraint of trade. As at present advised, I am not satisfied that this is so; but in the view which I take it is unnecessary to decide the point, and I shall assume for the purpose of the present judgment that the agreement between Wigg & Wright and the defendants was in all respects valid and binding. The particular clause relied on is rule 6:—"That boys entering the trade shall not work more than three months without being legally bound apprentice, and in no case to be more than sixteen years of age, except masons' sons and stepsons." This I refer to as the first part of the rule. It proceeds:—"Employers to have one apprentice to every four masons on an average." This I refer to as the second part of the rule. It is contended on behalf of the defendants that the first part of the rule prohibits employers from taking apprentices over 16 years of age, and if this were the true construction of the rule, and it were applicable to persons in the position of the plaintiff, there would be, to say the least, a serious question whether the justification set up by the defendants was not made out. But whatever the true construction of this part of the rule may be, it does not, in my opinion, apply to the plaintiff. He was a mason's son, and by the terms of this part of the rule masons' sons are exempted from the operation of this part of it. As regards the second part, it is not well expressed; but it may be read as prohibiting employers from having more than one apprentice to every four masons. If this be the true meaning, Wigg & Wright violated it. It is not every violation of these rules which would justify the defendants in what they did. It appears to be plain from the letter of May 22, 1901, that the defendants' ground of complaint against Wigg & Wright was not that they had two apprentices when they ought to have had only one, but that they had taken the plaintiff as an apprentice when his age was between 25 and 26. The objection that Messrs. Wigg & Wright had more than the proper number of apprentices might have been got over if they had entered into some arrangement by which the services of the other apprentice were transferred to another master. But the

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letter shows plainly that the defendants would not have been satisfied so long as the plaintiff was allowed to work at the trade. I think that the object of the defendants, as shown by that letter, was to prevent Messrs. Wigg & Wright from giving the plaintiff the benefit of his contract with them, and I find nothing in the rules which entitled them to insist on that. It was said, however, that the defendants acted in good faith and honestly believed that the true construction of the rules was different from that which it appears to me to be. But, in the absence of fraud, good faith is not of itself a sufficient defence to an action founded on tort, though it may in some cases be an essential element of such a defence. If an action is brought for a trespass to land and the defendant justifies under an alleged right of way, judgment must go against him if he fails to establish the right, however honestly he may have believed in its existence. If an action is brought for the publication of a defamatory matter and the defendant sets up that it was published on a privileged occasion, he will fail in his defence unless the privilege is established, however clear his good faith may be. I do not think that the present defendants occupy a better position than a defendant setting up privilege in an action for libel or slander, and as they fail to establish the existence of the contract on which they rely, I think that they fail in their defence. I desire to express no opinion on the important question whether, if the contract had been such as they believed it to be, they would have been justified in point of law in doing what they did. For these reasons, which appear to agree in substance with those given by the Lord Chief Justice in the Divisional Court, I think that the decision of that Court should be varied and judgment entered for the plaintiff.

Lord Justice Cozens-Hardy said:—I agree. The judgment of the Master of the Rolls, which I have carefully read and considered, so completely expresses my own views that I do not desire to add a word.

### PROPOSED BRIDGE ACROSS THE STRAND.

At the meeting of the Westminster City Council on Thursday the works committee submitted a scheme by Sir John Wolfe-Barry for the construction of a bridge across the Strand at the bottom of Wellington Street, so as to enable the north and south traffic to pass independently of the east and west traffic. Several years ago Sir John Wolfe-Barry read a paper before

the Society of Arts, and at that time he found upon calculation that the average delay of traffic in the Strand amounted to from 10 per cent to 45 per cent., that was to say, a conveyance proceeding towards the City, instead of taking 20 minutes, took 30 minutes during the worst period of the day. He explained to the committee that the traffic had greatly increased since that time, and when the new main thoroughfare connecting Holborn with the Strand was completed, that improvement would have the effect of still further increasing the block at the meeting-point of the two streams of traffic. Sir John Wolfe-Barry's solution of the problem is to make a street adjoining Wellington Street on its western side, starting from Tavistock Street, which would rise from that point to a gradient of about 1 in 30, to construct a bridge across the Strand with a headway of about 16 feet 6 inches, and to continue the roadway on the line of Lancaster Place, which should fall at a gradient of about 1 in 20 to 1 in 30 and join Waterloo Bridge at its northern end. He suggests that Wellington Street should remain as at present with a width of 50 feet, and that the new street should also have a width of 50 feet, the two streets running side by side at different levels. The scheme would permit of the building of shops along a considerable portion of the west side of Wellington Street, below the new street, and along the raised road there would also be a frontage of commercial value which would be of great importance in connection with the expense of the project. In the event of the Council's considering that the matter is one that should receive careful investigation by their own officers, Sir John Wolfe-Barry has expressed a desire to submit to those officers a more satisfactory plan than the one submitted, which has been hurriedly drawn. It appears to the committee that, before committing the Council to the scheme, it will be necessary to obtain reports upon its estimated total cost, including the promotion of a Bill in Parliament and the acquisition of property and buildings; upon the estimated return of lettings or sales, and upon the question of traffic and cross-traffic at the intersection of the Strand and Wellington Street, and then to consider whether the matter is not one to be dealt with by the London County Council, and, if so, whether that body should be invited to consider it. They recommend that the whole matter be referred to them jointly with the improvements committee, and that the two committees be empowered to obtain the reports and to consider the points above-mentioned with a view to a full and detailed report being submitted to the Council.

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**ELECTRIC POWER TRANSMISSION.**

THE president of the Engineering Society of the University of Birmingham, Professor Burstall, delivered an interesting address to the members on the 30th ult. on "The Transmission of Power." The address took the form of an account of the scheme intended to supply electricity for all purposes—lighting, traction and power—and at the same time to supply cheap gas for the purpose of heating, at a price of  $1\frac{1}{2}d.$  to  $2d.$  per 1,000, and equivalent to a lighting gas of the same quality at  $6d.$  or  $8d.$  per 1,000. This Professor Burstall proposed to achieve by the installation of gasworks in convenient places close to the pit mouths, where coal would be cheap, and cheap-produced gas might be made in large quantities and transmitted under pressure to localities where there was a demand for lighting and power. The loss through leakage, he considered, could be reduced to 1 per cent. with proper care. At the sub-stations, where a demand existed, there would be large gas-engines, which would convert the gas into a three-phase current at a pressure of 7,000 volts. This, again, would be converted to 440 volts for working tramways and to 220 volts for lighting on the three-wire system. At the same time the produced gas might be piped along the streets, and would be available for manufacturing purposes generally. The system would have the advantage of cheapness, by reason partly of a valuable fertilising by-product, and would mean a total abolition of the intolerable nuisance of smoke by the use of the gas for heating and the electricity for lighting. The labour of cleaning would be largely done away with, and life in cities would be altogether cleaner and brighter.

3 feet thick and just a trifle narrower than the tomb chamber. It was upheld by six rough pillars of inferior workmanship to the other masonry and evidently temporary, and had two massive tenons on each side, fitting in vertical slots or niches in the walls. These niches were carried down about  $6\frac{1}{2}$  feet below the floor of the chamber, and in them would be placed sand to support wooden posts on which the weight of the slab, about 17 tons, would come when the temporary masonry pillars were removed. Between the two niches on each side of the chamber a pit was excavated large enough to hold a man, and the two niches had openings at different elevations connecting with this pit. When it was time to lower the stone, it would only be necessary to have a man enter each pit and open these passages one after the other in order to allow the sand to escape and the timber posts to settle slowly. Such posts were found in the niches of the two tombs containing mummies. When the slab was in place the men could crawl over it, and thus leave the chamber.

**TIMBER TRUSTS IN AUSTRALIA.**

A CONDITION of unrest, says *The Brisbane Courier*, has recently prevailed in the building and timber trade generally, brought about by the action of the new timber combine in putting up prices. The increased prices of timbers have been declared to be at least to a large extent unjustifiable, the figures being in some extreme cases as much as 47 per cent. above previously existing rates, and even more. The effect of such increases, as has been pointed out to us, could not be otherwise than disastrous. The first and most natural result would be to check building operations. This would mean to hinder investment, throw workmen out of employment at a most inopportune time, interfere with the business of builders, contractors and architects, until it finally reacted upon the timber merchants and saw-mill owners themselves, by diminishing the volume of their business. The harm would not stop there, however, for its influence would extend to the timber-getters, the storekeepers in the country districts, and all those who are concerned in the carriage of the timber from the stump to the mill, including teamsters, shippers and the State railways. It could not be expected that all these people were going to sit down under the action of the Timber Trust however. Remonstrance and opposition have been prompt, and we are given to understand are sure to be effective, so

**THE SAND BOX IN EGYPT.**

RECENT discoveries in Egypt, mentioned by Mr. Ludwig Borchardt in the "Centralblatt der Bauverwaltung," show that before the Christian era the sand box was employed in the lowering of heavy columns. Three similar tombs were found near the pyramid of Onnos, all dating from about 500 B.C., and one ready for the interment of a mummy. It was a chamber about 17 feet long, 9 feet wide and 10 feet high to the crown of the arched roof of large cut stones, the first stone arch of the kind on record. The sarcophagus was in place and over it was the heavy limestone cover slab which was to be lowered when the mummy was in position. This stone was 13 feet long,

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much so that at this present moment the Trust is said to be almost inoperative, though still existing in name. The first to feel the effects of the increased prices were the builders, several of whom lost contracts through the disinclination of investors to pay the increased prices necessitated by the new timber schedule. Such a condition could not be tolerated, and an easy and effective way out of the trouble, so far as they are concerned, is found in the opportunities which exist for securing suitable timbers from outside the State. Speaking with a well-known and experienced architect on this subject, it was pointed out to us that under the new rates 100 superficial feet of Queensland pine is listed at 20s. Though in some respects Queensland pine is superior to foreign pine, there are other respects in which it is inferior, and the price of the imported article is much cheaper. In Canada, for instance, 100 superficial feet of pine can be placed on board ship for 4s. 2d. The freight on this is 2s. 6d., the duty, landed anywhere in the Australian Commonwealth, is 1s. 6d., cost of milling and dressing another 2s., a 20 per cent. profit for the merchant adds another 2s., and enables him to put it on the market at Brisbane for 12s., as against the 20s. demanded for the local article. That is an average rate, our informant stated, the imported timber being usually classified in five grades, ranging from 9s. 6d. to 17s. 6d., with good medium pine at 13s. 6d. The rates for hardwood about correspond with the foregoing. An advantage which the imported article has over the local is also found in the fact that it reaches Australia in a perfectly dry condition, whilst local timbers are rarely so unless kiln dried.

Here then was a way out of the difficulty for the builders, who consequently have taken a firm stand, backed up by prominent architects, who have declined positively to be bound by the action of the Trust. Our informant stated that it has been clearly and definitely laid down to the Trust that many of the firms interested are quite prepared to commence immediate importation of timbers from America, New Zealand, the Southern States, Russia, or any other of the numerous places where, they believe, good quality material can be obtained and landed in Brisbane at less than Trust prices. In face of this, the Trust will surely act wisely and vacate the position taken up. It is declared in certain quarters that timber has already been supplied in a number of cases at prices and under conditions similar to those which ruled prior to the new price list being issued. Pursuing our subject a little further too, it appears that in the timber trade, as in too many of our lines of business, the credit system has been and is being worked to a

demoralising extent, and the man who wants to purchase timber and has cash to pay for it can get a reduction on even the old rates.

Turning our attention to yet another leading architect of Brisbane, we received corroboration of the statement that practically the Timber Trust was broken on the matter of the increased prices, and that sales were understood to have taken place at former prices. This gentleman viewed with a deal of favour the new classification of timbers which the Trust had introduced, but the prices which had accompanied it had been a fatal objection. He had never taken a serious view of the increased prices, considering from the very outset that they could only last just so long as it would take builders and contractors to import timbers from the Southern States and other sources. If the Trust really proved obstinate and kept up the rates it could not have a very lasting effect on the building trade, all the evils would fall upon the saw-millers and merchants and those dependent upon them, such as the timber-getters for instance. As to the attitude of the architects, this gentleman said their interests were so far identical with those of the builders that they would be sure to assist in any action which the builders as a body might decide upon to face a trouble such as this. The operations of a Trust such as that under notice might have been possible before federation, but not under present conditions. Even under the old Queensland timber duties it frequently happened that Oregon and other timbers were imported for special purposes, and with this impost removed any attempt to put prices up could only have one result, and that the death of the locally-grown timber trade.

Continuing further, our representative waited on the president of the Master Builders' Association (Mr. John Stewart) with a view of obtaining from him an expression of his views regarding the effect of the operations of the Trust on the building trade of the city. Mr. Stewart first consulted a representative committee meeting. He then said that the first intimation he and other members of his association had of the formation of the Trust was contained in the following circular received at the beginning of August:—

"383 Queen Street Brisbane: July 28, 1902. Dear Sir,—As your name has been approved by the directors of the Queensland Timber Trust, Ltd., for registration in the books of the company as a contractor, I am directed to ask you to be good enough to call at this office at your earliest convenience and complete the registration. I am to urge you not to delay, as the special advantages to registered contractors can only

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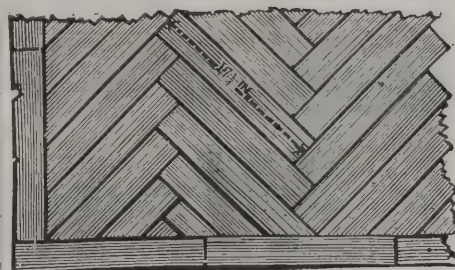
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come into operation after registration is completed.—Yours faithfully, Queensland Timber Trust, Ltd., F. D. Cleeland, Acting Secretary."

In accordance with the request made in the circular, he called at the office of the Trust to find out what the proposals meant, and from the secretary he learnt that if he signed the register it was understood that he bound himself not to purchase timber or joinery from anyone else but members of the Trust. For thus signing away his right of purchase in the open market he would be entitled to a special discount on the enhanced prices fixed by the Trust. Mr. Stewart, however, declined to accept such terms, and understanding that there were other members of the Association and of the trade who held the same opinion as himself, he at once convened a meeting of the Association and of the master builders of the city and suburbs on the matter. The result of that meeting, which was largely attended, was that those present pledged themselves to refuse to sign the Trust's register. The Trust therefore agreed to waive the necessity for signing the register, but asked the Association to pledge themselves to support the Trust in preference to outside competitors. The members, however, were not agreeable to do this, and requested that some modification be made in the new classification of the timber as adopted by the Trust. A conference had then been held between representatives of the Association and the Trust to discuss this aspect of the question, but without result. The difficulty in the whole matter, he said, so far as the builders were concerned, was this:—That the Trust had set up a certain standard for timber which the architects might refuse to agree to. In the conditions of contract, which builders have to sign, it is specifically laid down that the architect is to be the sole judge as to the quality of the materials used in the building. Consequently, if he specified first-class timber it would mean "specially selected," according to the Timber Trust's classification. Unless the architects agree to be bound by the classification adopted by the Timber Trust, they could reject any timber which the Trust might send as not being according to that specified, and thus place the builder under the necessity of procuring another quality of timber at very much increased cost. Another aspect of the question was that, although a discount was allowed, yet there had been a very material increase made in the prices. Since August 1 these increases were further accentuated by the classification and the rules regarding specially cut lengths, &c, which had been introduced into their price list. The

increase ranged from 15 to 47½ per cent on the prices paid some three months ago. Mr. Stewart said that, tersely put, it meant that the timber used by the builders as specified by the architects will in future have to come under the designation of "special class" and "special lengths." In the present state of trade and industry the members of the Association were strongly of opinion that this was a most inopportune time to introduce such largely increased prices, because it must have the effect of checking investment in the erection of buildings or repairs to buildings. The members were quite prepared to admit that the timber merchants were meeting with difficulties and expense in getting supplies owing to the drought, and were possibly entitled to receive some increase on the rates previously paid owing to this cause, but they thought that the new classification and rates made were too great, and would tend to restrict trade. Whether the Trust succeeded in maintaining their new object of classification and rates or not, the members of the Association still retained to themselves the right to purchase wherever they thought best. He (Mr. Stewart) would point out that already Southern firms were offering to supply timbers at lower rates, but their desire was not to pass over the local industry, other things being equal.

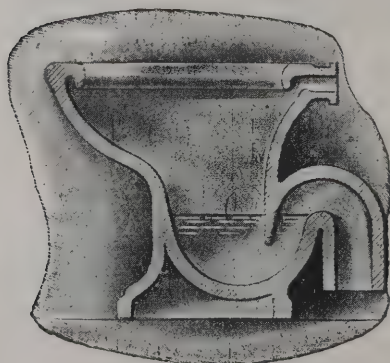
This then is the attitude of the Master Builders' Association, comprising the majority of men interested in the building trade, and by far the largest consumers of timber in this district. Pursuing inquiries of a general nature, we have been informed that an attempt has been made by the Timber Trust to obtain control of all the country mills by inducing the owners to come under an agreement with them, by which their prices will, for a certain period, be brought into line with those of the Trust. It is understood that a meeting of country mill-owners will be held on the 20th inst. to consider the matter, but how far they are likely to be influenced remains to be seen. Competition is what will break the Trust in whatever direction they move to keep up abnormal prices. Several of the builders are turning their attention to the northern rivers of New South Wales, with which communication has now been opened up, and the practicability of securing supplies from that district is asserted by many. We have before us a price list showing the rates for timber prevailing in Sydney at the present time, and it is apparent from this that it will probably be quite practicable to bring material to Queensland, pay the scheduled rates and freight, and then land it here at a considerable saving on the Trust prices.

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# The Architect.

## THE WEEK.

of the defects of the Workmen's Compensation Act is indefiniteness of what is signified by a warehouse. Among the varieties of factories are several kinds of warehouses, but from the expression "every dock, wharf, quay warehouse" it is to be assumed that not only a storehouse, but a part of a factory in which persons are employed polishing, cleaning, wrapping and packing-up goods is a warehouse. The point has given rise to much arguing in Manchester County Court. A man who was removing furniture from the premises of a house furnisher was injured by a hoist dropping on his foot and crushing it. He sought compensation on the ground that the premises were a warehouse or factory having an hydraulic lift. On the other hand, it was argued that in order to become a factory, mechanical power must be employed, and the hoist was not used as part of the process, but simply for lifting furniture in or out of the workshops. Judge PARRY thought the hoist was a mechanical power used in the process of the mechanical process. But according to the decision of Lord ALVERSTONE in *LAW v. GRAHAM*, he must come to the conclusion that the premises were not a factory. The second point was, Were the premises a warehouse? He decided that the word warehouse was intended by the Act to include big stores which traders used for storing goods for sale as opposed to small retail shops, and if he was right in that conclusion, it seemed to him that the furniture warehouse was a warehouse within the meaning of the Act. Judgment was accordingly entered for the claimant with costs.

THE pottery gathered by Mr. HENRY WILLETT has long been known to collectors. From time to time parts of it have been lent to the Brighton Museum, and were lately temporarily transferred to the Bethnal Green Museum. The whole collection has now become by gift the property of the Museum. It represents the researches of a lifetime, but it differs from most hoards of the kind in having a definite idea as a basis. Collectors, as a rule, regard only change or the style, the beauty or the oddity of a piece of pottery, but Mr. WILLETT realised that the art should be judged upon as popular sculpture. Public statues might be erected at great expense as memorials of monarchs and celebrities, but the artist in clay made his humble attempt to represent those who were admired of the people. From the reign of Queen ELIZABETH to our own days figures and paintings on pottery of the British sovereigns have been produced. By extraordinary patience Mr. WILLETT has been able to secure examples. Military and naval heroes are also to be seen. The figures cannot be taken as successful portraiture or as records of costume, but even when they suggest the ignorance of the artists, as well as of their noble patrons, the pieces are not without value. A collection of the kind is well adapted for a museum to which excursionists can have recourse. Students who are familiar with the works of the great French and Italian painters and of the painters and sculptors who co-operated with them should observe the British works with attention, for they are evidence of incipient art.

THE roads and bridges committee of the Oxfordshire County Council had recommended the adoption of tenders for rebuilding the Three Bridges at Sonning according to the plans of Mr. TOLLIT. The total amount was 7,671*l*. The committee in the report said they had given consideration to the adverse criticism of the design. They had, however, decided to adhere to the plans for an iron bridge because it was undeniable that the present bridges are unsafe and incapable of repair or restoration, and that a bridge of brick arches or of wooden construction would be wholly impracticable owing (a) to the flatness of the road-way and (b) to the fact that in the winter floods the water is to the level of the wooden bearers and submerges the lower portion of the present bridges. It was also imperative that the bridges must be of permanent strength and struc-

ture, capable of bearing the heaviest modern traffic, and also must provide for sufficient waterway to satisfy the controlling power of the Thames Conservancy. An alternative design was also prepared, in which brick piers were used and the old railings were substituted for the lattice parapet. Lord JERSEY, as a member, said he preferred the alternative plan, but he should like to have seen further modifications. Mr. BRASSEY, M.P., also approved of the alternative design as it was more ornamental; the extra cost would not exceed 1,000*l*., which would be spread over a considerable time, and it was preferable to expend the money than to erect a permanent eyesore. Finally, it was determined that the two plans should be again referred to the roads and bridges committee, and that power be given to adopt either provided the expenditure did not go beyond 9,000*l*.

THE great orator BOSSUET was a native of Dijon, but although two and three-quarter centuries have passed since he was born his native city is without any memorial of him. It is, moreover, doubtful whether one will be erected. There is a committee charged with the undertaking, and a sum of over 1,000*l*. has been collected; but although solicitations for subscriptions have been circulated broadcast there has been little response. There seems to be a fatality following the memory of the great preacher. At the time of his death he was out of favour with the Court. The bishop desired to be buried in the cathedral of Meaux, but the ceremonies were deprived of much of their majesty. His ecclesiastical vestments were dispersed as if they had gained no value from his wearing them. The bishop was in debt, and he was too poor apparently to leave the usual alms for the poor or souvenirs for his friends. His statue in the cathedral was not erected until 1820. Happily BOSSUET stands in no need of a memorial. His discourse on "Universal History," which awakened the ambition in BONAPARTE to become the ruler of the world, and his "Funeral Orations" are monuments which must endure as long as the French language.

ACCORDING to the new rules of the Board of Education relating to elementary schools, no loan of money can be obtained from the Public Works Loan Commissioners unless the whole cost of the school, exclusive of site, legal expenses, extra rooms for instruction authorised by the Code, and residences (if any), is kept within the sum of 10*l*. per child accommodated. Some additional allowances will be made on the following scale per square foot:—For a central hall or corridor, 15*s*.; cookery or laundry room, 20*s*.; manual instruction room, 10*s*. to 15*s*.; science room, laboratory, or drawing-class room, 20*s*.; teacher's room, 15*s*. From 500*l*. to 750*l*. will be allowed for a teacher's house, and not more than 400*l*. for a caretaker's house. For glazed bricks and fireproof floors (when necessary) allowance will be made according to the circumstances of the case. Allowance for mechanical ventilation will only be made in districts where the air ought to be filtered before entering the building. No additional allowance will be made in respect of any room which exceeds the maximum size specified in the rules, in so far as regards such excess. Whether the necessary loan be borrowed in the open market or not, extravagant plans cannot be approved.

NOT only in Scotland, but in other parts of the Empire the announcement of Dr. R. ROWAND ANDERSON'S knighthood must have caused gratification. He has gained a reputation as a master for his refined work in Edinburgh and elsewhere in the North, and he was one of the earliest in our time who sought the aid of painters, sculptors and mosaicists in adorning buildings. It must also be remembered to his credit that when some slight was offered to architecture by the Royal Scottish Academy he did not hesitate to resign his membership, and stood aloof from that body during several years. He has been consulted on many difficult cases by the Government, municipalities and ecclesiastical bodies. The new knight has honourably earned his distinction, and his friends will heartily desire that he may long enjoy it.





PAINTERS' ARCHITECTURE: GASPARD POUSSIN.

### THE ARCHITECTURAL MUSEUM.

THE foundation of the Architectural Museum was one of the results of the Great Exhibition of 1851. Among the numerous varieties of English work which were seen in Hyde Park, the objects in the Mediæval Court were judged to be in many respects the most remarkable of all. Although people had heard about Gothic church furniture, the majority of visitors to the Exhibition had not realised to what perfection works in metal and other materials had arrived by the adoption of the style. The contents of the court were accepted as genuine handwork, and the conclusion was drawn that men who were capable of producing so many things which were excellent would, if fine examples were placed before them, be enabled to reach a still higher standard of perfection.

There was accordingly an endeavour to obtain a great variety of masterpieces which might be imitated. Marlborough House was turned into a show-place of ornamental manufactures. The shield ascribed to BENVENUTO CELLINI was lent with other treasures from Windsor Castle. The Sydenham palace consisted principally of courts which as far as possible were direct reproductions of architectural works. But much else was required, and a museum of casts was therefore organised in Cannon Row, Westminster. The premises would now be condemned as ill-adapted for the purposes of exhibition. The building was one of those of which few survivals exist along the river-side, mainly constructed of timber, and at high-water could be approached from the Thames. Most of the promoters of the project were enthusiasts for Gothic—BERESFORD HOPE, JOHN RUSKIN, GILBERT SCOTT, RAPHAEL BRANDON, J. K. COLLING were among those who were associated with the venture. But DIGBY WYATT, Professor COCKERELL, Earl DE GREY, the President of the Institute of Architects, were no less disposed to be helpful. Prizes were offered to workmen by JOHN RUSKIN, BERESFORD HOPE and others. RUSKIN, it is needless to say, imposed conditions which were original. His prize was to be for workmanly invention and skill, not for architectural knowledge or botanical research. Any architecture approved by him was to be pure brick square-windowed cottages, and in no way Greek or Grecised. If in any ornamentation horses were to be introduced, they were not to be prancing like those in the Panathenaic frieze, and their pace was not to exceed a trot. Such stipulations were enough to suggest that the museum was to be used for the realisation of crotchets, but at the time there was so much enthusiasm about the new era in art that the museum was able to prosper. In the course of some years the collections became so extensive that larger premises had to be erected in Tufon Street. A school of art was afterwards connected with the museum, and the two form undoubtedly a valuable property.

The decline of Gothic in public favour was not advantageous for a museum which was formed chiefly of casts of architectural detail and sculpture from Mediæval buildings.

The original founders passed away, and the old support grew less generous. Thirty years ago it was proposed to pose of buildings and casts. We are quite sure the museum would have long ago collapsed if Mr. MAURICE B. ADAMS had not steadfastly held the office of honorary secretary during a quarter of a century, and stood "four square against all winds that blew." If at the present moment the museum is, as he says, perfectly solvent and able to discharge all its liabilities, it was through his resolution to face difficulties which would have daunted many other men.

It was not to be expected, however, that Mr. M. ADAMS should be content to be always acting as a buttress to the museum. In the course of last summer he suggested to the president, Sir WILLIAM EMERSON, that the project should be assigned as a free gift to the Architectural Association on the condition that the title should be retained, and that the public should have the free use of the museum. The Ecclesiastical Commissioners expressed their willingness to transfer the leases to the Association. The premises were also examined by Mr. H. T. HARE and Mr. W. H. SETH-SMITH on the part of the Association, and they expressed a desire to take them over. Finally, it was decided that a special committee representing the museum and school of art should be appointed to investigate the whole business connected with the proposed transfer and to prepare a report and financial statement.

The report sets forth that for a long while the unique collection of casts has not fulfilled more than partially the purposes for which it was originally intended. But the expenses were not diminished. During the past few years new studios have been erected at a cost of over 3,000*l.*, and the original buildings have been repaired and reroofed at a cost of 700*l.* Although the Westminster School of Art has been successful, the collection in the museum afforded little special assistance to the students, as the studies were primarily directed to the drawing from the life and kindred subjects. The special committee, consisting of Mr. SYDNEY W. LEE, Mr. W. PAIN and Mr. MAURICE B. ADAMS, proposed the following terms for acceptance by the Association:—

The Architectural Association to pay to the Council of the museum any sum which may be found necessary to relieve said Council from all liabilities after the Council shall have expended all their available funds in carrying the transfer of the Association into effect. This liability is roughly estimated at 700*l.*, including the winding-up of the Museum Association and the assignment of the leases.

To retain the services of Mr. Francis Ford, the curator, at least twelve months from March 25, 1903, at his present salary; and afterwards, should they not require his services, to pay him 2*l.* 2*s.* per week for the remainder of his life.

To pay to Mr. Holgate, assistant master since the year 1884, upon completion of the transfer of the museum, a salary of 50*l.*

To undertake, with the consent of the King, that the name of the Royal Architectural Museum shall in some way be retained.

To undertake to keep the museum open to the public, as has been the case hitherto.



The transfer to take effect on March 25 next, and to include all the fixtures, fittings, and furniture then on the premises, and being the property of the Council of the seum.

The conditions have been unanimously and heartily accepted by the committee of the Architectural Association, and are sure to be approved by the special general meeting which will be held on the 24th inst.

It is estimated that the money value of the casts and objects of art in the museum, exclusive of the historic furniture and fittings, and furniture in use in the buildings between twenty and twenty-five thousand pounds. Mr. WILLIAM PAIN estimates the value of the unexpired terms of the two leases, subject to the ground rent, at 6,500*l*.

By the arrangement the Architectural Museum does not cease to exist, but enters on a new phase of existence which may be regarded as corresponding exactly with the intentions of the founders and early supporters. If an inquiry could be made it would be discovered that hitherto more has been made of the casts by architects' assistants and pupils than by art workmen. By connecting the museum with the Association it will be incumbent on the members to employ the collections in their studies, for otherwise the contents of the museum would then resemble the proverbial white elephant. There is also the advantage that the Association can obtain a site for headquarters which is well adapted for the purpose. It was more by accident than deliberate choice that the neighbourhood of Regent Street was selected by the three architectural societies of the metropolis. Westminster is not remote from the heart of London, and it should also be remembered that of late a colony of young architects has settled in it, and the district is likely to become a rival of Bloomsbury. Both the Council of the museum and the Architectural Association are indebted to Mr. M. B. ADAMS for the part he has taken in negotiations which have ended so successfully.

### THE CONDITION OF FACTORIES.

It is unusual to have scientific investigations undertaken by the members of a committee, and for that reason an important report on the ventilation of factories and workshops may not receive the attention it merits. The committee, however, consisted of only two members and a secretary. The late Home Secretary, Sir M. W. RIDLEY, on July 13, 1900, appointed Dr. JOHN SCOTT HALDANE, F.R.S., and Mr. E. H. OSBORN, engineering adviser to the chief inspector of factories, to be a committee to inquire into and report upon (a) the means of ventilation in factories and workshops, with especial reference to the use of fans; (b) the use and construction of respirators for the protection of workpeople exposed to dust or dangerous gases. In two years they were able to prepare their first report. It is divided into three parts. One is the report and recommendations; another is an account of the conditions demanded for efficient ventilation, which is, in effect, almost a treatise on the subject, and the third is a description of the process employed for the determination of carbonic acid in the air of factories and workshops. Carbonic acid,  $\text{CO}_2$ , is the enemy the two specialists were engaged in pursuing, and it has been sought in factories or workshops for clothing, tailoring, dressmaking, bootmaking, dries, cabinet and upholstery works, bakeries, printing and bookbinding works, stationery, engineering and metal works, file cutting, textile fabrics and miscellaneous factories. No less than 600 factories and rooms have been visited, and the results of the investigations tabulated in the most exact form.

In such an inquiry it is essential to have some standard. TENKOFER was of opinion that 10 volumes of carbonic acid per 10,000 volumes of air should be the limit. CHAUMONT, whose calculations were based on the air in barracks, proposed as low a limit as 6 volumes per 10,000. A report prepared in 1887 by CARNELLEY, ANDERSON and HALDANE recommended that for crowded elementary schools a lower limit than 13 volumes could not be adopted. The authors of the report before us have come to the conclusion that under ordinary circumstances 10 volumes of carbonic acid per 10,000 volumes of air should not be exceeded in factories or workshops unless gas is burning.

In weaving sheds, where the air is artificially humidified, a limit of 9 volumes has been established by law. It is only enforced during daylight, and is considered to be rather stringent except in cases where much gas is burnt during morning or evening in winter.

It is hardly necessary to say to any one who has visited workshops that such a standard is at present very often disregarded. In a wholesale tailoring workshop in White-chapel, which was "lofty and spacious," there were 36 volumes. In "a particularly nice-looking, clean, light and well-kept room, open to country on all sides," and used as a stay factory in Gloucestershire, the inquirers found 18.9 volumes, the air outside having 3.5. In a light, clean, spacious room, heated by steam pipes and comfortably warm, and used as a wholesale collar factory, there were 38.6 volumes. In an English tailor's workshop at Cheltenham the volumes rose to 53.2. In a furrier's workshop the acid was 21; in a West-end dressmaker's it was 26.6; in a boot workshop it was 34. In a spacious workroom occupied by upholsterers 20.7 volumes were observed. In art metal works 16.4 was registered. In an engineering gauge shop it was 24.4. File-cutting is undeniably an unhealthy industry, but only in one case was 21.2 registered, and several were under 10 volumes.

In the majority of places the excess of carbonic acid is presumably owing to the neglect to provide adequate ventilation. It must, however, be acknowledged that where means of ventilation existed they were often rendered useless by neglect or the closing of them by the workpeople. Thus, in one instance, the committee report that "the high results are difficult to account for, but probably the ventilators had all been closed to within a few minutes of a test being made, as women were seen to hurriedly open them." In other cases the windows were shut, and even slight crevices were covered with paper. A printing office is described as having "twenty side windows, all closed and every chink stopped up. One roof ventilator slightly open out of six." The use of ventilators was demonstrated. An electric fitting-shop which was greatly overcrowded would, it is said, undoubtedly have been very bad but for the large amount of ventilation. Not more than 8.2 volumes were registered in it. A weaving-shed at Bolton is described as one of the most modern and perfect of its kind—clean, light and lofty, with newly-whitened walls and ceiling, and spotless stone floor. But the carbonic acid was 14.3, which was explained by the circumstance that although there were eighteen ventilators in the roof, each of 12-inch bore, all were closed. Another room belonging to the same firm, which is commended as the finest of the series, being newly painted and varnished, disclosed that the air was chemically impure, there being 16.8 volumes of carbonic acid. There were two extracting fans and both were stopped. They were set in motion and the carbonic acid fell to 10.8. The most remarkable proof of what ventilation can perform was presented in a cotton mill at Leigh in Lancashire, where the volume of carbonic acid was 2.8, which was precisely the same as the outside air.

In addition to the factories a large public hall in the provinces was selected for experiment on a day in November 1901. It was then in use as a flower show, and four or five thousand people attended. The windows were closed, no mechanical ventilation could be seen, felt or heard, but there was a large circular air grid in the roof. On the ground floor in front of the orchestra 20 volumes of carbonic acid were registered. An hour and three-quarters afterwards, when the crowd was beginning to thin, as people were leaving to catch trains, and some draughts of cool air were able to enter, the volumes fell to 14.2. Under the President's gallery at the opposite end to the orchestra the register was 19.6, and at the same spot a little later 18.2. In the first floor gallery there were 30.4 volumes, which rose to 44.4; in the second floor gallery it was 39.4, and in the orchestral gallery surrounding the organ 38.6 was registered, although under one of the circular grids. The experiment confirms the general experience about the upper part of a theatre or place of assembly being the most oppressive. Although the spectators were departing, the effect was not immediate, and it is evident that on such occasions—and the same may be said of the smallest room that has been occupied—if it is only by the



temporary absence of living beings and the employment of effective ventilation that any space enclosed by walls and a roof can be restored to a normal state corresponding with that of the outside air. While in the hall in question, with its 44.4 volumes of carbonic acid the air was suffocating and oppressive, the outside air contained 3.3 volumes, and it can hardly be doubted that such sudden changes as arise in an exit under those conditions cannot be endured by delicate people without danger to themselves.

A glance at the figures in the tables must convince the most incredulous that the condition of the interior of factories can be transformed if sufficient care is given to ventilation. It is not enough, however, to expend money on apparatus. To the humbler classes ventilation means draughts, which are often followed by colds and other forms of illness, and which may end in death. Consequently, the resident caretakers in blocks of chambers and flats, as well as male and female workers throughout the country, do all in their power to make the arrangements for ventilation useless. It is recommended by the committee:—"That inspectors of factories should inform employers of the results of any official analyses of the air in their factories or workshops, should give notice that the ventilation is deficient to any employer in whose factory or workshop the proportions have been found to be exceeded, and at the same time supply, so far as practicable, information as to the nature of any defect noticed; and that legal proceedings should not be taken against an employer unless, after a reasonable interval following such notice, the stated proportion is found, on an average of two or more samples taken in different parts of the room, to be again exceeded by one volume or more, and he is unable to show that he has taken measures reasonably calculated to secure the requisite ventilation."

It is no less essential that employers should exercise control over their workpeople. For if ventilators can be closed and fans stopped with impunity it is evident that ventilation will be no more than a delusion.

It cannot be complained that the standard of 10 volumes is excessive. The maximum of carbonic acid in the centre of London was found to be 4.8 volumes from April to September, and 6.4 volumes from October to March. The minimum was 3.0. The average for London is therefore about 4 volumes. In country towns the ratio is less. There is little difficulty in devising arrangements by which the air of factories will not exceed the 10 volume proportion, unless under extraordinary circumstances. Much else can be done besides making provision for determinate ventilation. Gas-jets may not only be wasteful but also vitiate the air. In employing gas as a motor power there is also a possibility of the combustion being imperfect, and in that way a share is contributed to the impurities. Employers (and the duty is no less incumbent on those who have undertaken the responsibility of letting rooms to tenants) should look on ventilation as an element in a system of government of which they are the head. If they cannot fulfil the duty of supervision it should be deputed to some trustworthy person.

The inquiry into the proportion of carbonic acid is only one part of what has to be done in order that factories may not be injurious to those employed in them. Very little information is forthcoming on the important subject of bacteria. The question of overcrowding must also receive attention. The minimum air-space is assumed to be 250 cubic feet per person. But in one place we find only 193 feet, in another 117 feet, and if the obstructions were taken into account the cubic space would be less than 100 feet. It is likewise unpleasant to learn that many workshops are not more than 8 feet high, although several workpeople may be employed in them. Thus in one West-end dressmaker's thirty-two people were engaged in a room 8 feet 6 inches high, and twenty-eight in one that was 7 feet 10 inches. The subjects of drainage and substantial construction are outside the province of the committee. But enough has been revealed to make the necessity evident for a vigorous application of the Factory Acts.

**Mr. W. J. Jennings**, of Canterbury, has been appointed surveyor to the diocese of Canterbury at a meeting of the archdeacons and rural deans held at Lambeth under the presidency of the Archbishop.

## FIRE PREVENTION TESTS.\*

IN more simple times three removals were supposed to be as bad as a fire. When a family occupied a house during successive generations it was reasonable to be afraid of departing from an old home, whilst a fire was taken to be the cause of irretrievable ruin. The progress of civilisation has brought more or less indifference to both. The inconvenience of removal has been reduced to such a minimum, people now consider the advantages of change outweigh the expense, and in consequence periods of tenancy are becoming shorter in duration. The study of the laws of probability has created systems of insurance which can be applied to all varieties of risk. Individuals used in cases of fire to contemplate their particular losses, which no doubt were of a kind to alarm them. Now they realise their position as units in an immense mass, and have the gratification of knowing that their losses will fall on other people, some of whom may be enemies to whom it is gratifying to mulct. A man of business is expected to have exercised foresight to such an extent as to be able to inform all who have dealings with him that on the day after a conflagration he is prepared to continue his operations in another place. There is to be not the least inconvenience to his customers except having to think of the new address in their communications. This is widely different from the time when a fire was believed to be a punishment like plague or the sword. The system of insurance has now reached such perfection that great property owners insist on their tenants taking out policies in particular offices, for in that way the landowner's interest in all the leaseholds is safeguarded without the trouble of sending a postcard to inquire whether the rebuilding or restoration of injured premises is well commenced. However remote may be any future time, it has a value in the eyes of an actuary which can be made subject of calculation, and hence the falling-in of leases: the consequence of fire is a contingency which is not to be despised.

In discussing fire problems it is well to bear in mind their scientific and economical aspects. On reading occasional accounts in newspapers it might be inferred that not only the immediate sufferers, but the inhabitants of the district around the ruins were bewailing a catastrophe. All that is merely a rhetorical tribute to imaginary people. It is rare to hear any pity expressed by the spectators of fire, and the owners of the property must have been negligent of their own interests if they cannot look on the flames which consume it with philosophic composure. The downfall of a building gives an opportunity for the erection of another more suitable to its use, but when the new plan is being suggested it may be assumed that all features which are supposed to confer more safety against fire will be scrutinised with dislike.

It is not through the operation of ignorance that buildings are erected which quickly succumb whenever there is an outbreak of fire. Few clients give their architects *carte blanche* in providing against that form of destruction. They say they pay heavily for insurance, and the reduction of the annual rates on account of improvements is not proportion to the increased outlay. Owners of buildings are likewise sceptical about the power of resistance offered by many devices in the hour of trial. Many other reasons are brought forward to excuse the general indifference to inventions which would diminish the risks of the destructiveness which accompanies fire.

To overcome so much lethargy among the British public is no light task. From time to time there have been efforts to convince owners of property and leaseholders of the necessity of adopting other means of security than ordinary building materials. Pamphlets have been issued and lectures delivered with that object, but the effect produced by so much labour has been almost insignificant. **BRADWOOD'S** death several years ago was a confirmation of what he had said about the danger which was inherent in the ordinary London warehouse. For a short time there was less confidence in the all-sufficiency of the modern system, but it was only a transient movement of sympathy, and a revolution in building followed.

\* *Reports of Fire Tests by Fire Prevention Committee.* With illustrations. Edited by E. O. Sachs. 2 volumes. London: B. Batsford.



Much credit is therefore to be given to the British Fire Prevention Committee for their persistent efforts to demonstrate how far invention can cope with the power of fire. During five years many inventions have been tested by the committee. The work has fallen on "a small executive body of twelve architects, surveyors and engineers," and it cannot be said they have always been encouraged by those who should have realised the obstacles which had to be surmounted. According to Mr. SACHS, the chairman, "the work has been carried out under considerable difficulties, meeting at first with the prejudice of many of our public building officials, who should have known better, and even to-day being ridiculed as unnecessary by the more un-intelligent or unenlightened of the Fire Brigade officers, whose operations would, as a matter of fact, be greatly facilitated if the principles put forward by the committee were generally observed." Officials and fire brigade officers are, however, only acting in the spirit of the mass of property owners. So long as safety is looked upon as a mere debit and credit affair between policy-holders and insurance companies, as it is at present, we cannot expect to see a general effort to make buildings enduring. Indeed, some people go so far as to believe that the introduction of improvements will prejudice their interests should it be necessary to make claims against insurance companies.

Experts will differ in opinion about the possibility of representing on a small scale all the peculiarities of a fire in a building. The destruction caused by heat is often exceeded by the impact of falling bodies, including, it may be, the building materials of the upper storeys. Construction in metal that seems likely to resist for a comparatively long period often instantly succumbs to the cold water of the firemen. There are few fires which do not offer surprises to firemen, however experienced. While so much must be granted, there is no doubt that the behaviour of materials and manufactured articles when attacked by flames can be anticipated by experiments, especially when they are of the character of those of the Fire Prevention Committee. The temperatures are as far as possible recorded by a special pyrometer, visual effects are photographed, deflections are measured by level and staff or by weights and pulleys. According to Mr. SACHS, "The guiding principle of the committee's investigations is the desire to record facts only, without criticism, and, as will be seen from the reports presented herewith, every effort has been made to keep even the wording as colourless as possible." It is no exaggeration to say that as many facts relating to burning as are found in the two volumes are not to be met with in all the reports and papers which are to be consulted in professional or technical libraries.

Over sixty tests are described in the two volumes. They relate to floors, ceilings, partitions, doors, glazing, &c. Some are patented arrangements, but among the 23 doors "there is not one in which either make, material, or fitting is subject to any form of trade-mark, registration, patent, or the like."

Many of the tests should give confidence to those who use fireproof flooring. In one case, where steel joists, concrete and corrugated iron were combined with a suspended ceiling, the temperature was increased to 2,000 degs. Fahr., and then suddenly cold water was applied for three minutes, the load being 168 lbs. per square foot. The ceiling fell, the floor deflected  $2\frac{3}{4}$  inches at centre and afterwards returned to within an inch of level, the concrete was slightly disintegrated on the underside, but "the fire did not pass through the floor." With a floor of wood joists filled in with concrete, the joists were ignited, but the floor stood a test of 2,500 degs. Fahr. followed by application of cold water, although weakened and deflected. It collapsed five hours after test.

The tests on doors will suggest the limitations of timber. A deal ledged door was destroyed in 25 minutes under a fire of 2,000 degs. Fahr. A pine door collapsed in 26 minutes, the temperature being 1,600 degs. Fahr. A solid framed 2-inch teak door, after 24 minutes, showed signs of flame, but resisted to some extent for about an hour. The relative merits of oak and teak are difficult to assess, for after over an hour's test, door frames remained in position, but charred on the inside to the depth of  $1\frac{1}{4}$  inch. The remains of the upper panels of the oak door "showed a small area of uncharred surface on the side

away from the fire. There were few remains of the teak door." An American walnut door collapsed in 58 minutes, while an oak door came to an end in 55 minutes. Mahogany endured for 49 minutes, while a companion in poplar fell in 36 minutes.

Professors of construction in colleges should utilise the volumes for exercises in their classes. It would be a serviceable task to epitomise the results of the experiments. The resisting power of materials has not been adequately studied hitherto, and it is no wonder, for tests are costly and difficult. The two volumes have been produced in an excellent, nay, in an attractive style. In course of time we hope to see others issued by the Fire Prevention Committee, for hitherto the subject has been treated as if it were outside practical testing.

#### EGYPT EXPLORATION FUND.

THE annual meeting of the Egypt Exploration Fund was held on the 8th inst. Sir John Evans presided.

The Treasurer's report for 1901-2 stated that the Fund and its branches, the Archaeological Survey and the Græco-Roman branch, were financially in a sound condition. As regarded the Exploration Fund, the total expenditure had been 3,378*l.* 14*s.* 4*d.*, as against 2,351*l.* 1*s.* 8*d.* for last year. The expenditure expenses amounted in all to 1,406*l.* 7*s.* 5*d.*, of which sum 1,270*l.* 16*s.* 1*d.* was directly or indirectly for Professor Petrie's expedition to Abydos. The remaining 135*l.* 11*s.* 4*d.* was incurred by M. Naville, who visited Deir-el-Bahri to finish up the opening of the temple and to complete the remaining volumes of his publications. By publications 1,608*l.* 5*s.* 2*d.* was spent, the largest amount ever incurred, and three times as much as last year. The total receipts had been 3,048*l.* 0*s.* 1*d.*, viz by subscriptions from English subscribers 1,330*l.* 6*s.* 9*d.*, including a special donation of 100*l.* from Mr. John Edward Ellis, M.P.; from the Boston office in America, 851*l.* 0*s.* 4*d.*; and from the affiliated branches of the Fund in the United States—Chicago 255*l.* 8*s.* 6*d.* and Philadelphia 150*l.*—making a total of 2,586*l.* 15*s.* 7*d.* The disbursements of the Archaeological Survey had been 783*l.* 12*s.* 3*d.*, about 260*l.* more than last year. In the Græco-Roman branch there was a total disbursement of 647*l.* 15*s.* 8*d.*, the receipts being 681*l.* 16*s.* 2*d.* The general balance-sheet showed that the assets of the Fund and its branches amounted on July 31 to 5,196*l.* 1*s.*—viz. of the Exploration Fund, 3,287*l.* 13*s.* 6*d.*; of the Archaeological Survey, 666*l.* 4*s.* 9*d.*; of the Græco-Roman branch, 1,192*l.* 2*s.* 9*d.*; and of the Survey Students' Fund, 50*l.*

Sir John Evans delivered an address in which he first paid a tribute to the labours of Mrs. F. Llewellyn Griffith, who aided in the foundation of the Edwards Library and Museum, as well as of the professorship of Egyptology in University College, London. The excavations carried on for the Fund by Professor Flinders Petrie were mainly among the royal tombs, and partly within the Temenos of Osiris at Abydos. One of the results of last year's work had been to add another name to the list of kings before the first dynasty. For the present the list stands:—Ka, Ro, Zezer, Nar-Mer and Sma. Of the antiquities found, the British Museum, the Ashmolean Museum at Oxford, the museums at Boston, New York and Chicago had been the chief recipients. The account of the work of Mr. MacIver and Mr. Mace entitled "El Amrah and Abydos" would soon be issued as a special extra publication. The archaeological report would also shortly appear. For the Archaeological Survey, Mr. Davies had again carried on a campaign single-handed in Upper Egypt and Tell-el-Amarna was the site chosen. A short visit was paid at the beginning of the season to Thebes. A magnate of that capital, Aba, in the time of the twenty-sixth dynasty, reproduced for his own tomb many scenes from that of his namesake Aba at Deir-el-Gebrâwi. All that remained of them were traced by Mr. Davies. The publications of the Survey had been increased by the first volume of Deir-el-Gebrâwi, devoted to the tomb of Aba and the small tombs of the southern group. The publications of the Græco-Roman branch were somewhat in arrear, but the large volume of Tebtunis papyri, which had just been placed in the hands of subscribers, was a double volume. They were indebted to the University of California, which provided the funds for the excavation, for the necessary number of volumes to supply the subscribers. The papyri, almost without exception, were obtained from the wrappings of mummified crocodiles at Umm el Baragât. These were edited by Mr. Grenfell and Mr. Hunt, assisted by Mr. J. Gilbert Smyly. The classical fragments were only four in number, three being fragments of anthologies or epigrams, and the fourth an extract from the second book of Homer's "Iliad," consisting of about eighty lines. Strange, too, as it might sound, there were dining clubs in those days, of the accounts of which portions were forthcoming. The members at each dinner were usually about twenty in number, and each paid 100 drachmæ, exclusive of wine, bread and gar-



lands. The names of the guests, generally about four, were given on a separate list. The cholera which during the summer ravaged Egypt was now rapidly diminishing in virulence, and Professor Flinders Petrie and Messrs. Grenfell and Hunt felt justified in returning almost at once. The programme of the Archaeological Survey for the coming season was to combine work at Tell-el-Amarna with visits to one or more of the small sites on the east bank of the river, where the copyist was much needed. The researches of the Græco-Roman branch would in the main be conducted at Hibeh. Messrs. Grenfell and Hunt had been hard at work on the Oxyrhynchus papyri, vol. iii., and it was hoped that it would be ready for publication about July next. It would be found to contain some remarkable fragments, including portions of two odes by Pindar, and a considerable fragment of the "Kolax" of Menander. Two mimos were also there, and a fragment from the "Cesti" of Julius Africanus. There were also fragments of the "Gorgias" and of the "Iliad." Among the theological fragments was one of the Apocalypse of Baruch, which was now, for the first time, extant in the Greek original, though previously known by a Syriac translation. With regard to some of the more important museums of Egyptian antiquities, that in Egypt itself had for some time been in process of removal from Ghizeh to the new museum at Cairo. The collection in the Louvre had been rearranged and its contents rendered more available for study. This has, to a great extent, been accomplished by the aid of Professor Pellegrini. The revision and rearrangement of the Egyptian gallery of the British Museum had been actively carried on by the industrious keeper of the department, Dr. Budge. Another matter to which he must refer was the Boston committee, in which there had been some friction. A new committee had been formed, which was exceptionally strong and consisted of seven members, the Emeritus professor of Greek literature at Harvard, Dr. Goodwin, being the chairman.

Professor Petrie said:—I need hardly trouble you with any details of the work of last year, as the volume "Abydos I." has been in your hands since July. The Fund has always issued its results more quickly than those of any other work, and for the last three years the publications have been given to you as soon as the collections reach England. The work of building up the early history of the dynasties has continuously gone forward, and few perhaps realise that what is now quoted as a matter of course in the order of the kings was entirely brought to light only two years ago in royal tombs. When that was published the envious remarked that we should doubtless have to change our minds because the results were so quickly laid down. But scarcely a single conclusion has been modified in the two succeeding years which have built up so much more. And the only argumentative objections that have been raised entirely fall to the ground when accurately studied.

The main result of last winter's work was the reading page by page the successive levels of the early town of Abydos; identifying the earlier levels of it with the last four stages of the prehistoric sequence dates, and the later levels with the reigns of the earliest kings. Thus an exact continuity has been determined between the end of the prehistoric age of unwritten record and the beginning of the 7,000 years of written record of Egyptian history. This is entirely the result of archæology; not a word or a sign of writing helped this discovery; and a scholar who only understood the written record would have seen nothing in the site but a meaningless cartload of flints and broken potsherds, as meaningless to him as a papyrus roll is to an Arab digger. Our knowledge of the past has gone through four stages—the gold-hunting, the art-hunting, the inscription-hunting and now the archæology-hunting. Each stage has been despised as foolishness by those who preceded it, and each in its turn has shown that there is a wider interest and a greater importance in the remains of past civilisations. In the coming year we look forward to a very definite course of work. There is the great site of the oldest temple of Abydos, on which we have only yet cleared down to the eighteenth dynasty level. The two or three yards of accumulations which lie below that must consist of the older remains of the temples which were rebuilt by the earlier kings. Reused blocks of the sixth, eleventh and twelfth dynasties show that a series of temples have left their mark, and the temple of the first dynasty kings is the goal which we seek below all these. The site is under water-level till late in the spring, and it will be needful to do the costly work of removing all the upper layers in order to dry the soil below and to be able to work, perhaps under the water, to finish it. But the most important early site in Egypt is worth some trouble and cost, to save all we can of history which will never be known except from this ground. Another great work is that of clearing out the two immense tombs of the twelfth dynasty kings, which were found last year. One of these I have gone through, and seen two vast sarcophagi of red granite and hundreds of square yards of polished quartzite lining the passages, which show the lavish care of the work. We may hope to bring some fine objects to light from the deep mass of chips and rubbish which half fills the passages

and chambers, some 600 feet long. There is also the excavation of the large fort of the Old Kingdom, within which burials of later ages have been found, but as it has never been really cleared out there is much to be done in it. And besides this, the great cemetery of Abydos has been by no means exhausted yet. Now all this work is a very large amount to cover, far beyond the scope of one person. The ideal of the Fund has hitherto been that of individual explorers, sometimes with assistance, examining a single building. This has perforce had extensions, but the unit of work has been the type. I hope that this year will see a different ideal established, that of a group of workers, each devoted to a separate ground, and all co-ordinated in methods and results by one organiser. The committee have agreed to the principle of extending the work by joining more workers together, and we go out this year a much larger party of united workers than we have ever had before. To my great regret we have lost the help of the most capable student we have had, Mr. Arthur Weigall, who has been offered a position in Egypt in which he will find future scope. We start, therefore, with entirely new helpers. Mr. Hugh Stannus has offered for this year his skill in architecture and drawing, which will help to clear the history of the Osiris temple. Mr. Currelly, Mr. Rawnsley and Mr. Ayrton are all new to the subject, and with different capacities and in various ways will, I hope, take charge of parts of the works. Miss Hansard has volunteered to stay and give us some help with artistic drawing, and Miss Eckenstein will attend to the camp work on the collections. My own business will be organising, arranging and interpreting the work, drawing and preparing for publication. On collateral work, apart from the Fund, Miss Murray and my wife will be copying a great inscribed tomb. Thus we shall be a party of nine, and hope to get through in one season what on the old rate would have taken three years. There can be no question that this is far the more economical way of working; and it is obvious that the more we can show done the better encouragement there is to subscribers at home and abroad. We start, therefore, on what will, I hope, be a new type of working for the future, and shall have a staff which will render the Fund less dependent than before on the health of any one worker. It is the duty of this Society to rescue what we can in Egypt before it is entirely wrecked by the dealer, the ignorant amateur and speculator and the commercial destroyer, none of whom leave a shred of information; and a duty which has its scope in the present generation particularly, as at the rate of wreckage there will be but little left behind for future lives to explore. Now is the time.

#### THE SURVEYORS' INSTITUTION.

THE first ordinary general meeting of the session 1902-3 was held on the 10th inst. at the Institution, Great George Street, Westminster, and there was a large attendance of members. The president, Mr. Arthur Vernon, in his opening address, congratulated the members on the flourishing state of the Institution. There were now on their roll a total of 3,424 members, drawn from almost every part of England, Scotland, Wales and Ireland, and including 20 colonial Fellows. Of this total no fewer than 1,433, omitting students and ordinary Associates, had qualified by examination. The Council had been able to accumulate invested funds to the extent of 10,000*l.*; the Institution was free of debt, and they were in receipt of an income equal to the annual outlay. Those who founded the Institution in 1868, the President said, were animated by an unselfish desire to raise the standard of the profession alike in the interests of surveyors and the public. There were at least four things absolutely necessary to every thoroughly qualified surveyor—knowledge of his art and the basis of the law, science and practice of his profession; the study of the application of such knowledge to practical work; the cultivation of a sound judgment combined with tact and good manners in dealing with the problems that came before him, and the strictest honesty and rectitude of conduct, with a fastidious regard for professional etiquette and the best traditions of the profession. Examinations could fairly test the first and second of these requirements, but no certificates could guarantee or examinations prove the possession of a sound and sober judgment, which was only of slow growth and depended on many moral and intellectual qualifications. The Institution had often been asked to adopt a scale of fees for professional work, but experience had invariably shown this to be undesirable. Reviewing the present position of the land question, the President said the principle of assessment on farm lands was still grievously unfair, but he was of opinion that the landed interests of the country were in a better condition now than they were ten years ago, though reform was greatly needed in the system of valuation for purposes both of local and imperial taxation. In spite of present difficulties and depression, he believed in the land and in its future appreciation and increasing attractiveness to the investor.



## TESSERÆ.

## Contrast and Opposition.

THE art of painting is that which will best explain to us the precise value of the words "contrast" and "opposition" when applied to the fine arts. Painting, when considered only as the technical use of colours, exists solely by virtue of opposition. What are tints, semi-tints, shades and gradations of light but points of opposition, the almost infinite variety of which is occasioned by the attempts of art to imitate the effects which nature, in a manner peculiar to herself, displays in every object in creation and in each of the different parts of such object. These wonderful effects are produced by the numerous points of opposition which the art of the painter enables him to draw from very few colours; and these points of opposition, as every one knows, consist of combinations of scarcely perceptible differences of light and shade, clearness and obscurity, strength and weakness. Painting, however, is not confined to this mode of imitating nature. It can address itself not only to the eye, but to the mind, and it can copy not only the minute gradations of colour, but those bold and striking effects which alike dazzle the senses and excite the imagination. For instance, when an unexpected change is introduced from a smiling landscape to a wild and savage country, interspersed with threatening rocks; when forked lightning is made to furrow the horizon, or when the flames of a volcano, or of a fearful conflagration, glare through the darkness of night. These are what are called contrasts in nature, and these can never be produced in painting by gentle transitions of shade, deepening by almost imperceptible degrees from light to darkness; but by sudden, bold and vigorous changes, and by using colours which afford the greatest and most striking contrasts to each other. The power of producing contrasts is one of the advantages that painting has over sculpture, which, from its nature, is incapable of contrast, and admits of only very slight opposition, and which in this particular stands alone. This appears to us the easiest and clearest mode of explaining the distinction between opposition and contrast. The same distinction between contrast and opposition which is found in painting exists in all the other fine arts; but, of course, it is most conspicuous in those arts which operate most forcibly and directly on our senses. Thus music, which cannot exist without opposition, since it consists of a succession of different tones opposed to each other, can also display, when necessary, the most striking contrasts. It can pass suddenly and abruptly from the faintest sounds to those resembling thunder; and, when employed to express the moral affections, it can glide from the expression of the softest sentiments to the noisy contrast of the most stormy passions. Poetry also consists of alternations of opposition and contrast; opposition, produced by a succession of images, which, though all are of similar nature, are yet different, and so arranged as to display their points of difference sufficiently to avoid monotony; and contrast, produced by bold and striking combinations of images, evidently and clearly distinct. The effect of contrast is, then, to carry the mind suddenly by an unexpected impulse to the enjoyment of an impression of astonishment, which, being powerful, ought neither to be of long duration nor frequently repeated. Reason and a feeling of propriety can alone fix the limits within which every principle applied to the fine arts must be confined, and these limits vary with different kinds of art.

## Constable's System.

"In art," says Constable, writing in 1829, "there are two modes by which men aim at distinction. In the one, by a careful application to what others have accomplished, the artist imitates their works or selects and combines their various beauties; in the other he seeks excellence at its primitive source, nature. In the first he forms a style upon the study of pictures, and produces either imitation or eclectic art; in the second, by a close observation of nature, he discovers qualities existing in her which have never been portrayed before, and thus forms a style which is original. The results of the one mode, as they repeat that with which the eye is already familiar, are soon recognised and estimated, while the advances of the artist on a new path must necessarily be slow, for few are able to judge of that which deviates from the usual course or are qualified to appreciate original studies." In this passage is contained both the principle of Constable's painting and the history of its results; for strange as it may seem, so little do general observers look at nature with an observing and pictorial eye—so much are their ideas of what it contains received at second-hand by reflection from pictures—that the forms under which artists have combined to represent her (forms representing, it may be, a portion of the truth, but certainly not the whole truth) have, in the great majority of cases, superseded the stamp and authority of nature; and truth itself, where it did not steal in under a conventional garb, has been refused admittance by more than one committee of taste. "What a sad thing," Constable writes to Leslie, "that this lovely art is

so wrested to its own destruction. Used only to blind our eyes and to prevent us from seeing the sun shine, the fields bloom, the trees blossom, the foliage rustle, while old black, rubbed out and dirty canvases take the place of God's own works." With his mind made up as to the course to be adopted, Constable betook himself to the study of nature on the spot. Careful drawing was his first object, as the substance to which the embodiment of colour and chiaroscuro was to be applied, and without which, though there might be effect, there could be no truth. His studies of trees and foreground are said to have been eminently beautiful. These, however, he loved to exhibit in their vernal rather than their autumnal character. "I never did admire the autumnal tints, even in nature—so little of a painter am I in the eye of common connoisseurship. I love the exhilarating freshness of spring." Buildings he did not court, but rather avoided, though in later life he grappled successfully even with architectural detail, as in his pictures of Salisbury Cathedral, but in general he dealt with it sparingly. Shipping and coast scenes he considered "more fit for execution than for sentiment." What he luxuriated in was the study of atmospheric effects and the principles of light and shadow as applied to his sylvan and pastoral landscapes. "I hold the genuine pastoral feeling of landscape," said he, writing in 1829 to his friend, Archdeacon Fisher, "to be very rare and difficult of attainment. It is by far the most lovely department of painting, as well as of poetry." "Painting," he says in another letter, "is with me but another word for feeling, and I associate my careless boyhood with all that lies on the banks of the Stour. These scenes made me a painter and I am grateful." "Whatever may be thought of my art, it is my own, and I would rather possess a freehold, though but a cottage, than live in a place belonging to another."

## Eighteenth-Century Gardens.

Thomson's poem on the Seasons is said to have had a great effect in encouraging a taste for the beauties of nature. Literary men practised what they professed to teach; they laid out grounds for friends and, where they had the opportunity, for themselves. Pope with arrogant humility professed to be prouder of his garden than of any other of his works, and is said to have given many hints to Kent. Shenstone "planted groves rural" (according to his Anglo-French epitaph), where a stream which boasts its perennial murmurs is "taught to flow" over small pebbles when the gardener turns a key, and the Naiads are invited in a pompous inscription to bathe their tresses in a crystal lake which his admirer Gilpin is obliged to confess is a muddy pond of diminutive dimensions. Kent had brought "objects" into fashion, and he set the example of building them as he would have painted them, apparently forgetting that they could be approached and that they could be viewed in other combinations than those for which they were designed. All styles, all mythologies were confounded. Here elves and fairies are invoked, there fauns and hamadryads. A Chinese pagoda looks down on a Christian hermitage. The ruins of a Gothic priory stand in salient opposition to a bran-new temple, with statue and altar all complete, to Bacchus or to Pan, and Whatley thinks these heterogeneous objects sufficiently assimilated and amalgamated by the decorative character which pervades them all. The votaries of nature had their affectations as well as the pupils of art. Liliputian groves were made to boast their deep solitudes and invite the visitor to forget the world. The whole garden was turned into a school of moral sentiment or a museum of the tastes and sympathies of the owner. To soothe "blest shades" or to please "pale ghosts," shabby urns with fulsome inscriptions are erected in the greenest and dankest corners of the walks. Abstractions enjoy a large share of deification. Here a portico is owned by Friendship and the earwigs; there a grotto beplastered with brown moss is occupied by Somnus, who in a Latin epigram promises sleep, and, he might add, a severe cold. Temples to poets and obelisks to statesmen mark the owner's literary and political predilections. Lord Temple's gardens at Stowe were political; and as his politics changed, it is said he changed the objects of his vistas and the deities of his shrines. His "Elysian fields" were studded with busts of the British worthies, and his worthies retained their titles and their pedestals by virtue of their votes in Parliament. When the spaces were considerable and the architecture handsome, this style of gardening produced considerable effect; but when attempted with insufficient means, nothing can be conceived more "paltry" and affected. It was the day of shams and surprises; views were blocked out by ugly walls or dense plantations, till they "burst" on the spectator at some favoured corner; mock towers embellished a "prospect"; Druidical temples of brick or timber (Whatley gives a recipe for making them) "added horror" to the woods; false bridges concealed the termination of artificial water, or disguised the absence of water altogether; a miniature castle or artificial ruin read a lesson on sublunary grandeur and masked a tool-house; and all this was done in the name of nature and simplicity.



## NOTES AND COMMENTS.

IN Mediæval times the Abbey or Nunnery of Shaftesbury was one of the most honoured in Great Britain. The body of King EDWARD THE MARTYR was said to have been conveyed to it after his murder. The renown of so important a relic was widespread. It was while visiting it that CANUTE died and was afterwards interred at Winchester. The wife of ROBERT BRUCE, the Scottish king, was for a year a prisoner within the abbey. Recently a local committee undertook excavations on the site. The work was commenced on June 9 and continued until November 1, when the operations were suspended until next year. Mr. DORAN WEBB has charge, and at a meeting a few days ago he announced that the cost of the work had amounted to 156*l.*, of which sum the Mayor and Corporation of Shaftesbury had contributed 50*l.* Visitors to the site and annual ticket-holders had paid 15*l.* 10*s.*, the remainder of the money having been furnished by members of the committee and others interested in this most important archæological undertaking. He said that very satisfactory progress had been made with the work and some very interesting discoveries made, details of which he hoped to embody in a report which he proposed printing at a later date. Sketches of the work will be included. In Shaftesbury there is much confidence in the successful conclusion of the exploration.

IT is anticipated that much which is interesting to architects will be discovered in the German explorations in the neighbourhood of the Temple of the Ne-Wossre Kings, who reigned in Egypt about two thousand years before the Christian era. The operations are under the direction of Dr. LUDWIG BORCHARDT, architect and technical attaché to the German Consulate in Cairo. The temple is in such a state that reconstruction, if desirable, could be attempted. There is a court the walls of which were covered with plaster; on both sides were offices or sacristies connected with the services. In a second court sixteen granite columns still remain; each is a monolith wrought like a bundle of papyri. One of the walls was of extraordinary thickness, and in it was a cavity or niche containing a statue of a lion which, judging by fragments, must have been larger than life. The execution is superior. The decoration of the temple was costly, for there were reliefs representing kings and gods. This part of the work is likely to be sent to the Berlin Museum. Many of the architectural fragments are of an important character. Some of the mummies wore coloured masks formed of linen and plaster. The graves are of many ages, and the latest must have belonged to Greeks, to whom also must be ascribed various manuscripts containing passages derived from Greek poets and dramatists. As the exploration is the first undertaken in recent times by the Germans its success is sure to be regarded as an incentive to further efforts.

IN 1887 the Royal Society of Painters in Water-Colours presented examples by the members and associates as a memorial of the Jubilee of Queen VICTORIA. Another series of portfolios has been offered to the KING and QUEEN with the following dedication:—"The happy and auspicious occasion of the Coronation of your Majesties has prompted us, the undersigned members and associates of the Royal Society of Painters in Water-Colours, your Majesties' grateful servants, to dedicate to your Majesties these drawings as a small mark of our loyalty and affection." The drawings are mounted and are enclosed in three box portfolios. The works are generally characteristic of the artists' styles. Among the contributors is the Princess LOUISE, Duchess of ARGYLL. The President has an Italian landscape. The collection is of great interest and deserves to be regarded as representative of the water-colour art of the present time. The Society has now nearly completed its century of existence, as it was founded in 1804. Originally there were sixteen members and they formed a school which has not its superior in Europe.

THE latest "Christmas Art Annual" published in connection with the *Art Journal* is devoted to the life and works of Sir W. B. RICHMOND, R.A. He is one of the

artists who need an interpreter. Hereafter he is likely to be referred to as an example of susceptibility to prevailing influences. LEIGHTON, WATTS, MILLAIS may be named among the modern masters who can be considered as affecting his work. His latest landscapes may be said to be Whistlerian. Sir WILLIAM RICHMOND is not too old to show his courage and begin a more personal expression in art. The "Annual" should be looked upon as a record of only the first part of his career. Few contemporaries have produced so many varieties of painting. He has been persistent in study and labour, and always inspired by lofty aims. The illustrations in the pages are likely to be a surprise to many readers, although they may have seen the original pictures. The exercises in sculpture should have received more attention. Versatility has held too much sway over the artist, and the biographer should not have hesitated to lament the parochialism which is likely to divert the power of Sir WILLIAM RICHMOND from art in order to exercise "a little brief authority" in a suburb.

THE French publication *L'Art*, which is true to its title by recognising the arts of all times, places and varieties, has presented as one of its large presentation plates an etching of CLARKSON STANFIELD'S *Tilbury Fort*, one of the most characteristic works of the able marine painter. As a foreign rendering of a painting that is essentially British the plate is remarkable. "Stanny" was always glad to introduce architecture in his coast scenes as in his *Ischia*, and the Italian structure which rises from the salt marshes must have been even more pleasing to his eyes than it is to most of those who sail along the river. *L'Art* is now publishing selections from the letters of PAUL BAUDRY, one of the greatest of the French painters of the nineteenth century. Another series relates to the French painters who belonged to the period between the Revolution and the Restoration. Some were Academicians, but in less than a century their names and works have vanished from the thoughts of amateurs. The sketches they made from contemporary life are very curious. *L'Art* continues to keep its position in the forefront of French publications, and astonishes as much by the quantity of its illustrations as by their quality.

## ILLUSTRATIONS.

CATHEDRAL SERIES: HEREFORD.—LOOKING INTO NORTH TRANSEPT.

NEW PREMISES, CORNER OF YORK STREET AND GARFIELD ROAD, TWICKENHAM.

THE building is in red brick and Portland stone, with shop fronts in teak and pilasters in polished granite. The work has been carried out from the designs and under the superintendence of Mr. THOMAS R. RICHARDS. York Street is a new road recently constructed by the District Council, being the main road through the town from Richmond to Teddington and Kingston, and the tram lines have just been laid through it to connect these places. Within a few yards from the building the new tram lines from Hammersmith, Brentford, &c., meet, and the street will become the main thoroughfare for business in the place. Two banks are now in course of erection there.

THE WHITE HART HOTEL, AND SHOP, CORNER OF ST. MARY'S BUTTS, READING.

THESE buildings are about to be erected in the place of some old property about to be demolished for street widening, &c. The materials will be buff terra-cotta with deep red bricks between. The lower part will be faced with glazed bricks of a deep tint. The Mansard roof will be covered with green slates and dark red tiles. The contractor for the first portion is Mr. H. W. GODWIN, of Reading.

The architect is Mr. GEO. W. WEBB, F.R.I.B.A., Market Place Chambers, Reading.

SYWARD LODGE, DORCHESTER.

LENTONHURST, NOTTINGHAM.



## THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Association was held on Friday evening last, Mr. H. T. Hare, president, in the chair.

The following were elected members:—Messrs. P. Luker, M. C. M. Leggett, T. A. Jaques, E. M. Ellis, B. E. Atkinson, un., R. W. White, A. E. Brooker, H. Hutchinson, F. B. H. Parrel, W. Jones, H. T. Tovey, H. A. Aitken, J. S. Cable, T. C. Mears, J. H. Reynolds, J. Ewing, F. J. Matthews, E. L. Hampshire, E. F. C. Buckley, H. A. Fairhead, J. C. Bull, D. Winder, A. E. Richardson, V. Hooper, S. L. C. Gilks and V. Flockhart.

## Proposed New Premises.

The PRESIDENT said it would be in the minds of all members that the question of the necessity of new premises had been before them for some years. The last president, Mr. Seth-Smith, had instituted a fund towards that end. The subscriptions received, however, were not sufficient to enable the committee to start proceedings. On October 27 last a communication was received from the Royal Architectural Museum and Westminster School of Art in Tufton Street suggesting that the premises as they stand might be handed over to the Association as their premises. This proposal has been considered by the committee of the Association and the following resolution passed:—"That the committee of the Architectural Association, having considered the communication of October 27, 1902, made by the special committee of the Council of the Royal Architectural Museum and Westminster School of Art, unanimously and heartily resolves to accept the conditions suggested in this communication by the Council in transferring their premises to the Architectural Association, subject to confirmation by the body of members in general meeting."

A special meeting of the Association to consider these proposals is to be held in the rooms of the Royal Institute of British Architects, 9 Conduit Street, W., on the 24th inst. at 7.30 P.M. Mr. F. C. EDEN read a paper entitled—

## Roof Coverings.

I have to ask your pardon to-night for two things; firstly, for what I am going to leave out, and secondly, for what I am going to leave in. I am obliged to omit much of what I might otherwise have said—as I once heard a preacher lament after an hour of violent exertion—because each of the materials with which we have to deal would supply matter for a paper to itself; and, on the other hand, some of the suggestions which I offer with great diffidence may be at variance not only with the well-thumbed rules of the text-books,\* but with the practice of those who know much more about these things than I do.

It has often been a surprise to me to notice in how many modern buildings of something more than a pretence to architecture, the roof seems to have been left almost to chance. And yet the roof exerts an influence which, though often unperceived, affects the mind so powerfully because, far more than any peculiarities of detail, it impresses the building with the indefinable stamp of character and of style. Surely it is lost labour to be, like Wren, "as nice as the pedants" about mouldings, without, as he did, devoting equal care to the covering of the roof. Just as the most beautiful stone which nature has to offer may be spoilt by stupid and mechanical tooling, or still more so by polishing, as in the case of granite, so the form of a roof may be as elegant as possible, but if the covering material be unintelligently made or mechanically applied, the roof must be ugly. Architectural beauty is, indeed, but skin deep. Goethe's maxim, "Take care of herself beautiful, for the useful can take care of itself," contains that good sense which usually lurks at the bottom of a paradox; and is especially true if we apply it to that most utilitarian part of a building, the roof. Beautiful materials make good roofs, and ugly materials, without exception so far as I know, prove in the long run to be bad materials. In reply to the question, What makes a roof beautiful, or the reverse? I suppose the answer most commonly given would be form and colour. This is only partly true. The really important quality, in my judgment, is texture. A roof may be poor and neutral in colour, as are many of the old Cornish roofs of Delabole slate (though, indeed, if she find the surface sympathetic nature usually takes care of the colouring), but with good texture the simplest roof becomes interesting and paintable. The true reason why Westmoreland slates make a better roof than Welsh is not because they are green and the others blue, but because they cannot be split so thin or be so

mechanically dressed. There is a thin green slate in the market which makes as ugly a roof as ever emanated from Port Madoc.

A feeling for texture is every whit as useful to the architect as an eye for colour. In the case of every material with which he has to deal he must make a choice between those true and false methods of workmanship on which texture of surface mainly depends. In masonry he has to choose between mechanical or sham tooling, or dragged face on the one hand and the traditional tooling peculiar to each different kind of stone on the other; in brickwork, between the thick brick with narrow joints (specified four courses to the foot) and the thin brick with wide joints; in structural timbers, between the markings of the circular saw and those of the adze; in carved work, between the tale of the tool and the trail of the glass-paper; in plaster, between the artificial, screeded level surface, with sharp arrises, and the natural trowelled face, with angles soft and rounded; in lead, between milled and cast; in window glass, between the slight convexity of crown—so valuable in external effect for its brilliancy and changefulness—and the tinny mottling of sheet or the flatness and blackness of plate; in metalwork, between the marks of the hammer, and the neatness begotten of the scratch-brush and the file. In every case he has to choose between texture and the absence or presence of it; between a monotonous surface and an interesting one. Let us, then, see how this choice may be exercised in the matter of roofing. In theory, I suppose, all are agreed as to the rightness of using local materials. It is in practice that the shoe pinches, since cheapness of transit has put so many and great temptations from Bangor and Broseley in our way. But, stale though the exhortation be, may I urge that, however monumental buildings and buildings in large towns be roofed, in the country and in dealing with cottages and other small buildings it is of the utmost importance to the landscape that the natural material of the countryside should be used rather than material imported from a distance.

One of the greatest charms of old towns and villages lies in the unity of the roofs—all of one material and all of one pitch. Here slates from Westmoreland do not jostle tiles from Broseley; here are no domes of the south to swear with the steep roofs of the north, nor are steep roofs seen side by side with flat ones; in fact, here are none of those incongruities which are popularly supposed to produce picturesqueness. This is simply the local material asserting itself, together with that feeling for unity in the roofs of a district which the builders of old always exhibited. Owing to the large expanse of a single material which most roofs in this country show—often in far larger unbroken surfaces than the walls of the buildings they cover—the material with which they are covered has a greater æsthetic importance, especially in distant views, than the material of the walls. The smaller the building the truer this is felt to be, till in a cottage the roof becomes the feature on which the beauty of the whole depends. Let us then suppose—not to be too ambitious—that a cottage is being built in a tile district. Some might prefer (for reasons which will appear) laying the tiles on riven oak laths rather than on boards or battens, bedding them, not in mortar, which either drops out or holds the wet like a sponge, but in hay, moss, reeds, dried marsh-grass, or whatever may be the available material and traditional usage of the district. The problem—almost an insoluble one—is how to admit plenty of air between the tiles while excluding fine, powdery snow. "Nobody," says Mr. R. Nevill, "who, in taking off old roofs, has ever seen the horrid mess to which the hay in a few years becomes reduced would ever think of adopting so useless and pernicious a method." Felt, he goes on to add, is no better, and after some years becomes worse than useless. A draughty cock-loft makes a dry roof. But if the aspect be much exposed, the under-side of the tiles can be torched, this method being perhaps less open to objection than bedding in mortar. Fifty degrees is a suitable pitch. What builders call the square pitch, or pitch of 45 degs., hardly ever looks right, whatever the roofs be covered with. If the roof be of the collared rafter form the timbers might be of larger scantling than the usual 4 inches by 2 inches, but spaced further apart, say 1 foot 6 inches to 2 feet from centre to centre; the intervals need not be equal. The timbers being large enough to be framed instead of spiked together, a stronger roof is obtained, while the slight sag of the laths between the rafters produces that ribbed appearance which we admire in roofs that have kept out the weather for generations, and which is the result, not so much of age as of this method of construction. Another advantage incident to the use of laths is that owing to their irregularity it is impossible to get a straight edge to the courses. The examination of ancient examples makes it clear that effects of this kind were studied and not accidental. For instance, in repairing the fifteenth-century roof of Ockwells Manor—a house evidently designed with much thought and skill—it was found that the purlins were placed at such a level that the rafters did not touch them by about 1 inch until they were loaded, and when the roof was stripped they sprang back to the straight

\* For instance:—"The Welsh slates . . . split finer and to a more uniform thickness, and are bluer in colour than the others; those from Westmoreland are rougher, thicker and consequently inferior, and of a dull greenish tint."—Seddon, *Builder's Work*, 122. "In good slating, the vertical joints of the alternate courses should range in straight lines from ridge to eaves, and the tails of the slates should be in perfectly straight horizontal lines."—*Building Construction*, Rivingtons. I. 1901 Ed. 209.



again. By this simple means the position of the principals is marked on the outside of the roof by a gentle undulation; not an untruthful method of construction, and one which serves to give delicate relief to the roof planes without destroying their breadth and simplicity, relief which we seek in vain with gablets, dormers, bands of glazed tiles and what not, whereas it is just this soft play of light and shade upon an otherwise unbroken surface which gives so much quiet charm and character to old-world roofs.

Coming to the tiles themselves, what are the characteristics of a good plain tile? What are we to require of the tile-maker? "A good tile," says Mr. J. P. Allen, "should be hard, well burnt, well shaped, non-absorbent, of good colour, and with a glazed or vitrified face to prevent vegetation" ("Practical Building Construction," p. 209). The section on tiles by Professor Henry Adams in the work called "Specification" contains this specification clause:—"Cover the roofs with first quality hard-burnt, pressed, dark Broseley tiles of approved manufacture, with ribs but not nail holes, laid to a 4-inch gauge, and each tile bedded in lime and hair mortar." Well, I think it safer to have nature on one's side rather than attempt to defy her. All she can do with "pressed dark Broseley tiles of approved manufacture," or indeed with any thin, flat, vitrified tiles, is to scale them, crack them, blacken them and finally blow them off the roof. But a rough, hand-made, sanded tile she will not only waterproof, if that be needed, but will paint it with her most delicate greys and brightest orange. Firstly, then, no Broseley or other machine-made tile can possibly, owing to its flatness, uniformity and unsympathetic surface, produce a roof with any character—a roof such as an artist would care to paint. A good tile will be hand-made. Then as to size. Some old ones are as narrow as 4 inches; 6 inches is a usual width, but I think 5 inches to 5½ inches looks better. With hand-made tiles there is no difficulty, if the order is given in time, in procuring them of any specified width, the mould, from which many thousand tiles are made, costing about 2s. 6d. The length is usually about 10½ inches, but the thickness is the really important dimension, and nothing under a full ½ inch should be used, ⅝ inch is better. Next as to shape. The set of a tile or curve in the direction of its length is given by placing it when partially dried on a shaped bed of sand, but the buckling or curve across its width is the result of hard burning. A buckled tile means a well-burnt tile and should be by no means rejected. Buckled tiles are especially useful for wall tiling, and when the sun strikes obliquely across them the effect is charming.

Texture of the surface of each individual tile is produced by plentiful sanding, and by not scraping out the mould too often in the effort to get a neat tile, as near as possible to a machine-made one. The nail holes are better punched by hand, and not by any mechanical process, as is sometimes done, even in hand-made tiles. The slight inequality in the level of the holes causes the tile to hang unevenly—a little matter, but an important one, as when each course looks as though laid to a steel straightedge the effect is unpleasant. The colour of a tile depends on the amount of iron in the sand, and on its being burnt with a clean, fierce flame such as wood gives. With wood the temperature can be more easily varied than when coal is used, and it is possible to obtain a greater intensity of heat towards the end of the burning, so as to bring about that incipient vitrification of the middle layer of the tile without affecting its surface, which makes it impervious to moisture. Needless to say, tiles should not be "selected for uniformity of colour," as some specifications require. It is only by slight varieties of colouring in the separate tiles that the colour of the roof as a whole becomes beautiful. In a good roof there are many little practical dodges to defeat the weather which all help to give interest and variety to its surface. For instance, where the tiles abut against vertical surfaces, as chimneys, gable copings, party walls and the like, they are given a slight upward tilt sideways to throw the water away from a naturally weak place. This was the case in all the old roofs at Gray's Inn, until they were relaid in recent years, when they were all smoothed out with admirable skill, so that the rain has every inducement to soak into the mortar fillets.

A similar practice is that of laying a tile flat along the verges against the end rafter. This gives a side tilt, which prevents rain water trickling down the gable face. This especially made tile, known as "tile and a half," should be avoided, as the effect of a very broad tile in every other course is unpleasant. A good tiler can work the verges perfectly well without it by a little cutting.

For ridges nothing is better than the plain half-round. It has a sanded face, like the common tiles, and is thicker—say, about 1 inch—and is bedded in hair mortar. A thickish projecting fillet of white mortar over each joint has an agreeable effect. I have not noticed it in this country, but it is the usual practice in the North of France. Special end ridge tiles do not look so well as a bottle end or pebble in mortar in an ordinary ridge tile. For the valleys it is not always necessary

to use valley tiles or lead. A pleasant effect is produced by sweeping the tiles round. This involves a certain amount of cutting and some packing on the back of the valley rafters, and unless you are fortunate enough to have an unusually skilled and old-fashioned tiler, an enormous amount of personal supervision. But I think the result is worth the trouble.

It is pleasant to think of a roof of tiles or slates as a kind of coarse drapery or tarpaulin, which roughly takes the shape of the framework over which it is thrown, softening all harshness of outline with the gentle undulations into which it naturally falls. The great enemy to be overcome in roof design is hardness. In the typical modern roof each plane looks as if cut off in one piece from some stiff and flat material, like the cardboard roofs of a badly-made model, and makes hard mathematical angles at its intersection with the adjoining planes. For all their fantastical extravagance the roofs of the Low Countries teach us this lesson—that slates, if small enough, can be made to cover any form you please—domes, bulbs, spheres, to say nothing of hips and valleys, like the scales of a fish, so that a complicated roof can be designed without a single mitred or mechanical angle.

It may or may not be true that you can always tell an Adam house by the eaves; but, anyhow, they are not a bad test of a well-designed house, for the most emphatic point in a small building is the eaves. They occur at the wall-head, to which the eye naturally travels, just where there is the most marked change of plane and of material, accompanied by a strong line of shadow. So it is easy to see that by unskilful treatment of this part the effect of an otherwise good roof may be completely marred. When the sprocket-pieces or rafter ends show, their management demands great care. Nothing can be worse than the effect of a row of narrow sprockets laid on edge, all of exactly the same scantling and all spaced at exactly the same interval—possibly all varnished into the bargain. A better way is to lay the sprockets flat; whatever you do with the rafters, to space them unequally and to vary their sizes. In small houses, where the eaves have much projection, the soffits can be boarded, lathed and plastered, or treated as a cove. With slight overhang, a cornice of wood or stone may be comfortably tucked under the projecting tiles or slates.

All eaves' gutters are something of a disfigurement. Substitute for the pleasing irregularities of the natural eaves' line a line just as hard as cast-iron can make it; in other words, fix a half-round gutter, and not only eaves, but, to a great extent, elevation also will be spoilt. Where it is necessary to collect the rain water, or where walls are thin, it is better to use wooden spouting. It may be square or V-shaped in section or hollowed out of the solid, but it must be kept small or the effect is clumsy. The downpipes in this case will be of wood with tapering heads, and will stand clear of the wall, to which they are attached by long holdfasts. When a parapet or cornice gutter is out of the question, nothing looks so satisfactory as dripping eaves. It is the rule where thatch is used, and with the majority of old roofs, though it must be acknowledged that with 9-inch walls the result would probably not justify a reversion to methods that are suitable only to good building. At the same time, it is not likely that dripping eaves have ever done as much damage in three centuries as neglected guttering and downpipes, choked with their own rust and discharging the collected water of successive seasons into the walls, have done in a single generation.

Of slate roofs, I think those are prettiest where the slates are very small and thick, and the graduation not too obvious. Old Cornish roofs are of this type: they sometimes have two or three courses of very large slates at the eaves. What are known as stone slates, such as occur in Oxfordshire and Gloucestershire, make, perhaps, the most beautiful roof of any. Of the heavy Horsham slates, as used upon Sussex houses, Mr. Dawber writes:—"The slates are very large at the eaves and diminish in the usual manner to the ridge; but they lack the finish and texture of the small Cotswold stone slates, and are more nearly allied to the heavy roofs of Lancashire and Yorkshire. We notice that directly these slates are used the pitch of the roof is flattened, for these old builders, so sound in their practical knowledge, at once recognised the impossibility of covering with heavy stone slates steeply sloping sides where all the drag and strain would be on the pegs and laths, and to this can doubtless be attributed the reason of our constantly finding these roofs cemented and stopped with mortar, for their flat pitch has the disadvantage of not always keeping the wet out without extraneous aid."

In Gloucestershire, I believe, the roofs are galletted as well as torched—that is to say, after the slates are laid they are gone over carefully on the underside, and small slips of slate are inserted in the larger crevices which arise from the unevenness of the slates before the torching is proceeded with.

When the roof is of steep pitch and shows conspicuously against the sky, lead is not suitable, except to monumental and lofty buildings, in which the proportion of visible roof to wall surface is not large. A cottage roof, with eaves 10 feet or less



from the ground, would not be a pleasing object if covered with lead. When the roof is flattish and but little seen, or entirely hidden by parapets, as in many late village churches, lead is the obvious material to use. Again, it is especially suitable to those small and highly decorated roofs such as often surrounded octagonal turrets of the Tudor period. One or two such roofs of tabernaclework covered with lead still survive at Hampton Court. These were doubtless originally brightly illuminated and gilded. On Barnard's Inn Hall is a good tower in turret form covered with lead. One of the most interesting examples of this kind of work that I know of is the old belfry at Calais, which is well worth missing a train to see.

As with other kinds of roof, so with lead, there are several devices in the laying invented for purely practical reasons, but which lend aesthetic effect and interest. For instance, in many old churches, including Exeter Cathedral, the sheets are not laid parallel to the gable copings, but strike into them at an angle. Then, too, the boarding under the lead in Mediæval roofs was not close laid, but with gaps of about 2 inches between each board. The motive of both these devices was, by increasing the friction to keep the lead from creeping, and each gives some interest to an otherwise mechanical surface. The boarding in old roofs is almost invariably oak; with modern imperfectly seasoned wood chemical action is set up and the lead perishes, but if the boarding be thin, say  $\frac{1}{2}$  inch, and water seasoned, I believe it is safe to use oak; however, no doubt desilvered lead is more easily acted upon by acidulated vapours than the lead which was used before 1840, when the desilvering process came into use. In modern roofs the rolls are often too big, owing to the use of a wooden core. A felt is better, except in flats, where there is likely to be much walking about, and the wooden roll is a necessity. There is no practical reason why the sheets should all be of equal width and a very good æsthetic reason why they should not be. I do not say that they should vary to the extent noticeable in old roofs where there has been much patching, but just enough to destroy the mathematical accuracy which teases the eye.

In old English roofs there is no ridge roll, but the sheets are lapped over several feet at the top and I believe the ornamental ridge was rare. There is the well-known exception at Exeter, where the ridge of the cathedral has a simple cresting of fleurs-de-lys. Old prints of Holyrood show a beautiful ridge of crowned roses and thistles; but here, no doubt, French influence was at work. On church roofs one may often see the dates at which repairs were executed accompanied by the churchwardens' initials. These are cast on the sheet, and some of them, as at Minster, in Thanet, are elaborate and interesting. There is some suggestion for ornamentation in this. A simple powdering of symbolic or heraldic device, gilt, might be worth attempting. The old lèche on King's College Chapel, Aberdeen, is decorated after his fashion, with monograms, lily-pots, thistles and crowns. The roof of the cathedral at Troyes is said to have been diapered with golden flames. But it is easy to overdo these things, and I think some of the elaborately tinned and painted French roofs of which one reads must have been overdone.

Gilding is as a rule safe enough. In the East domes are often gilt all over. In Western surroundings the effect might be unpleasant, but parcel gilding, as on the dome of the Invalides, is most valuable. I should like to see the ribs on the dome of St. Paul's so treated. The effect would not be in the least barbaric, but refined, owing to the delicate effects of the curvature of converging ribs which would be brought into relief by the gold. The lead used should be cast, not milled. "It is almost useless," says Mr. Lethaby, "trying to put interesting workmanship into dull and poor materials. It must be allowed that modern sheet lead has a poor, mean, rushed mill-board look, and its wretched colour puts it quite out of court as anything but a mere makeshift. Cast lead, on the contrary, has a beautiful surface, it is cast with the greatest ease, with the most simple of appliances, and does not blacken by exposure to the air as milled lead does. . . . In gutters and flats cast lead should be used, if for practical reasons alone. . . . It is said that milled lead was introduced into England about 1670. The plumbers of the time opposed its use and said it could not be durable. The Milling Company replied by offering to keep milled lead of 7 lbs. a foot in repair for forty years for an insurance of  $\frac{1}{4}$  per cent. That to me seems saying very little for the material; it would have said little in the Middle Ages at least. Then the forty years' view of things had not been invented."—*Journal of the Society of Arts*, lv. 456.

The greater number of lead-roofed buildings have parapets or cornice gutters, but in many old churches there is no gutter, and the lead hangs easily over the eaves like a frounce, which gives a curiously forlorn look not without charm. It is just his gentle dressing of the lead which is so appropriate. Modern plumbers like to dress lead far too hard, especially where, as over cornices, they have a fillet to dress it to. The result is that the drip is spoilt, and the water runs back over the members of the cornice and down the wall.

Thatchers must be a stubborn race, for they have preserved the traditions of their craft in spite of modern improvements, and though the best materials are not now available, reeds being no longer grown for the purpose, and wheat straw being too much broken by threshing machinery, their work seems to be as well done as ever. Neatness, which is the bane of slate and tile roofs, is most appropriate to thatch. The more it resembles well-combed fur, and the less it suggests a heap of sodden refuse, the better.

The characteristic beauty of thatch is the grace and ease with which it undulates over hips and dormers, and projections of every kind, combined with the curious sense of snugness which it conveys. No eaves gutters are used, and no flashings are necessary against stacks or gable copings. If the walls are plastered a coating of tar about 1 foot 6 inches high along the base is a sufficient protection against damp.

The thatchers' trade is slowly dying out. Between the years 1851 and 1891 their numbers declined from 6,000 to 3,000; and it is to be anticipated that they will not be able much longer to resist the inroads of improvement and the superior attractions of corrugated iron.

Mr. H. D. SEARLES-WOOD, who proposed a vote of thanks to the reader of the paper, said he was too great a philistine to agree with all that Mr. Eden had said. He, the speaker, had a personal experience of some of the experiments proposed in the paper, and they did not recall happy results. He was therefore out of sympathy with many of the methods mentioned in the paper.

Mr. MAURICE B. ADAMS seconded the motion. He said he was somewhat in sympathy with many of the methods mentioned in the paper, though he was sure there were practical difficulties in the way of their adoption. Local by-laws and other restrictions by governing bodies would often make it extremely difficult to carry out the suggestions.

Mr. H. LOVEGROVE, who supported the vote, disagreed with almost all the proposals in the paper. Architects had to satisfy their clients, and few of the suggestions would find favour with them, therefore they hardly seemed practicable. He was sorry Mr. Eden had not dealt more with the practical details of roof-covering, because the roof of the house in every country was of importance. The Dutch and Swiss roofs were very picturesque, and the people attached so much value to good roofing that they even built movable roofs to protect their crops.

Messrs. R. H. WEYMOUTH and LOUIS AMBLER supported the motion.

The PRESIDENT in putting the vote to the meeting said the paper had certainly given rise to a great diversity of opinion, and there seemed to be a little confusion. Some of the speakers did not realise that which Mr. Eden had in his mind. The paper probably dealt only with roof-coverings to cottages and houses in the country, and not with those of town houses. The text-books were most misleading concerning materials to be used in construction. It was absolutely false to say that a hard material was more endurable than a soft one.

## RELATIVE PERMANENCE OF STEEL AND MASONRY CONSTRUCTION.

(Concluded from last week.)

W. HILDENBRAND, M.Am.Soc.C.E.—With reference to the old Roman viaducts and aqueducts mentioned in this discussion, which are frequently quoted as evidence of the longevity of stonework and its superiority over iron structures, the speaker wishes to draw attention to the fact that in other Roman structures may be found equal evidence of the durability of iron. Remnants of bridges over the Rhine, built by Julius Cæsar, have been dug up during the past fifty years, while the work of regulating the bed and current of the Rhine has been going on. In Cæsar's "Commentarii de Bello Gallico" one of these bridges is minutely described, corresponding in construction to what would now be called a timber trestle, consisting of heavy oak logs connected with iron bolts, clamps and spikes. Quite a number of these logs were found under the bed of the river, nearly 2,000 years after they had served for carrying the Roman legions over the Rhine in their attempt to subjugate a free nation, and the timbers, as well as all iron bolts and spikes, were in a perfect state of preservation.

This fact corroborates Mr. O'Rourke's assertion that iron submerged in pure water will probably never corrode.

Of course, every object in this world perishes, or, rather, disintegrates and changes into some other form, but if building materials can be preserved for several thousand years, it may be said that, for all practical purposes, they last for ever.

The question whether metal will in the future be considered as permanent and durable a building material as stone cannot be solved at the present time, and it is not likely that



any who are here will live to see it solved. The answer to the question cannot be found by theorising, but depends entirely on experience, which should extend over centuries.

At present we have, so to say, no experience at all about the durability of iron or steel structures. It is barely sixty years ago that the first iron bridges were built, and it is doubtful whether a single one of that age is in existence to-day. Nearly all the early iron bridges have been removed and replaced by modern structures, not on account of having been decayed or weakened, but because they had outlived their usefulness, and stronger ones were required to accommodate the increased and heavier travel of modern times. Our experience as to the durability of iron and steel structures, therefore, is very limited, and only of recent date.

If a stone building and a steel building were erected side by side, and both structures were left to themselves, without any attempt to protect them against the effects of the atmosphere, there is no doubt that the stone building would stand very much longer than the steel building. In New York city there is an example in the New York and Brooklyn Bridge. The massive stone towers, which are now more than twenty-five years old, have no protection against the weather and have never been repaired. They are to-day as they were left by the hand of the mason twenty-five years ago, and, according to a recent thorough inspection, they are just as good and perfect as they were on the day they were finished. On the other hand, the steel and wirework requires constant attention; there is hardly a time when no men are seen suspended in the meshes of the wirework repairing something or putting on a coat of protective paint.

The speaker has had the opportunity of examining suspension-bridges erected more than forty years ago, and while he found the cables as a whole in perfect condition, he also discovered one or two places where, through the accumulation of water or through imperfections in the protective paint, the wires were considerably corroded and needed repairs. All of this shows that metal structures require attentive watching and constant renewal of paint or other protective coverings, and that any oversight or inattention is followed by grave consequences.

With our present knowledge, therefore, we may sum up by saying that unprotected masonry, as well as unprotected ironwork, is perishable, but that the former will last much longer than the latter. However, if iron or steel be well protected, it is known that it will not decay in thousands of years, and will be as durable, if not more durable, than any stonework. Will the means for an efficient and permanent protection of steel ever be discovered, or will a new metal be found which has the same strength as steel, and which naturally is not subject to oxidation?

H. S. Haynes, M.Am.Soc.C.E.—Mr. Hildenbrand has referred to iron bolts in bridges built by Cæsar across the Rhine. In the Colosseum, built about A.D. 80, the courses of heavy travertine masonry, laid with knife-edge joints without mortar, were connected by iron cramps fairly well protected from the weather. Many of these were cut out in the Middle Ages, but those which remain appear to be in good condition. The vault of the Pantheon, 140 feet in diameter, is of concrete supposed to be strengthened with iron rods. This vault, built about A.D. 125, is, to all appearance, in excellent condition. From these instances, it would seem that iron used structurally in connection with stone or concrete masonry may remain efficient for nearly 2,000 years.

Iron is not readily oxidisable in pure water, for the oxygen therein chemically combined is only separable at an excessively high temperature. It is the atmospheric oxygen ordinarily present in water that is the oxidising agent. Water absorbs carbonic-acid gas to an extent equal to its volume, and the water thus acidulated acts powerfully upon iron or steel. It follows that in large cities where the atmosphere is heavily charged with the products of combustion the falling rain would be correspondingly charged with carbonic-acid gas, and therefore that the effect of oxidation upon steel construction should be proportionately greater from exposure under such conditions.

A. L. Johnson, M.Am.Soc.C.E.—In reference to a statement concerning the corrosion of the steelwork in the large buildings in Chicago, C. T. Purdy, M.Am.Soc.C.E., was one of the members of a commission to examine and report on the condition of those buildings. The speaker having talked with Mr. Purdy recently concerning this matter, it may be appropriate to give some of the results as described by Mr. Purdy. His report has undoubtedly been printed ere this, and probably, therefore, there will be no objection to the promulgation of the information at this time. The commission examined quite a number of the buildings in Chicago and found numerous cases of corrosion in the columns; but it was not developed that the corrosion was confined to the outside columns, or even that it was greater in them than in the interior columns. The beams in the foundations, Mr. Purdy said, were found to be in uniformly good condition. The commission's recommendation

would be that in future all the steelwork for these buildings should be entirely surrounded by a Portland cement or lime mortar, this covering being filled in solid behind the fire-proofing.

In St. Louis a very well-constructed building, erected about twenty years ago, is now being dismantled. The construction consisted of solid external walls, cast-iron columns throughout the interior and steel beams painted with red oxide of lead paint. The building was eight storeys high and of fireproof construction, the floor arches being mainly of brick, though there were also some concrete arches. The steel throughout is in a thoroughly well-preserved condition, it having been in a cases entirely embedded in Portland cement mortar or concrete covering. The paint also has been thoroughly preserved and, in the speaker's estimation, an embedment in Portland cement mortar is the only means of preserving that preservative.

Professor Spencer Newberry, manager of the Sandusky Portland Cement Company, recently gave a lecture in Chicago which the speaker regards as one of the most valuable articles with regard to steel-concrete construction that has appeared in print for some time, covering, as it does, all sides of the question, and some sides in an entirely new manner, such, for example, as the theoretical considerations involved in the preservation of iron by Portland cement covering. In this article he shows that the cement, theoretically, is not simply a neutral or non-injurious agent, but is actively engaged in preventing the formation of rust.

The speaker's company has samples of steel embedded in cinder-concrete, in the form of broken pieces of a test-span made in the fall of 1898 and tested in February, 1899, these pieces having lain on the ground uncovered, subject to the action of the elements, for more than three years. On numerous occasions these pieces have been broken open for the purpose of observing the condition of the metal, the most recent case having been before the Engineers' Club of St. Louis last January, in connection with a talk given by the speaker, and in all cases, without any exception, the metal has been found to be as bright and clean as the day it came from the rolling-mill. The quality of the cinders in this sample was considered very poor, containing a good deal of dirt, and the fine material was screened out. This the speaker regards as desirable, though not absolutely necessary, where cinder-concrete is used, inasmuch as, if it is not done, a slight film of rust will be formed on the metal. This film, however, never increases in thickness, but as it costs little to avoid it the best practice would call for the screening of the cinders. In the speaker's opinion the reason for this difference in action is due to the fact that the fine stuff contains finely divided particles of sulphur, which are readily dissolved by water, slightly acidulating the same, and until the concrete dries out thoroughly a slight corrosive action is taking place. This is soon neutralised by the influence of the Portland cement, but not before a film of rust, not in itself materially injurious, is formed.

Mr. Darrach has expressed himself as of the opinion that at the present time we are not able to calculate the strength of steel concrete beams with any degree of accuracy. The speaker, of course, will have to take exception to that statement, he having on numerous occasions endeavoured to show how this could be done, and, being of the opinion that the data with regard to the materials used being known, he could arrive at the maximum carrying capacity within about 15 per cent., which is certainly close enough for all practical purposes, in view of the factor of safety used. Of course the strength and the modulus of elasticity of the concrete and steel must be known, and, as to the former material, these functions are seldom accurately known, chiefly because no special tests are made to determine this for the materials available for that particular work. Their influence on the character of the design is enormous, and, on work of any considerable size or importance, these values should be obtained before the designs are prepared.

As to the relative lasting qualities of the different kinds of engineering structures, the speaker is of the opinion that only a few forms of stone masonry can compare in length of life with a concrete construction reinforced with steel properly distributed through the cross-section. Strange as it may seem to those not conversant with the facts, the maintenance-charges for stone masonry on many railroads exceed these charges for steel structures in proportion to the relative quantities of each. On railway work it is usually a condition of taking what you can get rather than what you would like to have. Many forms of sandstone are worthless. Limestone is dissolved in the course of time by atmospheric influences, and there are really only a few kinds of stone that can be considered as everlasting, and these are usually so expensive as to prohibit their use. A very good example of the dissolution of limestone masonry is afforded at the Cabin John Bridge. Underneath the arch may be noticed stalactites forming along the line of the mortar joints between the granite arch-stones from the spring-line some distance up toward the crown. The back-filling of the arch consists of a considerable depth of limestone-rubble



masonry. A considerable quantity of water finds its way down through the haunches of the arch and then through the mortar joints of the arch-ring, and the stalactites indicate that the air and water are dissolving this limestone backing. This same action exists to a greater or less degree in all limestone structures.

In a large city in Indiana the speaker recently examined some limestone bridge-masonry which had been in place for about forty years, and much of it could now be scraped up with a fire-shovel.

In the speaker's opinion plain concrete construction would not be everlasting, on account of the cracks which are almost certain to develop in such structures, these cracks filling with water and freezing in the winter, and gradually getting worse and spawling off as the years go by.

In steel-concrete construction, if the metal is properly distributed and proportioned to the cross-section, these cracks can be absolutely prevented. The speaker's company has built walls 300 feet long, with steel reinforcement, in which no expansion-joints were provided, and in which not a sign of a crack is to be seen, and would take a contract to build such a wall a mile long under this guarantee.

To accomplish this result, however, it is necessary to have a subdivision of the metal reinforcement into small areas thoroughly disseminated through the section, just as in successful arch construction it is necessary to have the metal thoroughly disseminated in small areas through the upper and lower portions of the sections. Heavy concentrations of metal at points 2 or 3 feet apart will not give the peculiar stretching quality to the concrete obtained by the other method, and which is essential to success.

When properly built, this steel-concrete construction will not crack, will not be disintegrated by frost, will not be dissolved by the elements, and, in the speaker's opinion, is the only kind of engineering structure that can be considered permanent, with the exception of one or two kinds of rock masonry, the cost of which in most cases would be prohibitive.

F. Lynwood Garrison, Assoc. M. Am. Soc. C. E.—Since there seems to be some confusion or misunderstanding regarding the corrosive action of atmospheric and other influences upon iron, it might be advisable in this discussion to state briefly a few of the most important characteristics of metallic iron that are pertinent to the subject, although in so doing the risk of repeating some well known facts must be incurred.

1. To begin with, iron is one of the metals most easily oxidised and affected by moisture, consequently it never occurs in the metallic state.\*

2. Iron does not undergo any alteration in pure dry air at ordinary temperatures.

3. In moist air iron becomes coated with ferric oxyhydrate, having approximately the composition  $\text{Fe}_2\text{O}_3(\text{OH})_2$ . The rust varies in composition with the conditions under which corrosion takes place.

4. According to Percy, iron does not rust unless there is an actual deposition of liquid water upon the surface of the metal.†

5. The presence of certain gases and vapours, even in minute proportions, such as sulphuretted hydrogen ( $\text{H}_2\text{S}$ ), hydrogen, chlorine and acetic acid, accelerates rusting in moist air, though no liquid water may come in contact with the metallic surface. Carbon dioxide ( $\text{CO}_2$ ) and ammonia gas are said to act less energetically in this respect.‡

6. Iron rust often contains minute quantities of ammonia, due, it is supposed, to the decomposition of the water by the action of the oxide on the metallic iron, the oxygen combining with the iron and part of the hydrogen uniting in the nascent state with the nitrogen of the air.

7. Pure water deprived of air appears to be absolutely inert as far as corrosive action is concerned on contact with iron, even at 100 degs. C.§

8. Rust formed far beneath the water consists of black hydrated magnetic oxide.

9. The formation of rust takes place in the beginning but slowly; after a thin coating has once been formed, the corrosive process goes on more rapidly.

10. Aqueous solutions of potash, soda and ammonia preserve iron from rusting, provided they are not too dilute.

11. Water containing not more than one-fifth its volume of lime water is said to preserve iron from rusting.

12. The contact of iron with more electro-positive substances, such as zinc, retards corrosion; whereas contact with more electro-negative substances, such as tin, lead and copper, accelerates the rusting.

13. Magnetic and similar oxides of iron, which constitute

the basis of iron scale, protect the iron which they coat, but hasten the corrosion of rusted iron, whether such be the adjacent portions of the same piece or in separate pieces which are galvanically connected. This protective action is shown by the comparatively slow rusting of Russian sheet-iron, of "blued" iron, and of castings that retain their original skin.

14. While contact with zinc and highly zinciferous brasses retards rusting, contact with copper, or brasses rich with copper, hastens it.

15. According to Martell, the purer qualities of mild steel when used in ship-hulls are more likely to be corroded than impure iron. A steel ship requires more care than an iron one. Nickel steel is not so likely to be corroded in salt water as the ordinary and purer grades of steel.

This array of more or less well-known facts might be indefinitely elaborated; however, it covers the subject completely in a general way. It seems to be a perfectly sound conclusion that, other things being equal, where likelihood of corrosion is effectually prevented, iron (steel) makes as permanent and durable a building material as masonry. Better, in fact, for whereas the latter will certainly in time disintegrate, the former cannot. Unusual conditions may certainly exist in which the molecular structure of the metal may change; such, however, must be regarded as abnormal and exceptional.

A statement has been previously made in this discussion to the effect that, inasmuch as iron properly covered with fire-proof material or concrete will not corrode, uncovered iron in the interior of buildings will be immune from corrosion because it is then covered from the weather on all sides. Were walls and roofs absolutely water or moisture proof, in fact, if the buildings were hermetically sealed, top, sides and base, then, and then only, would the interior metal be free from corrosive influences. As a matter of fact, in most cases, the dangers from corrosive deterioration are much exaggerated; the greatest objection to steel buildings is their instability in fires. Mild steel, at a white heat, is about as stiff as cheese, whereas masonry is not affected in the same way at high temperature, and resists collapse to a far greater degree.

The speaker's belief is that in practice a thick covering of cement concrete is the only material that absolutely protects iron from corrosion. Such a compound structure unites the advantages of both component materials, and greatly surpasses in strength and durability an edifice made of either alone.

All are familiar with the remarkable strength and endurance of "wire-glass," the glass sheet being cast and rolled so that the wire net is completely covered with the glass, imparting to the natural fragility of the latter a certain amount of elasticity and abnormal strength; the glass, in turn, absolutely protecting the wire from corrosion. So long as the wire is covered such a composite sheet will hold together, unless broken by a force greater than the tensile strength of the wire.

Not being a structural engineer, the speaker may be unfamiliar with certain objections to composite concrete and metal structures; in his ignorance, however, he cannot but think that such compound constructions will be the true and logical line of development in the future.

## LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.

THE following address was delivered by the president (Mr. Butler Wilson, F.R.I.B.A.) at the opening meeting of the session on the 6th inst:—

When I had the honour of addressing you last year it was with a full sense of the responsibility which belongs to the occupation of this chair. The fact that you have done me the honour of re-electing me to this position has intensified my realisation of what is due to you and what is expected from your president.

The opening meeting of our session is a fitting occasion to refer to some of the considerations which I venture to think have affected, and will still further affect, not only our interests as architects, but also the interests of our clients. Perhaps it is within your recollection—if not, you will permit me to remind you—that the subject that occupied our attention last year was the necessity for "enthusiasm." However much we may have imbued our minds with this great quality, we constantly find our enthusiasm "cribbed, cabined and confined" by relentless present-day needs and conditions. To-night I shall refer to some of those ever-increasing difficulties which beset the path of the most enthusiastic.

I will first speak of the difficulties which interfere with the realisation of perfect planning. It is often our happy lot to have at disposal a situation for our building which imposes no restraints and presents no difficulties. Then, indeed, we have only ourselves to blame if the result is not all that it should be. On the other hand, we may have to deal with a site which bristles with obstacles and restrictions. In such a case let us never make the fatal mistake of endeavouring to place there a

\* Exceptions must be made where the iron is of undoubted meteoric or non-terrestrial origin. In such instances it is usually alloyed with a large proportion of nickel.

† "Metallurgy of Iron and Steel," p. 27.

‡ Bonsdorff, "Répertoire de Chimie," vol. iv. p. 171.

§ Mallet, "Report British Association, 1840," p. 229.



preconceived arrangement, only suitable for some totally different situation; rather should we endeavour to turn obstacles into advantages, and let the peculiarities of our site give rise to a building which shall almost convince the beholder that no better situation could have been chosen. Some examples of what has been achieved in this way will occur to you. I might mention the Palazzo Massimi, Rome, one of the finest examples of the culminating period of the Italian Renaissance, which is built upon a confined and extremely irregular site, and is a beautiful display of the keenest judgment and ingenuity of planning under the most adverse conditions.

The art of planning in former times was confined to a very few types of building, which did not call for much variety, and there were plans characteristic of these buildings which became models and were handed down from century to century. But we are confronted by the requirements of to-day, which embrace the conditions of modern progress. New trades, processes and industries spring into existence, and must be suitably housed and provided for. Hotels, industrial dwellings, hospitals, workhouses, public baths and libraries, places of entertainment and other structures, supplying a multitude of wants, can only be successfully dealt with by a careful study of their needs and workings. Though we all may have the desire to make ourselves thoroughly acquainted with our client's needs, and do make every endeavour to that end, those endeavours are often met by ill-concealed indifference on the client's part. This indifference often expresses itself in some such words as these, "Get the building finished, and we will adapt it to our requirements."

But, gentlemen, we must not be satisfied to rest here. We must often go to the length of extorting from the client or his employes the information of which we are in search. In short, we must get to know more about the working of our client's business, from our point of view, than he knows himself. Let us be even in advance of our client's ideas, not only thoroughly up to date, but as far in front as may be. It is our business to discover some advantage which, although our client may have had it vaguely in his mind, he has not been able to formulate. We must be determined to fulfil requirements in a far more complete way than our client has ever imagined. By these means we can enhance the reputation of our profession as a body of men who are capable of making suggestions and giving advice of the greatest value to those who are retaining our services.

An architect was recently called in to design a building to be fitted with machinery, and the client took exception to what appeared to him to be the unnecessary inquiries of the architect, as to the number and size of the machines, amount of working space and other details. His idea was that he had employed the architect to erect a building upon a given space, and that he should be concerned only upon the erection, and the client would then place the machines in situ without any assistance from him. Nevertheless, the architect made diligent inquiries of the actual users of the machines, which resulted in a very slight alteration in the width of the building, thus enabling an additional row of machines to be placed within it. On perceiving this, it dawned upon the client that the architect's method of meeting the requirements was correct, and more especially when he saw that the architect had made himself thoroughly acquainted with some of the workings of the business, and would not allow him to make such a vital mistake as would otherwise have occurred.

Another difficulty which confronts us is that of adapting the acknowledged forms of architecture to the ever-increasing advantage of modern constructive inventions. The architect of the past was governed by the constructive materials which were at his disposal. Architecture possesses both body and soul. It is a unity of matter with imagination, and while we are endeavouring to infuse our schemes with the imaginative element which should never be absent from architecture as a fine art, we are hampered at every step by the intrusion of the constructive as opposed to the reflective element. This fight between material and imagination does not decrease with the advance of time, and there is no doubt that many accepted forms are under certain modern conditions far from applicable to functions which this age demands. These demands are not likely to grow less. The times are giving birth to them in bewildering profusion. To grapple with them, and at the same time preserve the essential qualities of our art, is the task which lies before us at this present moment. It seems to me that this can best be done, not by ignoring or rejecting inventions and appliances which, on the grounds of their practical utility, have come to stay, but by a frank acknowledgment and acceptance of their value and a determination to make them our servants rather than our masters. We must be ready to progress in this respect, and to seize upon all that is best in modern constructional methods, for there is no law born of past experience which may not be instantly repealed owing to the appearance of new conditions and materials. If architecture as a fine art is to live it must adapt itself to present needs, and the difficulties that face us.

are the requirements and problems of to-day. It will be obvious that the architect of to-morrow will be faced with difficulties unknown to us, and with this feeling it will be somewhat easier for us to face the facts which call for our efforts.

In former times, as the architect considered himself fully equipped to practise his art by a knowledge of the five orders, so the building was erected by means of the five trades. Different conditions prevail to-day. Not only is an acquaintance with the five trades necessary, but an acquaintance with others which, fulfilling modern requirements, demands our recognition, and their name is legion. We have amongst others fireproof iron and steel construction, terra-cotta and faience, electricity, heating and ventilation, concreting, asphalt, draining, artificial stone, hydraulic and mechanical appliances, elevators, wrought metalwork, mosaics, glass, furniture and decoration, horticultural and landscape gardening.

Iron and steel have almost ousted carpentry from buildings of any size, and our equipment is far from complete if we do not make ourselves thoroughly acquainted with the various systems of fireproof construction. The arrival of the flanged beam and iron joist marked a great era. Steel, combining as it does the virtues of cast and wrought-iron, can be utilised for supporting enormous loads. Its uses and applications are governed by formulæ the outcome of exhaustive experimental tests. How far the employment of this material may be carried is shown us by our American brethren in the skeleton skyscraper. The idea that constructive metalwork needs concealing from view is rapidly dying out, and a feeling is taking its place that iron construction should be frankly exhibited. Our leading architects do not now disdain the use of rolled girders in the decorative treatment of ceilings. Again, we have steel roofs, which have changed all our canons of design and caused us to abandon former methods. The advent of architectural faience has resulted in the superficial decoration of our structures. There are new and various inventions connected with the construction of fireproof floors and partitions. We are now able to build a partition 2½ inches in thickness, which our local authorities recognise as a 9-inch brick wall, for fireproof purposes.

To enumerate all the valuable inventions which are now ready to our hand is beyond the scope of this address. Briefly I would impress upon you that architects are indeed feeling the steady invasion of the technical constructor. Technical construction is advancing, so must we, not lagging behind but marching ahead of it. If we relax our watchfulness we afford opportunity for the constructive specialist to gain an ascendancy, and irrevocably forfeit our position as chief controllers.

Leaving the question of construction, there is an invasion which, if it is allowed to continue, will end in disaster; an invasion of the domains of our art by a commercial element coming forward and successfully luring numbers of our brethren to relinquish their hold upon the æsthetic side of architecture. The busy practitioner is tempted by the readiness of the trade to relieve him of the arduous work of design. The tempting words, "Designs furnished free," are constantly meeting his eye. The terra-cotta manufacturer, the cabinet-maker, the mosaic worker, the glass stainer and the ornamental plasterer offer "designs free." I counsel that on no account should we accept their offers. Any such acceptance will disgrace our profession. We can design for ourselves—if we cannot, we are not worthy the name of architects. Some may say that whether the architect or tradesman designs, the client is only paying once for his art. This is a fallacy. You cannot get anything for nothing. The tradesman will see that he is paid for any work he does, including his "designs free." To suggest that the trade have become designers owing to the incapacity of the profession becomes an intolerable charge. Those who labour at design to give their best, as much for their delight in the work as for the remuneration they receive, must view these offers of "designs free" as an insidious encroachment upon the honour and rights of our profession.

And now, gentlemen, to speak of "Architecture as an Art." Our great ambition is to clothe our buildings with some part of the qualities of proportion, dignity, poetry, and imagination; those elusive and indefinable qualities of great architecture, the attainment of which may not come, even after a life-long searching. The architect who commands these qualities and cannot help it will invent work of beautiful proportions, but it is as impossible for him to impart to others the means by which he does so as it would have been for Shakespeare to instruct as to how a play should be written.

The laws of proportion are too subtle to be propounded, the qualities of grace too elusive to be enumerated. Although we cannot readily acquire that which shall enable us to attain our object to the full, we can do something to prevent ourselves committing gross errors. We can at least store and again store our minds by the study of acknowledged types of beauty. If we possess any receptivity, such a study cannot fail to leave permanently in our memory some residuum of appreciation for grace, some sensitiveness to all that is bad in form, proportion and workmanship. It must help us to know



when we have done something which is ungracious—help us, in short, to become our own severest critics.

Let us try and produce that which is expected of us by our fellow-workers. We know well that the most gratifying reward of our labours is the appreciation of our brethren, who are so alive to the difficulties which they themselves have to grapple with. The true artist is concerned as to what his fellow-artists will think of his work. To accomplish our end we as enthusiasts must engender in our minds that sensitiveness to both good and bad without which nothing beautiful can be created.

Having spoken of the approaching invasions of our art and the difficulties which beset the enthusiast, I will now endeavour to point out the means by which the invasions may be resisted, the difficulties overcome. Our battle-cry is education.

As Sir William Emerson said in one of his addresses at the Royal Institute of British Architects, "There can be no doubt that the most important question of the moment is the necessity for a better and more methodical system of education for our students in architecture than exists at present. The pupil, as a rule, picks up his knowledge piecemeal, in a haphazard sort of way, with but little attention from the one who really could teach him. Then in order to pass the Institute examination the student crams with teachers. The cramming may have the result of passing him, but it leaves him still inadequately educated. Further, there is in all our schools too much concession to temporary or ephemeral fashions, notwithstanding many good examples of work done by our architects of this century in various defined, sober and self-restrained styles. Men such as Barry, Scott, Cockerell, Soane, Nash, Wyatt, Pugin and Burges knew the groundwork of their art thoroughly, and this knowledge was the cause of the purity, dignity and good proportions of their designs. There is much talk at times of Palladio, Michel Angelo and other old masters, but I wonder how much the average architectural student really knows of any one of them?"

Severe and systematic courses of tuition exist abroad. In France we have the Ecole Nationale des Beaux-Arts. In Italy there is the Academy of St. Luke, and Germany possesses a number of excellent training schools; all the foregoing establishments being under the control of their several Governments. In the universities, colleges and technical institutions of America there are some half-dozen or more first-class training departments in architecture, which have now reached such efficiency that their students are ceasing to go to France for the purpose of study. And the best American architects are often university graduates to begin with. All these countries have felt that the interests of the community and the State demand the efficient education of the student of architecture.

Where is the architectural student, who lives within the area embraced by this Society, to receive his training? According to our memorandum of association, the first object for which our Society exists is "to afford facilities for the study of architecture." Let us consider in what measure we have justified our existence in this respect. As you will have seen to-night, we offer prizes for measured drawings, design, construction, essays and sketching. All this is very good in its way, but is far from approaching that complete system of training and education with which we hope to see our future confrères equipped, and we feel that we have much to accomplish before we fulfil our mission. In furtherance of this, I had the honour to propose in July last the following resolution, which was unanimously passed by your Council, viz. "That the Leeds and Yorkshire Architectural Society take the necessary steps to found a school of architecture, to be conducted under its auspices and patronage, to afford facilities to Associates for the study of architecture." Your Council also considered the following suggestions, viz.—"The name of the school to be 'The Leeds and Yorkshire School of Architecture.'"

The objects for which the school is established are:—(1) To afford facilities for the study of architecture. (2) To assist students to fit themselves for their work as architects. (3) To assist students in passing the examinations which qualify for studentship and associateship of the Royal Institute of British Architects. "The students to be under the direct control of a thoroughly qualified architect as master, who shall be nominated by the Council of the Leeds and Yorkshire Architectural Society. Students wishing to join the school to be first registered as 'student of the Leeds and Yorkshire Architectural Society.' After payment of the fees for the first year's course, students to be eligible as associate members of the Leeds and Yorkshire Architectural Society without payment of the usual entrance fee, and as associate members they are to be eligible to compete for the prizes and studentships offered by the Society. Curriculum to be based upon that of the Architectural Association of London."

Your Council realised that this resolution could not be put into immediate effect, that it would therefore be some time before the proposed schemes could be fully carried out, and still keeping before them the accomplishment of their aims and

ambition, cast about to provide our students with facilities as nearly approaching our ideal school as present circumstances will permit. They approached the Leeds Institute with a view of ascertaining whether that Institution would, with the assistance of this Society, extend the existing facilities for architectural training. The response was most encouraging. The committee of the Institute signified their willingness to co-operate with this Society to the extent of accepting the following proposals, viz. "A room to be set apart for the sole use of the students of the school. The master to be nominated by the Council of the Leeds and Yorkshire Architectural Society. A representative of the Council of the Society to have a seat on the committee of the institution. Members of Council of the Society to be received as visitors to the classes. Prizes and studentships offered by the Society to be competed for by Associate students. The minimum amount to be expended on the above by the Society to be agreed upon." By these arrangements we have at least achieved that which, I venture to think you will agree with me is the nearest approximation to the spirit of the resolution; and, gentlemen, it is most gratifying to me to be able to inform you that when the new buildings are completed there will exist in the city of Leeds a school of architecture which should justify its title.

### HONEYCHURCH.

AN appeal has been issued by the Bishop of Crediton on behalf of the preservation of one of the most ancient and most interesting churches of the diocese of Exeter, that of Honeychurch. This edifice is one of the few Early English churches in Devonshire (perhaps the only one) that was left almost untouched by the church builders and church restorers of the fifteenth and sixteenth centuries; and consequently we have here surviving till to-day, but in imminent danger of absolute destruction, a building with some of the most beautiful and most interesting specimens of the ecclesiastical architecture of the twelfth century, and some perhaps even earlier. One of the most eminent ecclesiastical architects speaks in terms of very high praise of the architectural features of the fabric, and points out that long neglect and the natural decay incidental to extreme antiquity combine to render it certain that the fabric will fall to ruin if not immediately taken in hand. The Early English arch between the chancel and the nave, which is of special architectural value, has cracked and parted by reason of the outward pressure of the roof. The committee has taken on itself the responsibility of giving orders for the immediate restoration of this arch—as also for the strengthening by temporary wooden supports of the beautiful tower, which is bulging and showing signs of falling. The area and population of the parish are both very small, and the people extremely poor. A comparatively small sum would suffice to put this little architectural gem into a condition of safety. With this end in view an account has been opened at the National Provincial Bank of England at Okehampton, and the smallest subscriptions will be thankfully received.

### EDINBURGH ARCHITECTURAL ASSOCIATION.

THE opening meeting of the forty-fifth session of the Edinburgh Architectural Association was held in the Association's rooms, 117 George Street, on the 5th inst., Mr. A. Hunter Crawford, the president, in the chair. It was resolved that a communication should be sent to the town clerk, suggesting that the architectural profession should have an opportunity of submitting designs in competition for the proposed Usher Hall. The Chairman intimated that the Association had become affiliated with the Royal Institute of British Architects. Mr. Crawford, in the course of his presidential address, said that in one branch of activity their Association was wanting—they had no work classes or studio. Since the school of applied art was begun their work classes had been discontinued, as it was felt that as long as that school provided good teaching under the immediate control of architects, that anything their Association could do would be a hindrance rather than a help. They were unanimous in acknowledging the excellence of the architectural education supplied by the school of applied art, especially in draughtsmanship and knowledge of style, and architects had seen the results in their own assistants, and the marked success of its students (out of all proportion to their numbers) were known to them all. Could they rely on this school being continued on the same lines as hitherto, with a prospect of its development to include all the teaching necessary for the full education of their students, they could wish for nothing better; but this was improbable, everything pointing to the early closing of the school, or, at any rate, its removal from the direct control of architects engaged in the daily practice of their profession. So soon as the school lost touch with practising architects they might look for a falling off in



results. There might be more passing of examinations, more leaving certificates granted, more academic teaching, but the results, so far as providing the students with ability to design and knowledge to construct, would be found to be meagre in the extreme. He asked the architects present what weight they gave to South Kensington certificates of honours in building construction when engaging an assistant? Was it not almost invariably found that knowledge acquired to pass these examinations was of little use when the student was brought face to face with a single piece of real building construction? Book learning was only an infinitesimal part of the education of an architect. It was absolutely essential, geniuses excepted, that the education should be given, or, at least, directly controlled by architects in the active practice of their profession. In his experience in this country he had not seen great results from the professional or University teaching of architecture, while everything pointed to the good that was done by teaching it in a school where practically the whole of the teaching was given by architects in active practice. In any reports he had seen regarding proposed changes in art education in Edinburgh no one had taken up a strong position in this matter, which he believed to be the most important in the whole question. It was the principle which was adopted at the inauguration of the school of applied art. On the motion of Mr. Thomas Ross, of Messrs. Macgibbon & Ross, seconded by Mr. Daniel Macfie, Mr. Crawford was cordially thanked for his address, and the proceedings terminated.

### VAUXHALL BRIDGE.

AT the meeting of the London County Council on Tuesday Sir W. Collins presented a petition from the Royal Institute of British Architects in reference to Vauxhall Bridge, expressing the earnest hope that the erection of a stone or granite bridge, as originally contemplated, might yet be found possible. The petitioners desired to impress upon the Council the vast importance of such a structure as a great architectural memorial of our time and of twentieth century art. A bridge across the Thames had an architectural value to the City hardly second to that of our great monumental buildings. The Council of the Institute had been favoured with an opportunity of inspecting the new design for the proposed steel bridge with ornamental facings and parapets in cast-iron carried by granite piers. While expressing no opinion on the engineering questions involved, the Council of the Institute felt it their duty to point out that there was a total lack of any artistic quality in the ornamental portions of the design. They remained of the opinion so often expressed by them that in dealing with great architectural monuments, which in their simplicity of form relied only upon competent artistic treatment for their monumental success, it was essential to adopt a system, common in other countries, of associating an architect with the engineer. They had no hesitation in saying that if the scheme of the pseudo-Gothic type illustrated should become a reality it would remain a discredit to the art of the century, to the London County Council and to all connected with its inception.

The petition was referred to the bridges committee.

### GENERAL.

**His Majesty** has invested Chevalier de Martino (marine painter to the King) with the insignia of the Third Class of Commander of the Royal Victorian Order.

**The South Kensington Museum** has recently received an accession to its exhibits of antique silver plate on loan from Mr. H. D. Ellis, comprising a series of fourteenth, fifteenth and sixteenth-century spoons, a series of candlesticks of the seventeenth and eighteenth centuries, especially illustrating the application of the gadroon ornamentation.

**The Woking School Board** have approved of the project of a public library for the parish.

**The Arts Club** gave a dinner on Tuesday last at the Prince's Restaurant to celebrate the Coronation knighthoods conferred on three of the members:—Sir E. A. Waterlow, Sir Isambard Owen and Sir William Emerson.

**Osborne House** has been visited by officials from the Office of Works. In order to carry out the plan of dividing a considerable portion of the building into suites of apartments for naval and military officers, their wives and families, or widows and families, extensive alterations will have to be made of the interior of the building. This will include the erection of extra staircases leading to the bedroom floor, and the Council Chamber will be divided into two.

**The Model** by Mr. John Hughes, R.H.A., has been adopted for the memorial statue of the late Queen Victoria which will be placed in Leinster Lawn, Dublin. Mr. Hughes's model represents the late Queen enthroned and surrounded by groups of symbolical figures. The materials of the memorial will be Irish limestone, bronze and statuary marble.

**Mr. A. J. Bolton**, architect, has prepared plans, which have been passed by the County Council, for a building con-

taining 270 bedrooms, a large dining-room, billiard-rooms, reading-room, library, and a large hall in the basement for gymnasium, concerts, &c. The site is at Stockwell, and a company has been formed to raise the capital of 35,000*l.* with the title Ingram Houses, Ltd.

**Mr. Carnegie** has purchased two cottages adjoining Shakespeare's house, Stratford-on-Avon, in order to minimise any risk of an outbreak of fire.

**The Voting Returns** from the joiners of the North-East circuit have been received. There was a large majority against the employers' proposals, who asked the men to resume work immediately at 1*s.* a week reduction, the other 6*d.* to be submitted to arbitration. The men had previously offered to accept 6*d.* a week reduction, which the employers refused to accept. The employers originally asked for a reduction of 1*s.* 6*d.* weekly.

**A Memorial Chapel**, to be known as the King's Own Memorial Chapel, is proposed to be erected on the north side of the Lancaster parish church at a cost of 3,000*l.*, to the memory of the officers and men of the King's Own Royal Lancaster Regiment who fell in the war. The requisite authority has been given for the vicar and churchwardens to apply for a faculty to carry out the work. Five new windows available for memorial glass will be provided.

**The New Nave of Truro Cathedral** is expected to be completed in May next, and a committee has been appointed to make arrangements for a grand formal opening. The choir and transepts were consecrated in 1887, and part of the nave has been in use for some time. The principal portion of the work yet to be accomplished is the groining of the aisle. No further cracks have appeared in the bases of the pillars nor any serious signs of settlement.

**The Association of Waterworks Engineers** will meet at the Geological Society's Rooms on December 6, when papers will be read on "The Coating of Cast-Iron Pipes," "The Softening Plant of the Stockport Corporation Waterworks" and "The Detection and Prevention of Underground Pollution."

**The Public Works Department** of the Transvaal Government in Johannesburg have secured the services of Mr. T. N. Cormack and Mr. J. L. Peddie, architects, both of whom were engaged in Messrs. Dunn & Findlay's office, Edinburgh, and held scholarships of the School of Applied Art.

**Forest Fires** in the United States are, according to a bulletin issued by the Bureau of Forestry at Washington, costly. In an average year sixty persons perish, 25,000,000*dols.* of real property is destroyed, 10,724,000 acres of timber land burned over, and young growth estimated at 75,000,000*dols.* rendered useless.

**The French Chamber** has sanctioned an agreement by which the Paris Municipality becomes owner of the site of the Gallery of Machines erected, at a cost of 7,000,000 francs, on the Champ de Mars for the Exhibition of 1889, with the right, and indeed the intention, of demolishing it or possibly of re-erecting it on another site.

**The Parliamentary Inquiry** into the applications of the Glasgow Corporation for power to purchase by agreement 50 acres of land either within or beyond the city, and to borrow 750,000*l.* for the purpose of providing houses for the poorer or labouring classes, has closed. The application was greatly opposed. The decision of the Commissioners is as follows:—"The Commission finds the preamble of the order, so far as applicable to the acquisition of additional land, not proved, but in order to enable the Corporation to complete the purposes of section 12 of the Act of 1897, the Commission is prepared to sanction additional borrowing powers not exceeding 150,000*l.*, and the imposition of such assessment as may be necessary to meet the same." Clauses were afterwards adjusted in accordance with the decision.

**The Late James Tissot**, the painter, has bequeathed to the Louvre his pictures of *The Prodigal Son*, while his engravings are to go to the National Library and to the Nantes and Besançon museums.

**The Opening Meeting** of the one hundred and forty-ninth session of the Society of Arts will be held next Wednesday evening, when an address will be delivered by Sir William Henry Preece, K.C.B., F.R.S., chairman of the Council.

**Sir Walter Armstrong**, director of the National Gallery of Ireland, will deliver the Hermione lectures in Dublin this year. The subject selected will be "Portraiture."

**Mr. James Guthrie, R.S.A.**, has been unanimously elected as president of the Royal Scottish Academy. He has been an Academician since 1892.

**The Chateau d'Eu** was the scene of a fire on Tuesday. Three of the four wings have been destroyed. It was visited by Queen Victoria in 1843 and 1845.

**A Paper** will be read by Mr. Otis D. Black before the Liverpool Architectural Society on next Monday evening. The subject is "A Holiday in Normandy."

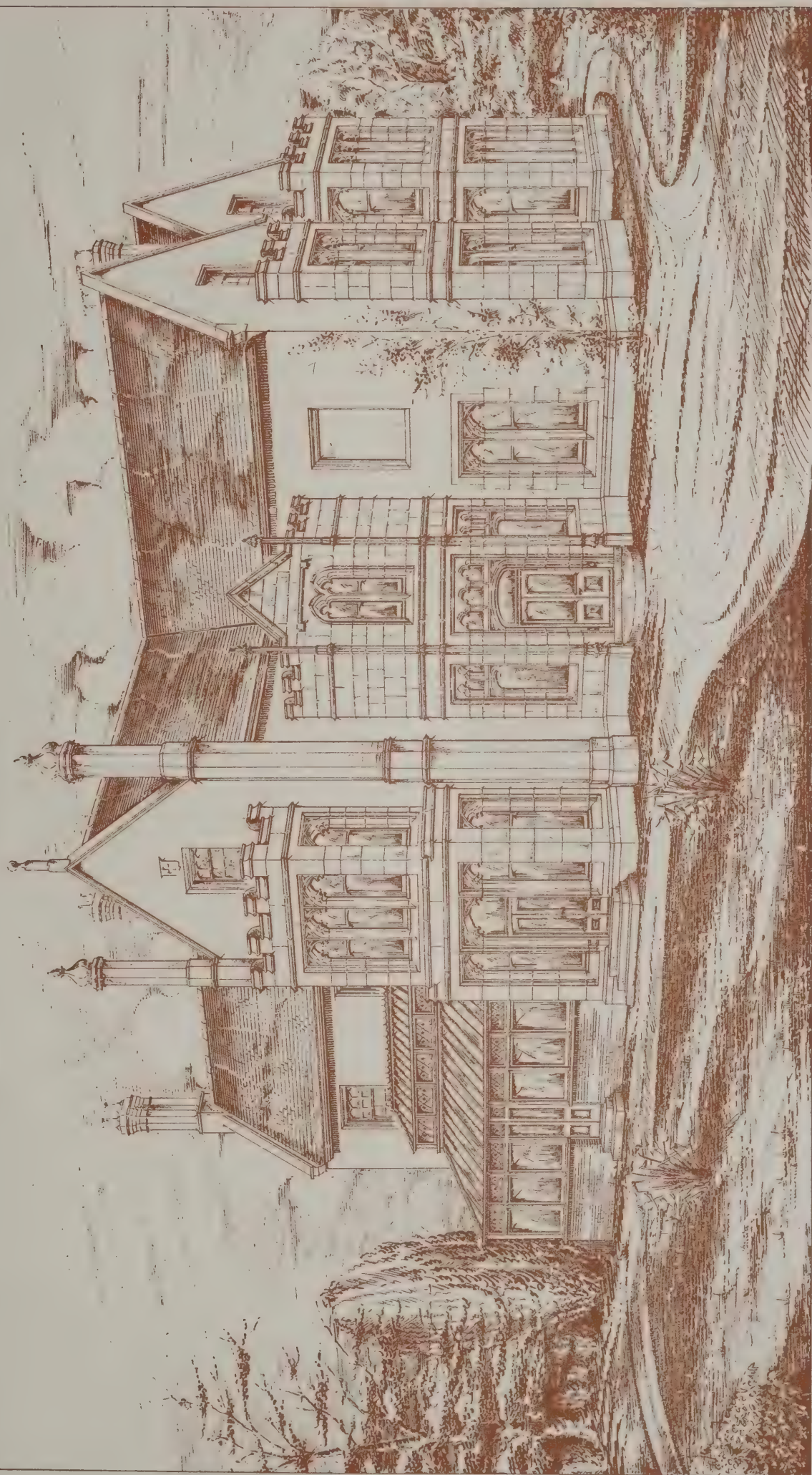


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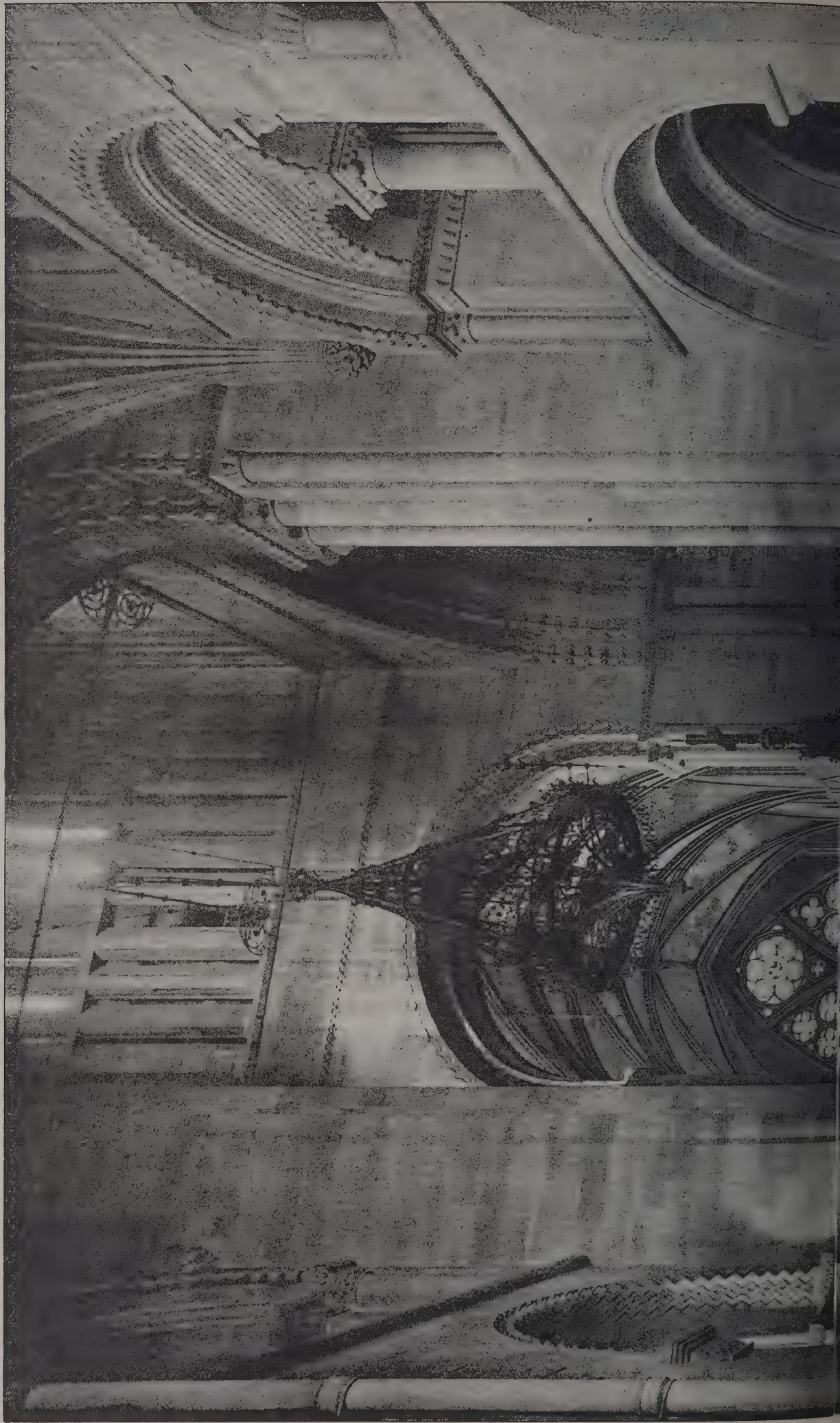
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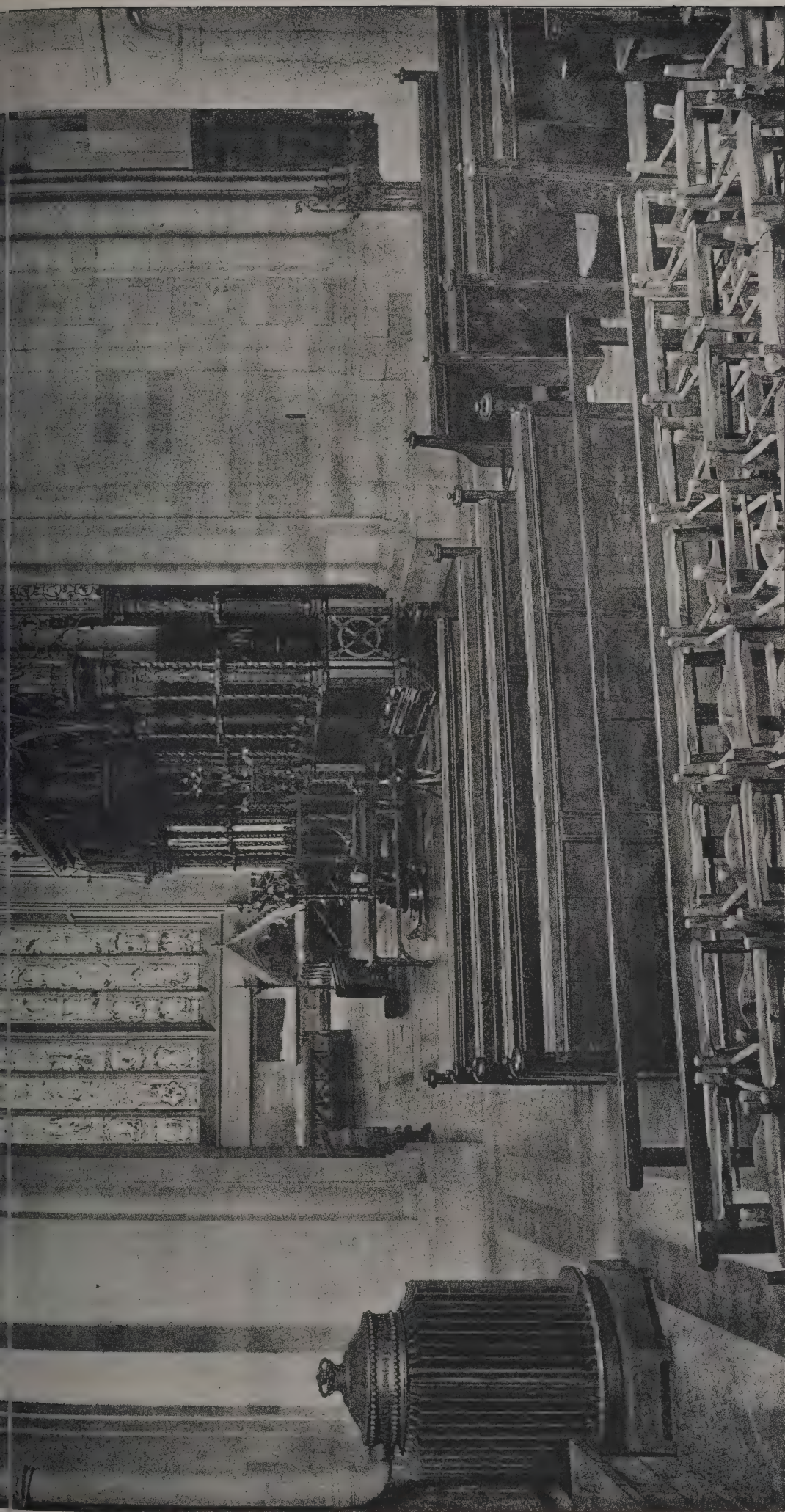
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THE

## Architect and Contract Reporter.

## EDITORIAL NOTICES.

*In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

## TENDERS, ETC.

*\*\* As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

## COMPETITIONS OPEN.

ASHTON-IN-MAKERFIELD.—Dec. 31.—Designs, &c., are invited for the enlargement of the Infectious Diseases Hospital. The architect whose plans are accepted and approved will be retained by the Council to carry out the work at the usual professional charges. Plan of the hospital site, together with full particulars of the alterations and extensions required, may be obtained from Mr. T. Burgess, surveyor, at the Council Offices.

BRIDGWATER.—Feb. 28.—Plans, specifications and estimates are invited in competition for power and appliances to deal with the accumulations of silt in portions of the river Parrett. Mr. W. T. Baker, town clerk, King Square, Bridgwater.

CAPE TOWN.—Jan. 31.—The Council of the University of the Cape of Good Hope invite designs for the erection of university buildings. Premiums of 400*l.*, 200*l.* and 100*l.* will be awarded to the authors of the designs placed first, second and third respectively. Particulars of the competition may be obtained on application to the Registrar at Cape Town, or to the Agent-General in London.

DURBAN (NATAL).—Dec. 18.—Designs are invited for new town hall, library, museum, art gallery and municipal offices. Three premiums of 500*l.*, 300*l.* and 200*l.* respectively will be awarded for the three best designs in order of merit. Mr. W. H. Radford, C.E., Albion Chambers, Nottingham.

ECCLES.—Dec. 12.—Plans are invited for the laying-out of an area of land and for erection of dwellings for the working-class on part of such area. Premiums of 50*l.*, 30*l.* and 15*l.* will be awarded in respect of the plans placed first, second and third in order of merit. Mr. Wm. Henry Hickson, town clerk, Town Hall, Eccles.

HOLYHEAD.—Dec. 2.—Sketch designs are invited for schools and a teacher's house. The competitor whose designs and terms are approved and accepted by the Board will be appointed the architect. Mr. R. E. Pritchard, clerk, Holyhead.

HULL.—Jan. 31.—Designs in competition are invited for the extension of the town hall. Premiums of 300*l.*, 200*l.* and 100*l.* are offered. Mr. E. Laverack, town clerk, Town Hall, Hull.

ILKESTON.—Nov. 28.—Competitive plans for a mixed junior school to be erected in Bennerley Street are invited. Particulars may be obtained from Mr. Wright Lissett, Town Hall, Ilkeston.

SCOTLAND.—Nov. 29.—The Arbroath Golf Club invite competitive plans for a new golf club-house at Elliot. Mr. William Alexander, secretary, 62 High Street, Arbroath.

## CONTRACTS OPEN.

AMSTERDAM.—Dec. 3.—For supply of—Contract No. 319—Corrugated and flat galvanised iron (soft steel) with appurtenances. Contract No. 70—Asphalted cast-iron pipes with appurtenances. Contract No. 71—Corrugated galvanised iron with appurtenances. Contract No. C8—Galvanised iron (soft steel). Contract No. D8—Corrugated and flat galvanised iron plating and roofing. Contract No. E8—Zincd iron wire. Contract No. F8—Soft steel. Contract No. H8—Sundry plates, discs, &c. Contract No. 18—Light rails and chairs with bolts and sleepers. Particulars may be obtained from the firm of Mart. Nyhoff at The Hague.

AUSTRALIA.—Dec. 22.—For erection at Perth, Australia, of a rubbish destructor capable of dealing with forty tons of garbage in eight hours. Mr. W. E. Bold, town clerk, Town Hall, Perth.

BATLEY.—Nov. 17.—For erection of two houses in Norfolk Street, off Dark Lane. Mr. John H. Brearley, architect, Branch Road, Batley.

BISHOP AUCKLAND.—Nov. 25.—For erection of Primitive Methodist minister's house at Coundon, near Bishop Auckland. Mr. J. Walton Taylor, architect, Newcastle-upon-Tyne.

BOOTLE.—Nov. 17.—For erection of cart-sheds, store-rooms and boundary wall at the refuse destructor, Pine Grove, Bootle, Lancs. Mr. J. Henry Farmer, town clerk.

BRADFORD.—Nov. 17.—For alterations to lavatories at Marshfield schools, and for heating and ventilating at Lorne Street school. Mr. Thomas Garbutt, clerk, School Board Office, Manor Row, Bradford.

BRADFORD.—Nov. 22.—For erection of underground convenience, steps and retaining walls at the junction of Sunbridge Road and Southgate. Mr. F. E. P. Edwards, city architect, Chapel Lane, Bradford.

BRIERLEY HILL.—Nov. 24.—For erection of technical school and free library, Brierley Hill, Staffs. Mr. J. Lewis Harpur, surveyor, Town Hall, Brierley Hill.

BRISTOL.—Nov. 19.—For erection of a group of homes with hall, &c., for the accommodation of about 200 children at Downend. Messrs. La Trobe & Western, architects, 20 Clare Street, Bristol.

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BRISTOL.—Nov. 27.—For erection of offices, &c., in Telephone Avenue, Bristol. Mr. Henry Williams, architect, Alliance Chambers, Corn Street, Bristol.

BURGESS HILL.—For erection of new classroom at London Road Girls' school, Burgess Hill, Sussex. Mr. Clayton Botham, architect, 128 Queen's Road, Brighton.

BURTON-UPON-TRENT.—Nov. 28.—For erection and equipment of an inclined retort plant and machinery at the gasworks. Mr. F. L. Ramsden, manager, Gas and Electric-light Works, Wetmore Road, Burton-upon-Trent.

CARLISLE.—Nov. 20.—For erection of the Robert Ferguson Board school, Denton Street, Carlisle, to accommodate 720 children. Mr. Walter H. Brierley, architect, Lendal, Yorks.

CLACTON-ON-SEA.—Nov. 17.—For supply of 100 tons cast-iron pipes and connections. Mr. S. Francis, District Council engineer, Town Hall.

CHELMSFORD.—Nov. 17.—For erection of cottages for scattered homes. Messrs. Chancellor & Son, architects, Chelmsford.

CONWAY.—Nov. 19.—For strengthening and widening of Conway Suspension Bridge. Mr. T. E. Parry, clerk to the Conway Bridge Commissioners, Conway.

COVENTRY.—Nov. 23.—For construction of two concrete and brick gasholder tanks at the Foleshill Gasworks. Mr. Fletcher W. Stevenson, engineer and general manager, Gasworks, Coventry.

CROYDON.—Nov. 17.—For erection of two cottages and supply and erection of about 73 yards of oak park fencing, 6 feet in height, with two gates, &c., at Beddington Corner, near Croydon. Mr. E. Mawdesley, town clerk, Town Hall, Croydon.

DARTFORD.—Nov. 18.—For additions to the West Hill Boys' School, Dartford. Mr. Henry Hall, architect, 19 Doughty Street, W.C.

DARTFORD.—Nov. 19.—For erection of a home for female attendants at the Darenth Asylum, Dartford, Kent. Messrs. Newman & Newman, architects, 31 Tooley Street, S.E.

DERBY.—Nov. 17.—For alterations and additions to the Abbey Street higher-grade Board school. Mr. F. S. Antliff, architect, Draycott, Derby.

DIDCOT.—Dec. 1.—For alterations and additions to the Board school at Didcot. Messrs. Hoare & Wheeler, architects, 17 Friar Street, Reading.

DORKING.—Nov. 18.—For laying 166 yards of 9-inch stone-ware pipes, and providing the necessary manholes and flushing tank, &c., for extension of the sewer on the Rammore Road. Mr. G. Somers Mathews, town surveyor, Council's Offices, 35 High Street.

DURHAM.—For erection of three dwelling-houses at Heighington. Mr. R. R. Kitching, architect, New Shildon.

FINCHLEY.—Dec. 1.—For fitting-up a chemical and physical laboratory, science lecture-room, preparation-room, &c., at Christ's College. Mr. E. H. Lister, clerk, Council Offices, Finchley Hall, Finchley, N.

GERMANY.—Nov. 28.—For concession of laying-down and working for fifty years a water supply for the town of Crajora. Mr. W. H. Lindley, Frankfurt-on-Maine, Germany.

GREENOCK.—Nov. 21.—For erection of a residence for the chief officer of H.M. Coastguard at the Royal Naval Reserve Battery at Greenock, N.B. The Director of Works Department, Admiralty, Avenue House, 21 Northumberland Avenue, W.C.

GREENWICH.—Nov. 18.—For supply and delivery of one 50-ton electric power overhead travelling crane, with auxiliary 20-ton hoist, and for the erection of same at the London County Council's electricity generating station. All particulars at the County Hall, Spring Gardens, London, S.W.

HALIFAX.—Nov. 19.—For alterations and additions to Trinity Road Baptist chapel. Messrs. Utley, Hebblethwaite & Utley, architects, 10 Waterhouse Street, Halifax.

HANWELL.—Nov. 24.—For alterations to the Boston Road schools, Hanwell. Mr. William Pywell, architect, Cumberland House, Hanwell, W.

HARROGATE.—Nov. 19.—For seating the new Kursaal. Mr. J. Turner Taylor, town clerk, Municipal Offices, Harrogate.

HASTINGS.—Nov. 24.—For enlargement of Hollington girls and infants' schools. Mr. C. A. Pigott, architect, Saxon Chambers, London Road, St. Leonards.

HASTINGS.—Nov. 24.—For alterations and additions to the public convenience, Rock-a-Nore Road. Mr. P. H. Palmer, borough engineer, Town Hall, Hastings.

HULL.—Nov. 19.—For alterations and additions to the Hull Paragon Street passenger station, for the North-Eastern Railway Company. Mr. William Bell, architect, York.

IRELAND.—Nov. 17.—For erection of a presbytery at Gortin. Mr. E. J. Toye, architect, Ulster Buildings, Waterloo Place, Londonderry.

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IRELAND.—Nov. 17.—For erection of 14 labourers' cottages, Monaghan. Mr. S. Mitchell, clerk to the Guardians, Clones.

IRELAND.—Nov. 17.—For erection of three two-storey cottages at Tynan station, for the Great Northern Railway Company (Ireland). Mr. T. Morrison, secretary, Amiens Street Terminus, Dublin.

IRELAND.—Nov. 17.—For erection of a new station building in timber at the Ballybeg station, for the Great Northern Railway Company (Ireland). Mr. T. Morrison, secretary, Amiens Street Terminus, Dublin.

IRELAND.—Nov. 18.—For erection of ten cottages in Windmill Lane, Drogheda. Mr. J. B. Connolly, town clerk, Town Hall, Drogheda.

IRELAND.—Nov. 21.—For erection of new buildings at Gransha for the committee of management of the Londonderry district lunatic asylum. Mr. M. A. Robinson, Richmond Street, Londonderry.

IRELAND.—Dec. 1.—For erection of a church, Aughnacloy, co. Tyrone. Messrs. Doolin, Butler & Donnelly, architects, Dawson Chambers, Dublin.

IRELAND.—Dec. 6.—For alterations to Castledawson Presbyterian church, Belfast. Mr. Thomas Houston, architect, Kingscourt, Wellington Place, Belfast.

KENDAL.—Nov. 18.—For refronting business premises, Finkle Street. Mr. Stephen Shaw, architect, Highgate, Kendal.

KENDAL.—For pulling-down portions of the walls of the new Aylwin College, Arside, rebuilding and completing the contract. Mr. John Stalker, architect, Kendal.

KINGSTON-ON-THAMES.—Nov. 17.—For supply and erection of two external iron staircases and the construction of emergency exits to the old central buildings at the workhouse. Mr. W. H. Hope, architect, Hampton Wick, Middlesex.

LEWISHAM.—Nov. 18.—For supplying iron fencing, carriage paid, to Catford railway station, South-Eastern Railway. Particulars and form of contract may be obtained at the office of the Surveyor, Town Hall, Catford.

LONDON.—Nov. 18.—For roadwork and platelaying required for the reconstruction on the conduit system for electric traction of the tramways:—(a) From the Elephant and Castle, *via* New and Old Kent Roads to East Greenwich; (b) from the Elephant and Castle, *via* Walworth Road,

Camberwell Green, Church Street, Peckham Road and Queen's Road to New Cross Gate. Particulars from the Engineer's Department, London County Council, County Hall, (Spring Gardens, London, S.W., on payment of 10% returnable).

LONDON.—Dec. 11.—For erection of the superstructure of the Victoria and Albert Museum at South Kensington, for the Commissioners of H.M. Works and Public Buildings. All information may be obtained at H.M. Office of Works, Storey's Gate, Westminster, S.W.

MANCHESTER.—Nov. 19.—For supply and erection at the Stuart Street generating station of a series of cast-iron storage tanks. Mr. F. E. Hughes, secretary, Electricity Department, Town Hall.

MANCHESTER.—Nov. 22.—For erection of eighty-two cottages on the Blackley Estate. Particulars may be obtained at the office of the City Architect, Town Hall.

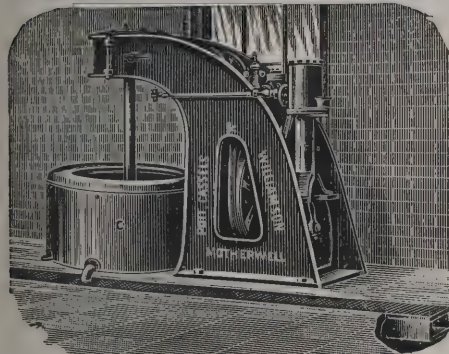
MANCHESTER.—Nov. 28.—For supply and delivery of fire-clay goods required during next season at the several gasworks. Mr. C. Nickson, superintendent, Gas Offices, Town Hall.

MANCHESTER.—Nov. 29.—For erection of a cast-iron ammonia water storage tank and work in connection therewith. Mr. C. Nickson, superintendent, Gas Department, Town Hall.

MIDDLESBROUGH.—Nov. 17.—For erection of two waid pavilion blocks, entrance lodge, &c., at the sanatorium, West Lane, Middlesbrough. Mr. Frank Baker, borough engineer, Municipal Buildings, Middlesbrough.

MONTE VIDEO.—Dec. 15.—For the sanitary works to be carried out in Monte Video harbour. Works offered for tender include the following:—(a) A rock tunnel, 1,278 metres in length, 3m. 65 in height, and 3m. in width; (b) a main collector, 1,557 metres 60 by 1,283m. 30 in length, oval profiles 1.80m. and 1m. 70 in height respectively; (c) a secondary collector 2,016m. in length, varying its oval profiles from 1.70m, 1m. 25, and 0m. 98 in height; (d) the auxiliary collectors, affluents, &c. Plans, estimates and general conditions can be had in Monte Video by applying to the "Ministerio de Fomento," and through the respective Legations in Europe. Tenders made in Europe through the Legations in the above-mentioned countries should be handed to the said Legations at least one month before the mentioned date. Plans, &c., may be seen at the offices of the Consulate-General of Uruguay, Edinburgh Mansions, Howick Place, Victoria Street, S.W.

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**NORTH SHIELDS.**—Nov. 27.—For extension of the Queen Victoria Schools, Coach Lane, North Shields. Messrs. Marshall & Tweedy, architects, 17 Eldon Square, Newcastle-on-Tyne.

**NOTTINGHAM.**—Nov. 20.—For erection of station buildings, &c., at Nottingham, for the Midland Railway Company. Particulars may be obtained on application at the Engineer's Office, Derby station.

**PADDINGTON.**—For alterations at the workhouse in the Harrow Road. Mr. F. J. Smith, architect, Parliament Mansions, Victoria Street, S.W.

**PADDINGTON.**—Nov. 17.—For construction of a convenience at the Paddington Recreation Ground, Portsdown Road. Mr. E. B. Newton, borough surveyor, Town Hall, Paddington, W.

**PORTLAND.**—Nov. 21.—For erection of new coastguard buildings, consisting of quarters for four men, at Grove Point, Portland, Dorset. Particulars may be seen at the Superintending Civil Engineer's Office, H.M. Breakwater, Portland.

**ST. ALBANS.**—Nov. 24.—For erection of a pavilion in the Clarence Park recreation ground. Mr. A. H. Debenham, town clerk, St. Albans.

**SCOTLAND.**—Nov. 17.—For additions to Marischal College, facing Broad Street, Aberdeen. Mr. A. Marshall Mackenzie, architect, 343 Union Street.

**SCOTLAND.**—Nov. 22.—For erection of a public school at Lochwinnoch, to accommodate over 600 scholars. Mr. C. Davidson, architect, Terrace Buildings, Paisley.

**SCOTLAND.**—Nov. 22.—For additions and alterations at the Commercial hotel, Forres. Mr. John Forrest, architect, Forres.

**SCOTLAND.**—Nov. 25.—For constructing a store reservoir on the Caee Water, and accompanying works, about three miles from Dalry railway station, Ayrshire. Messrs. J. & A. Leslie & Reid, engineers, 72A George Street, Edinburgh.

**SHEFFIELD.**—Nov. 18.—For erection of a shed for the storage of lime, &c., at the Lumley Street destructor. Mr. Charles F. Wike, C.E., city surveyor, Town Hall, Sheffield.

**STOCKTON-ON-TEES.**—Nov. 17.—For construction of a new bridge over Billingham Beck and the widening of a bridge over Lustring Beck, and for the construction of a new road between Portrack Lane and Billingham Beck. Mr. M. H. Sykes, borough engineer, Stockton-on-Tees.

**SUNDERLAND.**—Nov. 28.—For supply of one steam-driven three-phase generator, motor generators and static transformers and high and low tension switchboards. Mr. J. F. C. Snell, electrical engineer, Town Hall, Sunderland.

**SWINDON.**—Nov. 18.—For erection of Jenning Street Board school, Swindon. Messrs. Bishop & Pritchett, architects, Swindon.

**TAVISTOCK.**—Nov. 25.—For rebuilding the Manor House at Warne farm, Marytavy, Tavistock. Mr. Horace W. Collins, architect, Redruth.

**TRURO.**—Nov. 17.—For altering premises at rear of market hall, Truro, to form fire-engine stations, conveniences, &c. Mr. Measham Lea, city surveyor, Truro.

**WALES.**—For erection of new English Wesleyan church at Llangollen. Messrs. W. J. Morley & Sons, architects, 269 Swan Arcade, Bradford.

**WALES.**—Nov. 18.—For erection of an out-patients' department at the Swansea General and Eye hospital. Mr. Glendinning Moxham, architect, Castle Street, Swansea.

**WALES.**—Nov. 21.—For extension and enlargement of the Pwll school, Llanelly. Mr. Richard Williams, architect, Burry Port.

**WALES.**—Nov. 22.—For alterations and additions to Bank House, Carmarthen. Mr. Daniel Phillips, surveyor, Carmarthen.

**WALES.**—Nov. 22.—For erection of a laundry building at Llwynpia, Pontypridd. Mr. A. O. Evans, architect, Pontypridd.

**WALES.**—Nov. 22.—For erection of buildings for the generating station, offices and car-sheds at Pontypridd. Mr. Reginald P. Wilson, 66 Victoria Street, Westminster.

**WALES.**—Nov. 26.—For erection of the Hafod school, Swansea. Mr. G. E. T. Laurence, architect, Chandos Chambers, Buckingham Street, Adelphi, W.C.

**WANDSWORTH.**—Dec. 1.—For erection of buildings and other works at Waterside Wharf, Jews Row. Particulars may be obtained at the Surveyor's Office, 215 Balham High Road, S.W.

**WALSALL.**—Dec. 6.—For erection of a junior mixed department and enlargement of the present buildings at Palfrey school, Walsall. Messrs. Bailey & McConnal, architects, Bridge Street, Walsall.

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WEALDSTONE.—Nov. 18.—For street works in Hindes Road. Mr. F. Hill Parr, surveyor, Council Offices, Wealdstone, Middlesex.

WEST HAM.—Nov. 25.—For street works in Glasgow Road, Tweedmouth Road, Stirling Road, Dundee Road, Edinburgh Road, Southern Road (part). Mr. John G. Morley, borough engineer, Town Hall.

WEST HARTLEPOOL.—Nov. 19.—For supply of kerbstone, flags, paving settle, road stone, pitch and tar, lime, sewer pipes, metal castings, cement, disinfectants, picks and shovels, scythes, brushes, oils, firewood, sawdust, general stores, &c. Mr. Brown, borough engineer, Corporation Depot, Stranton.

### MANCHESTER ELECTRICAL ENGINEERS.

A MEETING of the Manchester section of the Institution of Electrical Engineers was held on Tuesday evening at the physical laboratory of the Owens College. Mr. E. W. Cowan, vice-president, was in the chair, and Mr. W. Francis Goodrich, of London, read a paper on "Electricity from Refuse: The Case for the Modern Destructor." The object of the paper was to show that cremation of refuse and really efficient power production were compatible and could be coincident. Out of a total number of 165 towns in Great Britain where destructors had been adopted, said the lecturer, 45 towns had decided to combine the destructor with the electricity works; and the actual destroying capacity of the destructors adopted in combination with generating stations might be put at upwards of 1,400 tons daily. Forty and even 50 units had been generated per ton of refuse destroyed over short periods. At Darwen, over a period of a year, 33 units had been generated per ton of refuse destroyed, and at Shoreditch, over a similar period, 20 units. Sufficient data was available to show that, with a well-designed and well-managed plant, at least 30 units per ton of refuse burned might safely be relied upon the whole year through. There had been a number of instances where for a certain period the whole of the power required had been obtained from the refuse, but this happy state of things was exceptional, and experience showed that the refuse-destructor was but a most useful adjunct to a generating station. Mr. Goodrich, who showed a number of lantern-slides in connection with his lecture, was warmly thanked at the close.

## TENDERS.

### BILDESTON.

For erection of a classroom to the Nedging and Naughton Board school (U.D.).  
J. H. Castle . . . . . £180 0 0  
J. DEATH & SON, Bildeston, Ipswich (accepted) 149 0 0

### BLACKWELL.

For construction and laying-out of outfall works and construction of a 15-inch cast-iron hydraulic sewer, &c. Mr. HENRY SILCOCK, engineer, 34B West Gate, Mansfield.  
Saunders . . . . . £4,538 0 0  
W. Theaker . . . . . 3,398 0 0  
Lane Bros. . . . . 2,776 0 0  
H. ASHLEY, Mansfield (accepted) . . . . . 2,699 0 0

### BRADFORD.

For paving a road for the Bower Green Combing Company, Bradford.  
J. WHEATER, Leeds Road, 7s. 3d. per super yard (accepted).

### BREDBURY.

For sewerage of Bredbury Green. Mr. WILLIAM SPINKS, engineer, 20 Park Row, Leeds.  
T. RHODES, Higher Bent's Lane, Bredbury (accepted) . . . . . £1,196 8 8

### BRIDLINGTON.

For erection of a small villa residence in Belgrave Road. Mr. SAMUEL DYER, architect, 29 Quay Road, Bridlington.  
Smallwood & Shaw . . . . . £672 0 0  
A. Gardam . . . . . 660 0 6  
A. Wills . . . . . 653 0 0  
A. A. Booth . . . . . 645 0 0  
E. E. Yeomans . . . . . 644 10 0  
F. Kneeshaw . . . . . 639 0 0  
F. Flintoft . . . . . 630 0 0  
W. Barnes . . . . . 628 19 0  
T. Spink . . . . . 600 0 0  
E. Corner . . . . . 560 0 0  
F. POSTELL, Bridlington (accepted) . . . . . 494 0 0

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**BURNLEY.**

For sewerageworks in the township of Huncoat, laying-out outfall works, including the construction and completion of settling tanks, bacterial filters, roughing filter, under-drains, storehouse, &c. Mr. S. EDMONDSON, surveyor.

*Accepted tenders.*

Clegg Bros., Burnley, outfall works . . . £3,195 0 0  
J. & G. Duxbury, Padiham, sewers and manholes 1,681 0 0  
Note—There were forty-eight tenders received.

**CLACTON-ON-SEA.**

For supply of about 100 tons of cast-iron pipes and connections. Mr. SYDNEY FRANCIS, engineer, Town Hall, Clacton-on-Sea.

F. W. LEWELLEN & CO, Clacton-on-Sea, 3-inch pipes, £5 13s. per ton; 4-inch, £5 8s.; specials, £9 15s. (*accepted*).

**DEVON.**

For sewerage works for the Plympton St. Mary Rural District Council. Mr. R. HANSFORD WORTH, engineer, 42 George Street, Plymouth.

J. Crockerell . . . . .	£8,300	0	0
W. C. Shaddock . . . . .	8,281	4	8
R. H. B. Neal . . . . .	7,780	10	0
J. Shaddock . . . . .	7,509	8	0
S. Roberts . . . . .	7,157	19	1
A. N. Coles . . . . .	6,951	0	0
J. C. Lang . . . . .	6,907	0	4
Hooper Bros. . . . .	6,156	15	4
J. Binns . . . . .	6,035	1	5
A. J. Richards . . . . .	5,720	0	0
J. Fisher . . . . .	5,518	11	8
J. DAVY, Plymouth ( <i>accepted</i> ) . . . . .	5,810	0	0

**HEMEL HEMPSTEAD.**

For street works in Astley Road. Mr. WALTER R. LOCKE, borough surveyor.

H. BROWN, Watford (*accepted*) . . . . . £375 0 0

**HAMMERSMITH.**

For maintaining the burners, mantles, chimneys, globes, forks and reflectors of the incandescent gas lamps in the borough.

W. EAGAR, Blenheim House, Lower Mall, Hammersmith, W., 12s. 3d. per lamp per annum (*accepted*).

**HAMMERSMITH—continued.**

For supply and fixing of a special transformer to enable a supply to be given to the King's Theatre, Hammersmith Road.

Lancashire Electric Motor Company ( <i>alternative</i> ) . . . . .	£329	0	0
E. Scott & Mountain . . . . .	268	0	0
Lancashire Electric Motor Company . . . . .	267	0	0
Geipel & Lange ( <i>alternative</i> ) . . . . .	260	0	0
Johnson & Phillips . . . . .	260	0	0
Laurence, Scott & Co. . . . .	255	0	0
Geipel & Lange . . . . .	252	0	0
Electric Construction Company . . . . .	251	0	0
General Electric Company . . . . .	244	0	0
Bruce & Co. . . . .	243	0	0
F. A. Glover & Co. . . . .	235	7	0
Fuller Electrical Manufacturing Company . . . . .	225	0	0
R. Jackson & Co. . . . .	220	0	0
Witting Bros. . . . .	217	0	0

**IRELAND.**

For heating new home for nurses at the Belfast Union Work-house.

R. DAWSON & CO, LTD, Stalybridge (*accepted*) £460 0 0

For supply to the Londonderry Corporation of granite for street purposes.

G. A. Watson & Co. . . . .	£156	5	0
A. Stow & Sons . . . . .	152	0	0
W. Wilson . . . . .	140	0	0
J. McNEILL, Donegal Street, Belfast ( <i>accepted</i> ) . . . . .	119	1	5
Ulster Marble and Stone Works . . . . .	117	10	0
J. Gordon & Sons . . . . .	112	10	0
King & Co. . . . .	62	5	0

**LEEDS.**

For erection of 16 houses at Holbeck. Mr. FRED. W. RHODES, architect, Upper Wortley, Leeds.

G. SMITH, Armley, bricklayer and mason labour (*accepted*).

For erection of warehouse at Armley for Messrs. H. Hartley & Co. Mr. FREDK. W. RHODES, architect, Upper Wortley Road, Leeds.

*Accepted tenders.*

S. Ormerod, Bramley, bricklayer and mason.  
J. Walker, Armley, joiner.

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LEYTON.

For paving at the Farmer Road schools, Leyton, Essex, in course of erection. Mr. WILLIAM JACQUES, architect, 2 Fen Court, Fenchurch Street, E.C.

J. Hancock	£99 16 5
Victoria Stone Co.	97 10 0
Imperial Stone Co.	90 7 4
Impervious Stone Co.	84 2 6
Hobman & Co.	79 7 9
M. McLEOD & Co. (accepted)	76 18 5

For electric lighting at Farmer Road schools, Leyton, Essex. Mr. W. JACQUES, architect, 2 Fen Court, E.C.

Allam & Co.	£1,054 15 0
Wenham & Waters	872 0 0
W. Simmons	820 0 0
J. C. Christie	754 3 0
H. Barlow	751 0 0
E. Ryan & Co.	683 1 0
W. R. WOODWARD (accepted)	675 5 0

LONDON.

For heating the Bermondsey town hall and offices on the low-pressure system. Mr. R. J. ANGEL, borough surveyor.

Clement, Jeakes & Co.	£1,912 0 0
W. G. Cannon & Sons	1,795 0 0
Brightside Foundry and Engineering Co., Ltd.	1,784 0 0
W. Baily & Sons	1,771 10 6
J. Simpson & Co., Ltd.	1,755 0 0
C. G. Reed & Sons, Ltd.	1,740 0 0
C. Kite & Co.	1,625 0 0
Palowkar & Sons	1,530 0 0
J. F. May	1,495 0 0
J. Jones & Son	1,450 0 0
A. Dawson & Co., Ltd.	1,445 0 0
W. H. Tilley	1,395 0 0
H. F. Joel & Co. and T. Potter & Sons, United, Ltd.	1,375 0 0
J. Biggs	1,371 0 0
Mather & Platt, Ltd.	1,250 0 0
A. Macintosh & Sons, Ltd.	1,146 0 0
Werner, Pfeiderer & Perkins, Ltd., 43 Regent Square, W.C.*	1,120 10 0

\* Recommended for acceptance.

LONDON SCHOOL BOARD.

For removing existing partition and providing two sliding glazed partitions in order to redivide classrooms B and C into three rooms, including the provision of a lobby in the middle room for direct access to one of the side rooms; also providing an open-fire portable stove for warming the middle room in each case and constructing brick flues in connection with same, together with lengthening the windows in the same room, Gillespie Road school (boys and girls), Finsbury.

C. Dearing & Son	£560 0 0
Thompson & Beveridge	518 0 0
London School Furniture Co.	495 0 0
Wake & Dean, Ltd.	440 0 0
W. Martin	438 0 0
McCormick & Sons	434 0 0
F. Bull*	367 0 0

For dividing off portion of playground and erecting offices for the use of the girls attending the special school; also providing the necessary drainage and connecting it to an existing chamber, Smith Street school, Tower Hamlets.

J. Shelley	£364 5 0
Johnson & Co.	296 0 0
G. Parker	289 0 0
J. Peattie	288 0 0
F. & F. J. Wood	275 0 0
Vigor & Co.	257 0 0
F. Bull	251 0 0
A. W. Derby*	245 0 0

For rebuilding offices, all departments; providing additional offices for girls' playground; refitting offices on roof playground; hacking up tar-paving, rearranging levels and falls and repaving, and providing part new drainage scheme, Berger Road school, Hackney.

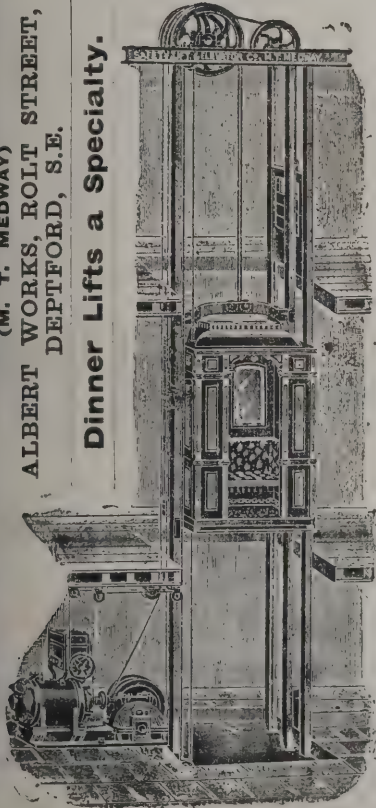
J. Willmott & Sons	£2,429 0 0
G. Neal	2,376 10 0
Stevens Bros.	2,246 0 0
G. S. S. Williams & Son	2,231 0 0
R. P. Beattie	2,163 13 11
Johnson & Co.	2,151 10 0
J. Peattie	2,120 6 8
Durbin & Katesmark	2,108 0 0
F. Bull*	2,093 0 0

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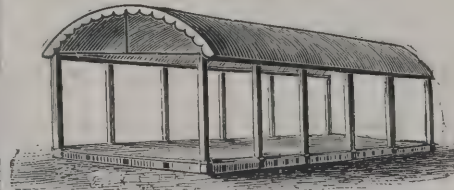
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For accommodation—boys and girls, 584; infants, 388; total, 972, Telferscot Road school, West Lambeth.

Lathey Bros. . . . .	£25,435	0	0
F. & H. F. Higgs . . . . .	24,986	0	0
Martin, Wells & Co., Ltd. . . . .	24,772	0	0
Holloway Bros., Ltd. . . . .	23,478	0	0
J. Simpson & Son . . . . .	23,149	0	0
J. Garrett & Son . . . . .	22,753	0	0
E. Lawrance & Sons . . . . .	22,593	0	0
W. H. Lorden & Son . . . . .	22,475	0	0
Spencer, Santo & Co., Ltd. . . . .	22,170	0	0
C. Cox . . . . .	22,127	0	0
W. King & Son . . . . .	22,115	0	0
Holliday & Greenwood, Ltd. . . . .	21,977	0	0
W. Downs . . . . .	21,974	0	0
F. Gough & Co. . . . .	21,934	0	0
Stimpson & Co. . . . .	21,460	0	0
J. Carmichael . . . . .	20,941	0	0
J. & M. Patrick . . . . .	20,699	0	0
W. Johnson & Co., Ltd.* . . . . .	20,578	0	0

For enlargement—boys and girls, 160, on arches; providing room for practical science, 472 feet area; demonstration-room, 368 feet area; balance-room, &c. and housewifery centre, West Square school, Southwark.

Martin, Wells & Co., Ltd. . . . .	£6,808	0	0
W. Smith & Son . . . . .	6,268	0	0
T. L. Green . . . . .	6,238	0	0
W. Johnson & Co., Ltd. . . . .	6,180	0	0
F. & H. F. Higgs . . . . .	5,817	0	0
J. Greenwood . . . . .	5,778	0	0
J. Appleby . . . . .	5,739	0	0
W. Downs . . . . .	5,639	0	0
E. P. Bulled & Co. . . . .	5,637	0	0
Rice & Son . . . . .	5,593	0	0
T. D. Leng . . . . .	5,579	0	0
Johnson & Co. . . . .	5,578	0	0
J. Garrett & Son . . . . .	5,518	0	0
J. Marsland & Sons . . . . .	5,444	0	0
General Builders, Ltd. . . . .	5,395	0	0
E. Triggs * . . . .	5,266	0	0

\* Recommended for acceptance.

## LONDON SCHOOL BOARD—continued.

For providing sliding glazed partition to divide classroom B in each department, Rotherfield Street school, Finsbury.

C. Dearing & Son . . . . .	£281	0	0
H. Bouneau . . . . .	255	0	0
London School Furniture Co. . . . .	237	14	9
Barrett & Power . . . . .	228	0	0
McCormick & Sons . . . . .	222	0	0
G. S. S. Williams & Son * . . . .	206	0	0

For enlargement—boys, 116; girls, 116; infants, 128; total, 360, Ivydale Road school, East Lambeth.

W. Downs . . . . .	£8,105	0	0
F. & H. F. Higgs . . . . .	7,892	0	0
Martin, Wells & Co., Ltd. . . . .	7,794	0	0
W. J. Mitchell & Son . . . . .	7,687	0	0
J. Greenwood . . . . .	7,635	0	0
Holloway Bros., Ltd. . . . .	7,518	0	0
Rice & Son . . . . .	7,445	0	0
Lathey Bros. . . . .	7,197	0	0
Holliday & Greenwood, Ltd. . . . .	7,179	0	0
E. Lawrance & Sons . . . . .	7,105	0	0
E. Triggs . . . . .	7,073	0	0
J. Smith & Sons, Ltd. . . . .	6,991	0	0
J. & C. Bowyer * . . . .	6,696	0	0

For providing and fixing complete low-pressure hot-water apparatus to three halls (boys, girls, infants), also to six classrooms on each floor, drawing classroom, cloak-rooms, corridors and lavatories, Kilmore Road school, Greenwich.

Paragon Heating Co. . . . .	£785	0	0
J. Wontner-Smith, Gray & Co. . . . .	710	0	0
W. G. Cannon & Sons . . . . .	699	0	0
Stevens & Sons . . . . .	660	0	0
J. & F. May . . . . .	588	0	0
R. Clarke . . . . .	574	0	0
Bates & Son . . . . .	509	0	0
G. & E. Bradley . . . . .	481	0	0
The Brightside Foundry and Engineering Co., Ltd. . . . .	464	0	0
M. Duffield & Sons * . . . .	427	0	0

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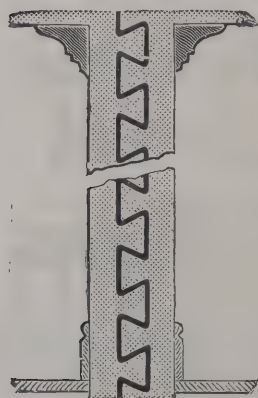
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Accepted tenders.

H. & T. Danks, boilers.

Glover, cables.

Dick, Kerr & Co., transformers, alternators, engines, &c.

NORTON-UNDER-CANNOCK.

For supply of fittings, &c., to the Walsall Wood new school, Norton-under-Cannock.

Accepted tenders.

Fisher, Son & Weaver, desks and fittings . . . £136 12 0  
Chesterton, gas fittings . . . . . 38 10 0

RAMSBOTTOM.

For reconstruction of the existing tanks, sludge filters, &c., at Summerseat, near Ramsbottom, Lancs. Mr. JAMES DIGGLE, engineer, Hind Hill Street, Heywood.  
PLATT & CASTLE, Ramsbottom, near Manchester (accepted) . . . . . £9,948 0 0

SCOTLAND.

For construction of footway and macadamising on south side of Port Glasgow Road, Greenock.  
O. Mitchell . . . . . £1,898 6 2  
R. Aitkenhead & Sons . . . . . 1,275 9 8  
A. A. R. LANG, Gourrock (accepted) . . . . . 1,212 17 8

STRATFORD.

For erection of depository at Stratford, for Messrs. C. Boardman & Sons. Messrs. GEORGE BAINES & R. PALMER BAINES, architects, 5 Clement's Inn, Strand, London, W.C.  
Estimate A. Estimate B.  
G. F. Hosking . . . . . £3,925 0 0 £22 10 0  
W. Johnson & Co. . . . . 3,900 0 0 21 0 0  
Mattock Bros. . . . . 3,797 0 0 36 0 0  
Battley, Sons & Holness . . . . . 3,729 0 0 20 0 0  
Turtle & Appleton . . . . . 3,635 0 0 19 0 0  
F. & H. F. Higgs . . . . . 3,609 0 0 23 0 0  
F. Gough & Co. . . . . 3,374 0 0 20 0 0  
C. NORTH, Stratford (accepted) . . . . . 3,164 0 0 30 0 0

SHIREBROOK.

For carrying-out the completion of the sewage scheme at Shirebrook.

S. Saunders . . . . . £4,538 0 0  
W. Theaker . . . . . 3,398 0 0  
Lane Bros. . . . . 2,776 11 0  
H. ASHLEY, Mansfield (accepted) . . . . . 2,699 0 0

SKIPTON.

For erection of sanatorium for consumptives at Eastby, near Skipton. Mr. FRED. HOLLAND, architect, 11 Parkinson's Chambers, Hustlergate, Bradford.

Accepted tenders.

E. Balmforth, Queensbury, mason . . . £1,192 10 0  
A. H. Shaw, Skipton, carpenter and joiner . . . 522 6 10  
W. & J. Harrison, Keighley, plumber . . . 247 0 0  
J. Greenwood, Cross Hills, plasterer . . . 112 0 4  
R. Thornton & Son, Skipton, slater . . . 89 15 0  
E. Harland & Sons, Bradford, painter . . . 41 0 0

WALES.

For rebuilding business premises and offices at 6 and 7 St. John's Square, Cardiff. Mr. E. H. BRUTON, architect, 119 Queen Street, Cardiff.

Nash & Nash . . . . . £5,203 15 7  
Gough Bros. . . . . 4,950 0 0  
Couzens & Co. . . . . 4,925 0 0  
Knox & Wells . . . . . 4,784 10 0  
G. Shepton . . . . . 4,750 16 0  
Parnall, Weston . . . . . 4,747 0 0  
Beames & Nepean . . . . . 4,700 0 0  
G. Griffith . . . . . 4,650 0 0  
D. W. Davies . . . . . 4,550 0 0  
G. Hallett . . . . . 4,550 0 0  
Symonds & Co. . . . . 4,400 0 0  
E. R. Evans Bros. . . . . 4,320 0 0  
Cadwallader . . . . . 4,300 0 0  
E. Turner & Sons . . . . . 4,250 0 0  
Price Bros. . . . . 4,200 0 0  
W. Thomas & Co. . . . . 4,189 0 0  
J. ALLAN & SON, Cardiff (accepted) . . . . . 4,110 0 0

For supply of iron castings, Merthyr Tydfil. Mr. T. F. HARVEY, surveyor.  
J. ENGLAND & SON, Penyardren Foundry, Merthyr (accepted).

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## WALES—continued.

For erection of premises in Tunnel Court, Cardiff. Mr. EDGAR

G. C. DOWN, architect, 31 High Street, Cardiff.

Lathey & Co., Ltd.	£657	3	0
W. T. Morgan	590	0	0
D. W. Davies	590	0	0
J. Allan	570	0	0
Price Bros.	568	0	0
E. Turner & Sons	567	0	0
W. Thomas & Co.	555	0	0
G. Griffith	550	0	0
Knox & Wells	515	0	0
W. SYMONDS & Co., Rectory Road (accepted)	500	0	0

For construction of public road on Gwernyfed Estate, near Glasbury Station, Glasbury, Brecon, about 800 yards long.

R. W. HUNTER, Clive Chambers, Windsor Place, Cardiff (accepted) . £481 1 6

## WILLENHALL.

For street works.

Accepted tenders.

Rose Hill.

Trentham . . . £300 0 0

Wood Street.

Trentham . . . 100 0 0

## WROTHAM.

For erection of house and stable at Hognore Hill, Wrotham, Kent, for Mr. Charles Garton. Mr. EDWARD TIDMAN, architect, 34 Victoria Street, Westminster. Quantities by Messrs. J. LEE &amp; SONS, 35 Craven Street, Strand.

	House.	Stable..
W. H. Archer, Gravesend .	£2,898 0 0	£325 0 0
Elmore & Sons, Maidstone .	2,880 0 0	320 0 0
Corben, Sevenoaks . . .	2,830 0 0	233 0 0
Banks, Denton Green . . .	2,761 10 0	243 10 0
Emmett, Maidstone . . .	2,595 0 0	309 0 0
Wiltshire, Sevenoaks . . .	2,526 0 0	293 0 0
Iggulden, Wrotham . . .	2,508 14 0	346 0 0
Kimpton & Ranger, Ealing .	2,294 7 0	302 2 0
Wood, Maidstone . . .	2,075 5 0	335 0 0
WOOD & SONS, Boughton, Mon-chelsea, Maidstone (on modified plan and accepted) .	1,900 0 0	210 0 0

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## CONTRACTS OPEN.

Received too late for Classification.

BLACKBURN.—Nov. 24.—For supply of two boilers, mechanical stokers and fittings, six superheaters, one battery economiser, two feed pumps, pipes, tanks and accessories, three ejector condensers, steam and exhaust pipes, condenser pipes, tanks, valves and accessories, ash and coal conveying and elevating plant. Messrs. Lacey, Clirehugh & Sillar, engineers, 2 Queen Anne's Gate, Westminster.

FINCHLEY.—Nov. 24.—For supply and erection of three water-tube boilers, two steam balancing sets, spare armature and travelling crane, two storage batteries and accessories, feeders, distributing mains, service cable, street lighting, leads, &c. Mr. E. Calvert, electrical engineer, Broadway, Finchley.

NEWCASTLE-ON-TYNE.—Nov. 29.—For supply of furniture, ironmongery and stable requisites for the new East End police-station. Particulars on application to the Chief Constable's office, Pilgrim Street.

PENRITH.—Nov. 17.—For erection of a reservoir, providing and laying about 1,933 yards of 3-inch cast-iron water mains, with all valves, hydrants, fittings, &c. Particulars obtainable at the Engineer's office.

WALES.—Nov. 27.—For renewals and repairs to the Cogan pumping-station's engines and boilers, Cardiff. Mr. C. H. Priestley, waterworks engineer, Town Hall.

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# NEW CATALOGUE.

WE have received from Messrs. Alfred Walker & Son, of 7 Upper James Street, Golden Square, W., and Leeds, a catalogue setting forth particulars of their Granitic-stone pavements, concrete steps and landings, fireproof floors, &c., and containing also a list of contracts they have carried out in various parts of the country, which, while not a complete one, is certainly imposing, and represents an enormous amount of work satisfactorily executed, as may be gathered from the fact that in all cases the architects have given permission for their names to be used as references.

The work done may be divided into different sections:

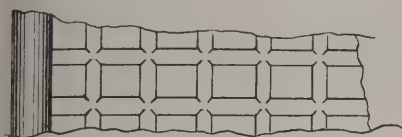


FIG. 1.

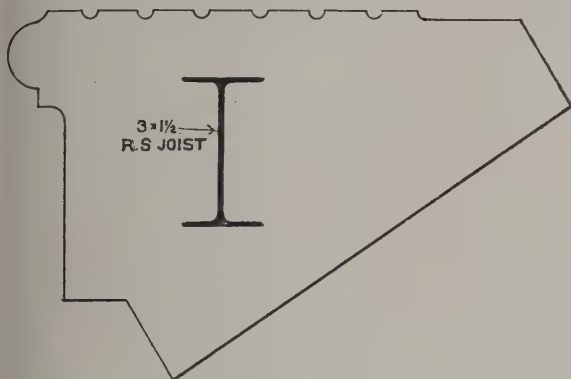


FIG. 2.

Firstly, pavings, playgrounds, carriage drives, stable floors, &c.; secondly, fireproof floors, staircases and corridors and the fireproofing of girders, beams and columns; and thirdly, plain and moulded window sills and heads, copings, plain and moulded steps, sinks, &c. Among the more important contracts carried out by Messrs. Walker & Son we may mention that of

the pavings and staircases erected at the new buildings of the Prudential Assurance Company, Holborn Bars, Messrs. Alfred Waterhouse & Son, architects, the concrete steps being made with their patent tread, which we illustrate, fig. 1 being a part plan and fig. 2 the section. This is a very useful, clean tread, made in casting the step; it affords a better foothold and improves the appearance, taking away the plainness of the steps, and may be recommended for use in all staircases. It has been adopted for various branch buildings of the Prudential Assurance Company at Bristol, Plymouth, Hull, &c.; also at the London Hospital, new hospital Maida Vale, Enmore Castle, Messrs. Peter Robinson's premises, and many other places. Where specially ordered, however, the concrete steps are fitted with wood, rubber, or mosaic treads. Other work in hand or recently completed by this firm comprises steps (over 1,100), landings and pavings for Leeds Central Estate Buildings; fireproof floors and pavings for Yorkshire College and the new Leeds Markets; Empire Palace, Leicester; Empire Hotel, Buxton; St Paul's Schools, Hammersmith; at the nurses' home and new cancer wing, Middlesex Hospital; and fireproof staircases at the London Hospital, Whitechapel (outpatients' department).

For the Liverpool School Board they have supplied over 40,000 superficial yards of paving to playgrounds, about 35,000 superficial yards for the Leeds School Board, and over 15,000 superficial yards paving at Hôtel Majestic, Harrogate.

Pavements have been laid in London for the Marylebone Board of Works, and for the Corporations of Leicester, Birmingham, Liverpool, Oldham, Newark, Dublin, Drogheda, &c.

Among the work executed for stable paving we notice that Messrs. Walker & Son have laid at Curragh Camp, Ireland, for the War Department over 20,000 yards, in addition to that at Norwich, Ipswich, and Colchester, and for the Midland and other railway companies in various towns.

We have said sufficient to show the extent of the operations of this firm, which has been established since 1861, and the reputation they have maintained throughout that long period is sufficient guarantee that all work undertaken by them will be carried through in a satisfactory manner.

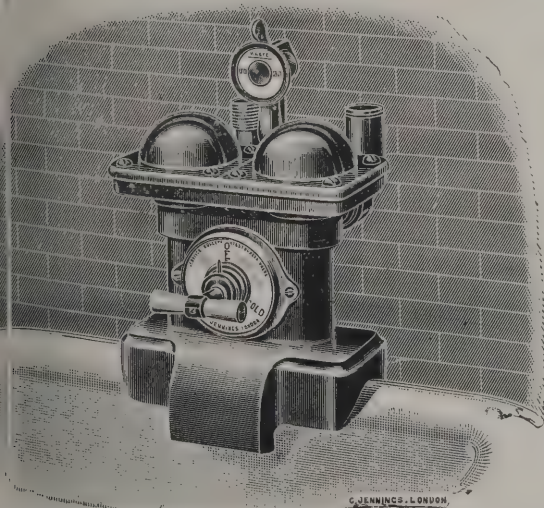
THE Pontefract Guardians have approved a scheme of workhouse extensions which will involve an ultimate expenditure of 30,000*l*. Only a portion, to the extent of 10,000*l*, is to be proceeded with at present.

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## TRADE NOTES.

JOHNSON HALL, Eccleshall, has recently been fitted with the latest improved hot-water heating apparatus by Messrs. John King, Limited, engineers, Liverpool, employing their "Rahnee" radiators and "Rex" radiator valves.

THE Cherry Tree Machine Company, Ltd., engineers and ironfounders, Cherry Tree, near Blackburn, inform us that they have secured the contract for the installation of a "Reck" disinfecter, boiler, &c., at the hospital, Garden Walk, Royston, Herts, for the Royston, Ashwell and Melbourne Joint Hospital Board.

MESSRS. HOMAN & RODGERS, engineers, of Marsden Street, Manchester, have secured contracts for the concrete fireproof floors and constructional steelwork to the Haxby Road and Poppleton Road schools for the City of York School Board; also the new nurses' home, County Hospital, York.

## ELECTRIC NOTES.

A PROPOSAL by the lighting committee of the Ayr Town Council to light the Esplanade by alternative schemes has been submitted. The one provides for the erection of sixteen arc lamps at a cost of 582*l.*, and an annual cost of 96*l.*, and the other for thirty-two pairs of incandescent lamps, each pair of 64 candle-power, and an annual cost of 115*l.* The electrical engineer recommended the arc lamps. The schemes were remitted to the committee for a report.

A MANCHESTER syndicate has been formed to apply for Parliamentary powers to erect electric generating stations and lay mains for the supply of electricity and power gas throughout a district comprising the county of Chester, the greater part of the county of Flint, the Wrexham district of Denbighshire, North Staffordshire, &c., a total of some 2,000 square miles, with a population of over 1,500,000. At a meeting of the Holywell Rural District Council a letter was read from Messrs. Rowcliffe & Co., solicitors, Manchester, the solicitors to the syndicate, expressing a hope that the Council would co-operate and help in the undertaking, which could not fail to be of great benefit to the district, and place it on a par with other districts. Several members said they should do all they could to further the scheme.

THE Post Office has been able to announce to the Associated Chambers of Commerce that the underground mains from Stafford to Warrington for the new telegraph cables are quite complete, and that the cables were ordered some time ago, and will all be laid very shortly, some being already down, so that probably by the end of the month underground wires between London and Manchester and London and Liverpool will be complete. A section of the main between Kendal and Shap has also been laid, but the wires will not be put down this year, unless it is necessary for temporary purposes to slip in four guttapercha covered lines. Mains are laid, too, between Preston and Preston Richard, a point about 10 miles north of Lancaster, and the cables are almost completed on this section.

Two schemes for the development of electric traction in the neighbourhood of Edinburgh have been submitted to the Town Council as a preliminary to Parliamentary sanction being sought. One proposal is for the formation of a company, and the construction by it of a tramway from the city of Edinburgh to the burgh of Queensferry. It is intended to run a tramway from the west end of Princes Street along Queensferry Road to a point in the burgh of Queensferry opposite the milestone marking eight miles from Edinburgh. The line will be worked by electricity, and probably the promoters will be able to arrange with the city of Edinburgh for a supply of electric power. Messrs. Blyth & Westland, C.E., George Street, Edinburgh, are the engineers, and Messrs. Drummond & Reid, W.S., of 21 Charlotte Square, are the solicitors in the matter. The provost, magistrates and Council of Queensferry unanimously approved of the proposal, and recorded their hope to have the line constructed as speedily as possible. The other scheme is one which has been previously before the Council. The Drake and Gorham Electric Power and Traction (Pioneer) Syndicate, Ltd., London, have written to the Edinburgh Corporation offering to enter into a friendly arrangement with the Corporation by which the gap now existing between the Musselburgh Tramways Order and the Edinburgh Corporation system could be bridged over, and that they would be prepared, if they were to get the support of the Council, to apply for a new tramway order in respect of this intervening gap. They would be prepared to enter into any reasonable agreement with the Corporation either for the transfer of the Order to the Corporation, upon terms to be agreed, or agreeing to sell the lines within the city boundaries to the Corporation when constructed, upon

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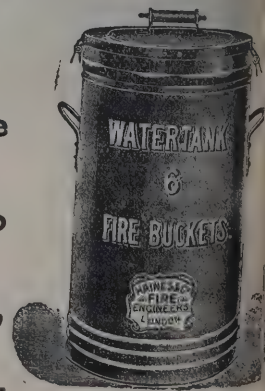
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the Corporation granting the lease of these lines so as to enable the cars running through Musselburgh to join up at Joppa with the Corporation's cars. The letter has been remitted to the Lord Provost's committee.

### VARIETIES.

THE opening of the free library and public hall provided for the village of Steeple Claydon, in Buckinghamshire, took place on the 8th inst. The block of buildings have been erected at a cost of about 1,700*l.*, exclusive of the furniture, fittings, &c., and stands in an elevated position at the top of the village.

LORD REAY (chairman of the School Board for London) formally opened the new higher-grade school which has been recently erected by the Board in Gassland Road, South Hackney, on Tuesday evening. The building, which has cost over 30,500*l.* (exclusive of site), contains accommodation for 816 boys and girls.

THE Bishop of Burnley has dedicated new vestries which have been built at All Saints Church, Habergham, Burnley. The buildings have cost about 320*l.*, and include a large vestry for the choir, a considerable addition to the clergy vestry, and a room for the accommodation of an electric motor to blow the organ. Further improvements in the church are contemplated.

SIR JOHN AIRD, BART., M.P., has arranged to leave London for Egypt on Tuesday next, in order to attend the formal opening by the Duke of Connaught, on the 10th proximo, of the Great Nile reservoir and dam at Assouan. The invitations to the ceremony, numbering about 400, will be issued by the Egyptian Government, and the guests will probably travel to Assouan in river boats.

THE old and historic Cloth Hall of Newbury, Berks, has been carefully restored as a memorial to Her late Majesty Queen Victoria, and was opened on the 7th inst. as the Victoria Museum and Art Gallery. The restored hall stands near the Market Place, and at the entrance to the spacious Corn Wharf, where there are other quaint timber-built corn granaries, to which use the Cloth Hall had long been devoted, after it had ceased to be utilised for its original purpose. Affixed to the front of the building, facing the Market Place, is a memorial-stone with the following inscription:—"This antient Cloth Hall

was repaired by public subscription as a memorial to Queen Victoria. Ano. Dom. 1902."

A MEETING of the Council of the Institution of Civil Engineers of Ireland was held at 35 Dawson Street, Dublin, on Monday, when the following were present:—Messrs. J. H. Ryan, president (in the chair); R. Cochrane and W. Ross, vice-presidents; William Anderson, James Dillon, Frederick J. Dick, M. Ruddel, R. O'B Smyth, Professor Pigot, W. H. Mills. A quantity of routine business was transacted. A general meeting was held at 8 p.m., when the President occupied the chair. A report was read from Mr. W. R. Maguire, associate, the Institution's delegate to the recent Sanitary Congress at Manchester, the discussion on which was postponed until next meeting in December. A ballot for candidates resulted in the election of Mr. Henry Browne as associate member, and Mr. George Browne as associate.

ST. ANNE'S Institute, Birkenhead, in connection with St. Anne's parish church, was opened on the 10th inst. There is a hall about 54 feet by 30 feet and 18 feet to ceiling, with a gallery at one end and three classrooms adjoining, 20 feet by 18 feet each, the whole of which can be thrown into one room to accommodate about 400 people on the ground floor and about eighty in the gallery. There is a gymnasium at back 50 feet by 18 feet and 19 feet high in centre, with a kitchen between it and hall for teaching cookery. The hall has two cloak-rooms at front and two retiring-rooms and platform or stage at the other end, with space under for storing of forms and chairs. The heating is by hot water from boiler in basement. There is a playground at side of about 165 superficial yards, with the necessary conveniences. The whole has been built substantially with bands and dressings of terra-cotta and red brick by Mr. James Merritt, builder, of Birkenhead, under the supervision of Mr. James N. Crofts and Mr. Charles Wise, of Liverpool, who have acted as joint architects. The cost of building was about 2,400*l.*

### BUILDING AND BUILDERS.

AT the last meeting of the Driffeld Board of Guardians, plans prepared by Mr. Joseph Shepherdson were laid before the Board for an enlargement of the workhouse infirmary at a cost of about 3,000*l.*, and, after some slight discussion, adopted.

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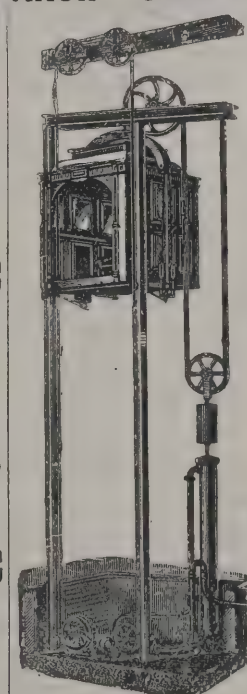
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**SATISFACTORY** progress is being made in the rebuilding of the Wesleyan Centenary House in Bishopsgate Street, London, the headquarters of the Wesleyan Foreign Missionary Society, and the work is expected to be completed by about this time next year. The former structure, once well known as the London tavern, was purchased in 1839 to commemorate the centenary of the founding of the Wesleyan Methodist Connection, and the trust deed provides that a building shall always exist there as a memorial of that event.

The special committee appointed by the Clyde Trust to consider the improvement of the river and harbour met on Monday and resolved in favour of widening and deepening the river in order to meet the requirements of local shipbuilders, who had been invited to tender for the new Cunarders. The work will be entered upon at once, and will occupy close upon two years. When it is completed the largest type of vessel, warship or other, will be able to navigate the river.

An inquiry was held in Glasgow on Monday, the 10th inst., as ordered by the Secretary for Scotland, into the provisional order sought by the Glasgow Corporation to empower them to purchase fifty acres within or without the city boundary with a view to erecting houses for the poorer and labour classes. The scheme provided for borrowing 750,000*l.* After hearing the evidence, the Commissioners declared the preamble had not been proved, but granted borrowing power up to 150,000*l.* to carry out the present scheme.

At a special meeting of the members of the Bradford School Board tenders to the amount of 28,700*l.* were accepted for the erection of a school in Grange Road, Horton. The Rev. R. Roberts asked if the contractors whose tenders had been accepted were all paying the standard rate of wages. Mr. Priestman: They have all to sign our rule to that effect before we let the contracts. The Rev. R. Roberts: May I take it that such signing will be binding upon them? Mr. Priestman: It is as binding as it possibly can be.

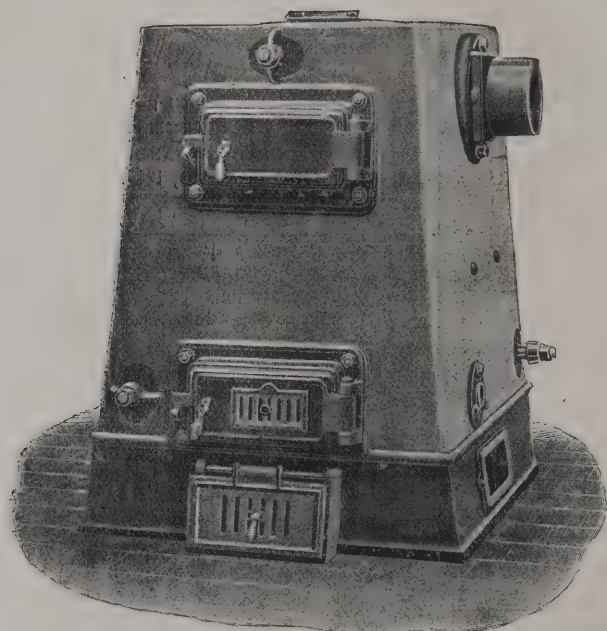
The borough treasurer of Southport has reported to the finance committee that the proposed expenditure of 14,000*l.* by the improvement committee on the improvement of Nevill Street, setting back the pier entrance, paving the footpaths and roadways, &c., would, provided the Local Government Board granted a loan, subject to twenty-five years' repayment, involve an annual charge of 873*l.* for interest and sinking fund. This is rather more than a halfpenny rate. At to-day's meeting of the Town Council it is anticipated the improvement committee will be asked to modify their estimate.

At a special meeting of Grangemouth, N.B., Town Council, held to consider a new water supply, two schemes were put forward, one in connection with the Stirlingshire Eastern District committee, which would cost the burgh 38,000*l.*, and one from the Bannock Burn, which with a 10-inch pipe track and reservoir would cost 51,000*l.*, and if a 12-inch pipe track were laid the cost, including reservoir, would be 62,800*l.* The meeting adopted the large scheme, which will require an assessment rate of 2*s.* 1*d.* per 1*l.* for capital expenditure and working expenses.

At Newport (Mon) Ald. Davis, the retiring mayor, laid the foundation-stone of the western anchorage of a transporter bridge. In order to provide means of connecting the eastern and western banks and yet not interfere with the river traffic, the Newport Corporation decided upon a transporter bridge. At the point where the bridge is to be erected the Usk is 750 feet wide, and from open latticework steel towers a girder suspended by steel cables will cross the river at a height of 177 feet. Upon this bridge, with girders for rails, will run a travelling frame, from which by wire ropes a car will be suspended at the ground level. This car is capable of carrying 66 tons, including vehicles and a large number of passengers. It will cross the river in one minute by means of electric motors. The estimated cost of the work is 90,000*l.*

### A NEW TENON JOINT.

MESSRS. TRUSS & Co., of 125 Fenchurch Street, are showing an invention which should be warmly welcomed by carpenters and joiners and those interested in their work. The twin-tenon joint, as it is called, consists of a short length of lightly made double-channel iron or wood of the following section, T, which fits into grooves of corresponding section cut obliquely to the joint plane of the wood by means of a special tool, and the effect is to produce a perfect grip and rigid joining of the parts. It is extremely simple, expeditious and efficacious, and whereas wood joined by the old-fashioned methods suffers considerably from drying and shrinking, causing ugly gaps and rickety joints, by the use of the twin-tenon joints the forces producing these cracks and gaps are actually utilised to make the joints closer and firmer; for as the wood shrinks it closes around and tightens its grip upon the iron twin-tenon, thereby converting what has hitherto been an insurmountable drawback into a positive advantage.



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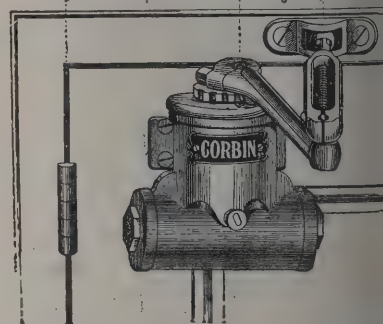
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**WORTH DRAINAGE AND SEWAGE-DISPOSAL SCHEME.**

LOCAL GOVERNMENT BOARD inquiry was held on the 31st Colonel W. R. Slack, R.E., into an application by the Rural District Council for sanction to borrow 25,000l. for a new drainage and sewage-disposal scheme for Bedworth. The clerk to the Council, explained that the necessity for a complete scheme had arisen from complaints of pollution of the river Anker by the sewage of Bedworth. Dr. Bostock, County medical officer, spoke as to the pressure brought to bear on the County Council on the Rural District Council, and that there had been several outbreaks of typhoid in Bedworth, and that until an efficient sewage-disposal scheme was carried out it was impossible to minimise many of the evils mentioned.

C. Nicholson Lailey, of Westminster, who had been consulted by the Council, described the scheme, which includes the laying of 10 miles of sewers. Mr. Lailey suggested that as the site of the outfall works is clay, the Local Government Board should be asked not to insist upon the purchase of land on which to irrigate the filtered effluent.

The purification scheme adopted embodies the most modern and efficient bacterial oxidation—beds which will be supplied by the Candy Whittaker automatic revolving sprinklers. This type of bacterial bed has been proved to effect over 99 per cent. of bacteriological purification as well as to produce effluent that is chemically of the highest class.

Lailey, in reply to inquiries, said the scheme he had proposed for them was the cheapest, and to his mind the best that could be carried out. The Inspector stated that the Council were acting under high expert advice, and that the medical officer, Dr. Bostock Hill, who had great experience in these matters, concurred in the scheme.

**LIVERPOOL CATHEDRAL.**

A general committee of the proposed Liverpool Cathedral was formed on the 12th inst., under the chairmanship of Lord Derby. It was reported that the subscriptions promised amounted to 156,017l. 9s. 6d., of which 80,812l. 18s. 5d. had already been received. Lord Derby reviewed the highly successful efforts of the executive committee, and explained the provisions of the Liverpool Cathedral Act, which contained

provision for substituting the chapel of St Nicholas for the church of St. Peter as the parish church of Liverpool at or after the opening of any portion of the cathedral for Divine service. The scheme, his lordship said, had been taken up in a large and generous spirit, and though they would have to ask later on for further funds, he was one of those who thought that they would require to establish their position still further before they made any wide or general appeal for funds. The Lord Bishop of Liverpool (Dr. Chavasse) complimented the executive committee on the manner in which they had carried out their duties, and remarked that endless suggestions and criticisms which had been sent in had been considered by them. Mr. Robert Gladstone mentioned that 103 drawings were received in the preliminary competition for the cathedral design, and this number had been reduced to five. The time for the final competition to be sent in had been fixed for April 30 next. Sir William B. Forwood, the chairman of the executive committee, thought that the foundation-stone of the cathedral ought not to be laid until they were sure of 200,000l.—45,000l. more than was at present promised. A cathedral worthy of Liverpool would, in their opinion, cost probably 500,000l. Lord Derby was cordially thanked for presiding and for the interest he has all along evinced in the scheme.

**LONDON BUILDING ACT.**

JUDGMENT was given on November 6 in the case heard on October 16 of a building, No. 116 High Holborn, being over 10 squares in area and not properly separated as required by Section 74 sub. 2. The magistrate remarked that a portion of the vaults shown on the plan had been bricked up and abandoned, and were therefore not now calculated in the area of the building. Order was made to comply with requisition of district surveyor within fourteen days and pay 3 guineas costs.

A summons for neglect to comply with a notice of irregularity—London Building Act, 1894—was heard on October 16. The defendant had erected an enamelled iron advertising sign over and covering the first-floor window, obstructing all light and ventilation to a habitable room at No. 195 Shaftesbury Avenue, contrary to Section 70. The district surveyor stated that the structure had been removed and the summons was withdrawn upon payment of 13s. costs.

Both cases arose in Mr. C. F. Hayward's district.



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## NEW SCHOOLS AT HANWELL.

THE new St. Ann's schools in Springfield Road, which have been erected to the designs of Mr. William Pywell, of Hanwell, are to be formally opened to-morrow (Saturday). The buildings comprise three distinct blocks; a school for boys and girls on one side and infants' school on the other, with the School Board offices and caretaker's house between the two.

They will accommodate 1,230 children in two departments, all on one storey, viz. a senior mixed school consisting of twelve classrooms grouped round a central hall, and an infants' department as a separate building.

The site on which the schools are erected was formerly known as the "Spring field," of about 2½ acres, and contained the famous St. Ann's well, which has now been drained, filled-in and covered over. The schools take their name from the saint to whom the well was dedicated.

The school for 780 boys and girls, although designated a mixed school, is not strictly so, because the upper standards of boys and girls have separate and distinct classrooms, and it is only in the lower standards that the boys and girls are in mixed classes.

The school is designed on the central-hall plan, with twelve classrooms, six on either side of the hall. Male and female teachers' rooms, stock-rooms, boys and girls' cloakrooms, lavatories, caretaker's sink and entrances are respectively provided at either end.

All the classrooms are lighted by windows to the left hand of the scholars and separated from the central hall by glazed screens.

The central hall is 72 feet long, 40 feet wide and 30 feet high at the ceiling line, and has five open hammer-beam principals supporting the roof. The hall is amply lighted by windows at each gable end and by the glazed screens at the sides. In the basement under the cloak-rooms at one end of the building are a heating chamber, coal and coke stores, a repairing shop and general store for chairs, desks and spare furniture. The floor over the basement is of fireproof construction. A subway from the basement connects the three blocks of buildings and contains all main supplies and junctions, thus facilitating inspection and repairs without breaking up the surface of the playground. The infants' school for 450 infants consists of a schoolroom 58 feet long, 24 feet wide and 18 feet high; three classrooms, each for sixty first, second and third-class infants, and a babies' department of two rooms

for Kindergarten instruction to 130 children. The teaching room and stock-room are approached from a gallery over senior infants' cloak-room and entrance. Two entrances, cloakrooms and lavatories are provided for senior and junior infants respectively, and an exit is provided immediately from schoolroom to the playground. Lavatory accommodation for the teaching staff and a wash-up sink and store for the caretakers are placed near one entrance. The babies' entrance is placed directly facing the entrance to the girls' school, so as to conveniently allow the sisters to bring and take home their small brothers and sisters.

The design of the buildings has been conceived in the treatment of Early English Renaissance. The whole of the floors are of pitch pine wood blocks. All internal walls have brown glazed brick dados; the upper part of the walls are faced with gault bricks. The schools throughout are heated by water on the low-pressure system of pipes and radiators assisted by open fires when requisite. All school and classrooms are provided with fresh air inlets, and the top lights of all windows are made to open at the ceiling level actuated by steel rods and screw gear. The vitiated air is extracted by means of ventilation flues and ceiling ventilators. The ceiling ventilators take the form of a compass marked with the cardinal points, thus in every room the north point and the aspect of the room are readily obtained and is an instructive object lesson to the scholars. The desks throughout are dual desks executed in oak. In the senior schools the three back rows of desks are raised on stepped floors. In the infants' department the desks are on the level floors, except that a gallery for the babies is arranged in a separate room. The Board's office block consists of a Board-room, clerk's office and lavatory accommodation and the caretaker's apartments of parlour, kitchen, larder, three bedrooms and offices.

The Board-room is 30 feet long, 18 feet wide and 15½ feet high to the ceiling. It is divided into three bays by two timber roof principals, with curved ribs supported on stone corbels bearing the Board's monogram on shields in relief. A painted lincresta dado with moulded skirting and capping surround the room as well as the entrance hall. At one end of the Board-room is a large open fireplace with hobs and tile linings and hearth, set within a marble chimney-piece and kitchen fender; at the other end is a large five-light stone mullion window, with transome, and glazed with leaded lights. The external walls throughout are faced with yellow stock brick with red dressings and purple-grey bands. The para-

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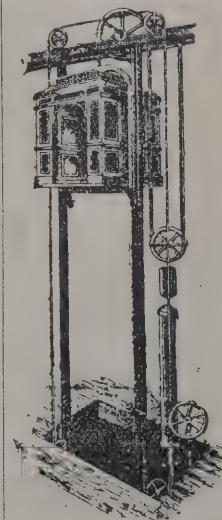
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gs, sills and other stonework are executed in red Dumfries. The roofs of the school buildings are covered with green tiles, while the offices and caretaker's block is roofed with red tiles, which gives a domestic character to the central block, and makes a pleasing break in a large mass of roofing. The playgrounds are tar paved, and are divided mainly enclosed with brick walls, and each provided with a covered play-shed, drinking-fountain and the usual benches. Great care has been exercised in fitting up the men's out offices to insure perfect cleanliness and healthy surroundings. The contract price for the whole of the works is £1,457 17s., and the furniture £217.

### PENRITH SEWAGE SCHEME.

On Saturday night a private meeting of the Penrith Urban District Council was held at the Public Offices to consider the development of the sewage outfall scheme. Mr. Winterbottom presided. A report by the sewerage sub-committee was submitted to the general purposes committee, which met that evening. It stated that an interview had been obtained with a representative of the Local Government Board at Carlisle, and the proposed scheme for acquiring Westmorland Holme was formally abandoned. The report continued:—On October 11 Messrs. Brierley & Holt, engineers, Blackburn, were instructed to inspect and report upon other lands in the neighbourhood of Penrith suitable for sewage disposal, and after the necessary investigation, levelling and mapping, they reported that 25 acres of Whinfell Holme, the property of Lord Hothfield, is the most suitable. Consideration has been opened with the agent of Lord Hothfield (Mr. R. B. Barrett) with the view of purchasing the land, named by agreement if possible, but in order to provide for the eventuality of the failure of the negotiations, the sub-committee consider that it is absolutely necessary that the Council should be in a position to petition the Local Government Board for a provisional order in respect of such land in time for passing the Act confirming the order throughout the session of 1903. If this is admitted the Council should at once instruct the necessary steps to be taken, and statutory notices have to be advertised and plans deposited this month (November). In regard to the present use of Westmorland Holme your sub-committee have had their

attention called to a small arm of land which requires to be immediately put out of use for irrigation purposes, and in order that this may be done and the work at the Holme conducted in a thoroughly satisfactory manner during the remaining period it is in the hands of the Council, instructions have been given to lay a new drain from the precipitating-tanks to a suitable site about 173 yards distant, at an estimated cost of 70% to 80%.

On the recommendation of the general purposes committee it was resolved to instruct the Clerk to take all the requisite steps to obtain compulsory powers to purchase 25 acres of the Whinfell Holme and land for roadway thereto, and that his services in connection therewith be remunerated by such sum as the Council may hereafter fix.

### A GOVERNMENT CONTRACT.

ON September 11, 1899, Messrs. B. Graham & Sons, of Huddersfield, entered into a contract with the Commissioners of Works and Public Buildings for the erection of a post office at Stalybridge. Before the contract was completed it was determined by the Commissioners, who took possession of the unfinished work, materials and plant. The defendants justified their action under the terms of the contract on the ground that the plaintiffs had put in the roof of the sorting office joists which were not according to the specifications, and failed to remove them on the order of the architect. An action was brought at the Leeds Assizes in August 1901 by the contractors. The Lord Chief Justice held that in the circumstances the defendants' architect had not adjudicated on the quality of the timber himself, but had delegated this duty to the clerk of the works, and that as the architect's adjudication was a condition precedent to the defendants' right to terminate the contract, gave judgment for the plaintiffs. From this decision the defendants appealed. There was also a cross appeal by the defendants, who contended that the learned judge was wrong in not leaving to the jury the question of whether or not the defendants had waived their right to terminate the contract. In the Court of Appeal the case was heard by the Master of the Rolls and Lords Justices Romer and Mathew.

The Solicitor-General said that shortly the question really came to this, whether the defendants' architect, who had certain powers under the contract, had adjudicated on certain defaults of the builders, which adjudication was a condition

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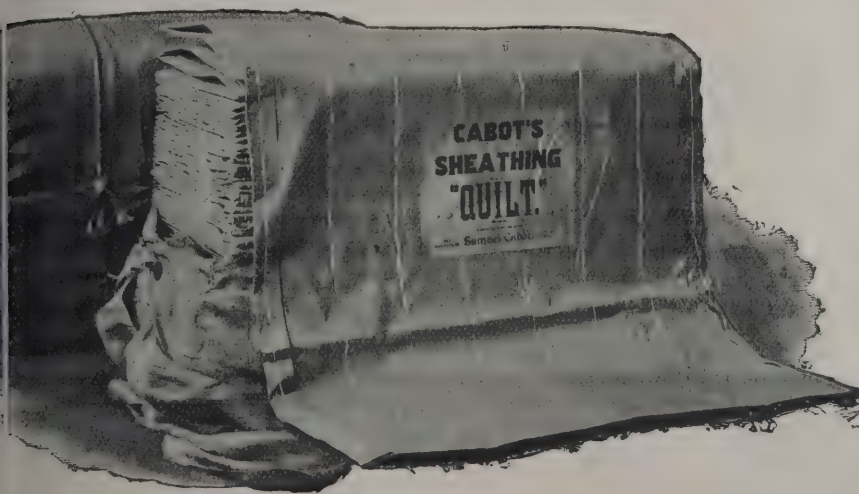
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precedent to the defendants having power to determine the contract and to enter into possession of the works themselves. As far as he could see the whole judgment of the learned Lord Chief Justice turned upon that one question. The learned judge held that there was no evidence of adjudication by the architect at all, and that therefore the Commissioners had no right to terminate the contract. There was a special jury, but his lordship thought there was no question for their consideration. The Court would see that in one view of the case there might be a question which ought to have been left to the jury, but at an early stage in the proceedings the Lord Chief Justice said he would not allow evidence on the question as to whether there was in fact default by the builders to be submitted to the jury.

The Master of the Rolls said the first question to be decided was whether the architect had acted in accordance with the terms of the contract, so as to justify the defendants in determining the contract. If the Court should be of opinion that there was a consummated forfeiture, then there arose a second question of whether the defendants had waived their right to exercise that forfeiture. As to the first point, the Lord Chief Justice had held that the architect had not adjudicated on the matter, in that he delegated the duty of inspection to his clerk of works. By the terms of the contract the architect could order the removal of any materials used in the building that "appeared to him" not up to the specified quality. The plaintiffs' contention was that that being so he must himself examine and decide upon what particular timbers were not up to quality. What the architect actually did was to examine the wood on the ground, and finding that it was not of the required quality direct the clerk of the works to mark the timbers already put in the roof of the sorting-house to which he objected. Upon that gentleman's report the architect framed his certificate, and the question was whether in these circumstances the architect could be said to have adjudicated on the matter. It was perfectly obvious as a matter of business that one could not expect an architect to go into every detail himself. He (the Master of the Rolls) had no hesitation in holding on the authorities that the architect, having himself first ascertained that the timber being used was not of the stipulated quality, was perfectly entitled to delegate the duty of particularising which of the timbers had to be removed. That being so, the defendants had the right to terminate the contract, if they had not waived their right of doing so. His Lordship added that a cross appeal had been

made by the contractors, who contended that in respect of forfeiture a more than reasonable time was allowed to elapse before the certificate of the architect was obtained. That was a point which would involve the consideration of facts, and it seemed to him that the judge was not justified in withdrawing the matter from the jury. The case would therefore have to go back to the jury to have that point decided.

Lords Justices Romer and Mathew concurred.

### DEEPENING THE THAMES.

IN May last the engineer of the Thames Conservancy was instructed to report upon the cost of deepening the navigable channel of the river between London Bridge and the entrance to the Millwall Docks. After consideration of his report, which was presented in June, the Conservators have determined to dredge the river, so that there will be a depth of water at lowest spring tides of 14 feet between London Bridge and the Thames Tunnel, the channel being 200 feet broad, this being the greatest width possible, owing to the tiers. Below the Thames Tunnel the depth will be increased to 16 feet in a channel 300 feet wide. The cost of this work is estimated at 54,000*l*. At present the depth of the river above the Thames Tunnel is in some places no more than 10 feet 6 inches at low tide, owing to silting up. In this part of the channel a greater depth than 14 feet is not practicable, because there is only 13 feet over the roof of the tunnel, and as the Commissioners on the Port of London point out in their report, a certain thickness of soil must be left above the top of the tunnel, which consequently must render of little practical use any deepening of the Pool further than that which is now to be undertaken by the Thames Conservancy.

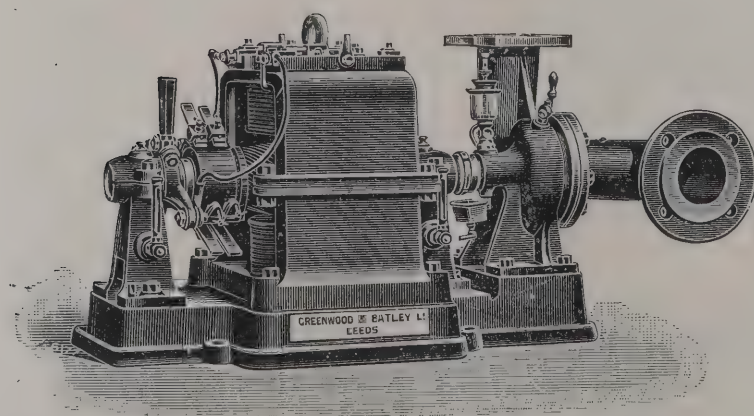
### GERMANY AT THE ST. LOUIS EXHIBITION.

THE official decision of Germany to take part in the Universal Exposition to be held in St. Louis in 1904 has long been assured. The delay in making the announcement has been due wholly to the exigencies of the domestic situation and to the depression in business prevailing during the past two years. In fact, after the visit of Prince Henry to St. Louis, the tender by the Emperor of a statue of Frederick the Great

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city of Washington, and the changed attitude towards the doctrine recently apparent, participation on large lines certain. These have been an earnest of the Emperor's desire to please and conciliate the Americans upon both the political and personal sides.

High politics has, however, been only one of the influences which have led to this decision. The principal idea, never out of mind, has been that of broadening the demand for German wares, the result that there is general concurrence in the opinion as to the necessity and the helpfulness which come from the most perfect and varied displays at all the great exhibitions, that at Paris in 1900 was striking, following though it did the failure to exhibit there at all in 1889. The great Krupp works which has so distinctly been built up to its present proportions by the policy inaugurated at the Great Exhibition of 1851, and since maintained without interruption, really been the one potent example.

The latest returns show in a very striking way the growth of trade relations between the United States and Germany. In the Chicago Exhibition of 1893. In that year the exports of the United States to Germany amounted to 92,357,163 dols. There had increased in 1901 to 191,780,427 dols. Last year there was a reduction of about 18,000,000 dols, due wholly to the change in the maize crop. In the year following the Chicago Exhibition the imports of German merchandise into the United States were 69,387,995 dols. In 1902 these had become 99,995 dols. Both in imports and exports Germany, in relation to the United States, has passed France, and is second in importance, although still far behind the United Kingdom, the predominance of which in both respects still remains unchallenged.

At the Chicago Exhibition of 1893 Germany expended about 800,000 dols. (160,000 £) upon its buildings, its official display, and as an aid to the manufacturing and commercial centres. No country in the world has been quicker to see the importance of the phenomenal growth of population and wealth which has been going on in the Mississippi Valley during the last twenty years—an expansion in purchasing power which has not escaped the knowledge and attention of the Emperor. This far no announcement has been made of the sum likely to be set aside for use at St. Louis; but from assurances given by the Emperor, that for the purpose of illustrating every phase of artistic, manufacturing, agricultural and industrial development Germany would make at St. Louis the finest exhibit ever shown from that country, the conclusion has been reached

that at least 4,000,000 marks (200,000 £) will be set aside for this purpose. The Commissioner, whose appointment has just been formally announced, sailed at once in order to investigate upon the spot the progress made in the preparation for this exhibition, and to choose the site for the building to be erected by his Government.

### THE ASSOUAN DAM.

ON Saturday evening Sir John Aird explained his operations in Egypt in connection with the Assouan Dam. Two of his partners, he said, were present and he thought he might say for all of them that they had had the opportunity afforded them of carrying out works which were not only of national but also of world-wide interest. Those works they had carried out, he might say, quite successfully. The secret of the success of the great work in which he had been engaged was that they had the advantage of several things; and first he must express the gratitude which had always been in his breast to the kind Providence which gave them two low Niles during the construction of the works, an event which had not occurred for forty years and did not exist now. He also desired to express his thanks for the kind and cordial assistance of the Government in enabling them to put their shoulders to the wheel and to make their backs firm so as to carry out the work they had undertaken, which they had accomplished at an earlier date than they had at first anticipated. He did not desire to take all the credit for the work. Mr. Fitzmaurice, now engineer to the County Council, who was the chief engineer at Assouan when they had commenced these works, and who, he was glad to see, was present that evening, had helped them materially to do what they had been able to accomplish and they were very grateful to him for his work on their behalf. He must also express his thanks to the fellahs who had worked so well, for, as in other cases, so in Egypt, it was not because of the work of one individual, but because they were able to get the valuable assistance of others that they found that they were able to do what they had done in that great and wonderful country. They had the help, too, of the Egyptian Government by their officers working with them in the matter, and so it was that by means of all these aids he had been placed in the position of one of whom it had been said that he had "dammed the Nile." They had probably read the telegram which came from Lord Kitchener last week. He was very

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proud to receive it, and it would be put in a frame, placed in his office, and treasured by the firm. Lord Kitchener had done them the greatest possible honour, and him the greatest pleasure one man could give to another, by expressing, as he had done, his kind appreciation of the work they had carried out for the benefit of Egypt, and he hoped also for that of this nation.

### RIGHT TO LIGHT.

JUDGMENT has been given by Mr. Justice Buckley in the case *Boyce v. Paddington Borough Council*, which related to the rights of adjoining owners to claim access of light from over disused burial-grounds. His lordship said:—

When stripped of all technicality the question to be determined in this action is whether the owners of lands circumjacent to and abutting upon other land which has become an open space within the Metropolitan Open Spaces Acts, 1877, 1881 and 1887, and the Disused Burial Grounds Act, 1884, become at once, by virtue of those Acts, or must be allowed to become, after the period of the Prescription Act, by virtue of an enjoyment which cannot be excluded by the erection of a hoarding, entitled as of right to the access of light to the windows of any buildings which they may erect contiguous to the open space. The open space in question is the disused burial-ground of St. Mary's, Paddington. The plaintiff is a person who has recently erected a large block of flats immediately abutting upon that open space, with numerous windows overlooking it. The defendants contend that they are entitled to erect a hoarding in front of those windows so as to preclude the plaintiff from prescribing for rights of light. The plaintiff says they are not so entitled, and asserts his case upon two grounds. He says, first, that he, as a member of the public, is entitled to insist that the space shall be an open space, from which it results that there will be free access of light to his windows; and, secondly, that, whether this is so or not, the defendants cannot erect a hoarding so as to prevent his becoming entitled by prescription, because they are by the relevant Acts of Parliament forbidden to erect any building, temporary or movable, except for the purpose of enlarging the church. A hoarding erected for the purpose of preventing the acquisition of a prescriptive right to light is, he says, a building. The defendants have raised the contention that the plaintiff cannot maintain the action without the concurrence of the Attorney-General. This contention, to my mind, cannot succeed. The

plaintiff is suing either in respect of an alleged right to the free access of light to his windows over the open space, or in respect of a public right to have the space maintained as open space without the erection of a hoarding, which he calls a building. In the former case he is suing upon an alleged private right; there is no public right of access of light to private property. In the latter he is suing in respect of an interference with a public right from which he personally sustains special damage. In either case he can sue without joining the Attorney-General. The public are not the owners of lights overlooking the space, and there is no public right to access of light to any windows. The public right is to have the open space so kept as to allow the enjoyment by the public of the space in an open condition, free from buildings. That right the plaintiff is entitled to as a member of the public, but any right to access of light to the windows of his property is not a public right. It is not a right which any member of the public enjoys in common with himself. If, therefore, he claims upon the footing that he has a right to the access of light to his windows, he is suing in respect of a private, and not a public right, and the Attorney-General is not a necessary party. Further, if he is suing in respect of a right as a member of the public to say no building shall be put on the land, and this hoarding is a building, there he would be suing in respect of a public right and the Attorney-General would be a necessary party, but for this fact—that the plaintiff personally upon this hypothesis suffers special damage from the breach of a public right, and if he do so suffer then he can sue without joining the Attorney-General. A plaintiff can, as it seems to me, sue without joining the Attorney-General in two cases; first, where the interference with the public right is such as that some private right of his is at the same time interfered with—as e.g. where an obstruction is so placed in a highway that the owner of premises abutting upon the highway is specially affected by reason that the obstruction interferes with his private right to access from and to his premises to and from the highway; and secondly, where no private right is interfered with, but the plaintiff, in respect of his public right, suffers special damage peculiar to himself from the interference with the public right. The former proposition, I think, is to be deduced from *Lyon v. Fishmongers' Company* and *Fritz v. Hobson*, and was one which I had to consider in *Chaplin v. Mayor of Westminster*; while the latter is to be found in *Iveson v. Moore*, *Hart v. Bassett*, *Benjamin v. Storr*, and *Winterbottom v. Lord Derby*. I think, therefore, that the

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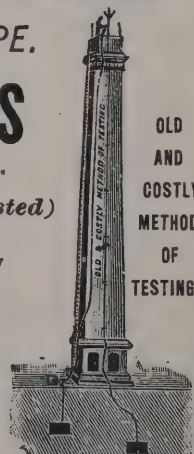
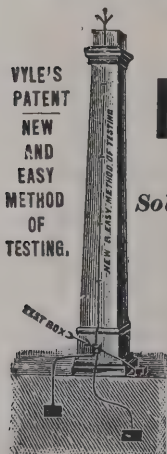
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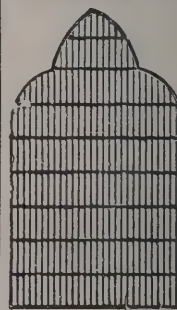
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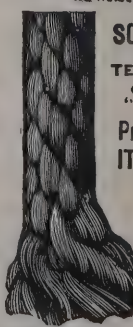
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is well constituted, and I pass on to consider whether the plaintiff has the right which he claims. At the outset it would seem to be an extraordinary proposition that, because an open space is devoted to the public for amusement in an open condition, free from buildings, for exercise and recreation (see Metropolitan Open Spaces Act, section 1, Act of 1881, section 5), the result should be achieved immediately, or by the unavoidable operation of the Prescription Act to the circumjacent owners, as matter of right, easement of light which theretofore they had not enjoyed. I point to one case in which such a construction certainly is admissible. A disused burial-ground which is so dealt with as to become an open space under these Acts may nevertheless be used for the purpose of enlarging a church, chapel, meeting-house, or other place of worship (see the Act of 1884, section 3). If the plaintiff's proposition were true, the owner of adjoining land would after the Prescription Act had run, be (without any power on the part of the owners of the open space to prevent his becoming) entitled to rights of light in the open space which might prevent the subsequent erection of such an enlargement as that Act allows. The proposition for which the plaintiff contends is evolved from the premises that because the space is to be an open space, there must be free passage of light over it to the windows of houses built on the adjacent land. This begs the question and assumes that a hoarding cannot be erected. The Acts do not contemplate the statutory creation of any such consequential rights in the neighbouring owners. The space is to be given for the public purposes for which it is to be enjoyed—namely, for exercise and recreation. It is not to be open so as to create rights in favour of adjoining landowners. The Act is not dealing with the creation of easements or the creation of any right other than a right in the public to enjoy the space as an open space for the purposes indicated in the Acts. As an adventitious advantage the owner of the adjoining land would, no doubt, in most cases in fact obtain the benefit of light. But he is not, I think, entitled to it as a matter of right. The rights created are public rights. There is no public right to have free access of light to windows on land surrounding the open space, or any part of it. The plaintiff's contention really is that he has that right which would be a private right because there is another and a better public right. But then the plaintiff says, "Assume by virtue of the statute I do not immediately acquire an easement, as a member of the public I have a right to insist that no

building shall be put upon the open space, and if no building" (which he says includes a hoarding for the purpose of preventing a prescriptive right) "is put up I shall under the Prescription Act get a right in time, and the effect of the Acts is that matters must be so left as that I shall acquire that right." This argument is rested upon a contention that a hoarding put up for the purpose of preventing the plaintiff prescribing under the Prescription Act is a building. Several cases have been referred to as to whether a hoarding is a building. In *Pocock v. Gilham and Wood v. Cooper* it was held that a hoarding or a screen was, and in *Slaughter v. Mayor of Sunderland*, *Wilson v. Queen's Club* and *Foster v. Frazer* that it was not, a building. From these cases I can derive no principle other than this—that a hoarding may or may not, according to the context, be a building. If the building spoken of be one which it is contemplated shall have a stuccoed front and a slate roof (*Foster v. Frazer*) or a building to be erected under a building lease (*Wilson v. Queen's Club*) a hoarding will not be a building. If the question arises under a lessee's covenant not to put up a building, and he does put up a hoarding which affects the adjoining occupier (*Pocock v. Gilham and Wood v. Cooper*) it may be a building. What I have to consider is whether such a hoarding as the defendants would put up to prevent the plaintiff from acquiring prescriptive rights would be a building within the Acts with which I have to deal. In my opinion it would not. It would be an erection, not put up for any purpose of building, but as a necessary act to prevent the acquisition of a prescriptive right. The word in section 5 of the Act of 1881 occurs in the connection that the land is to be enjoyed "in an open condition free from buildings." I think this means such buildings as would preclude or diminish its enjoyment in an open condition for exercise and recreation (Act of 1877, section 1). In section 3 of the Act of 1884 the erection of any buildings upon a disused burial-ground is forbidden except for the purpose of enlarging a church. I think the word "buildings" there means erections which would cover some part of the ground, as the enlargement of a church would do. It does not refer to something in the nature of a fence or barrier to prevent the acquisition of prescriptive rights to light. Upon these grounds I come to the conclusion that the plaintiff has not by virtue of the Acts acquired such an easement as he seeks to enjoy, and that the defendants are not by the Acts precluded from erecting such a hoarding as is necessary to prevent him from obtaining the benefit of the Prescription Act. I think, therefore, that the action fails, and I dismiss it with costs.



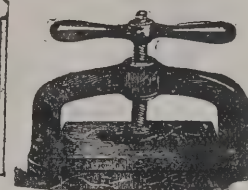
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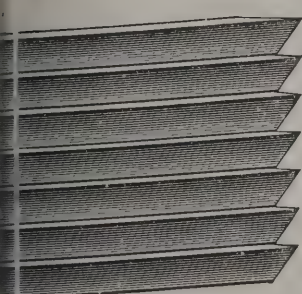
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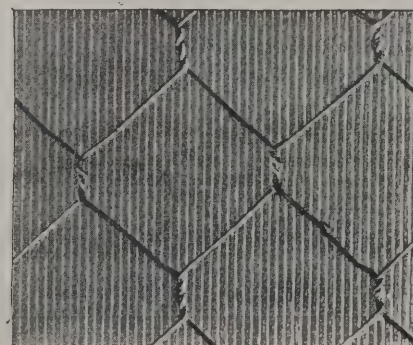
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**CROSS TRAFFIC IN LONDON THOROUGHFARES.**

THE highways committee of the London County Council have reported upon the question referred to them at the beginning of the year, of dealing with cross traffic in main thoroughfares by means of bridges or subways. The chief engineer of the Council, in dealing with the suggestion for the construction of a subway to meet the cross traffic at the junction of the Strand with Wellington Street, and of Holborn with Southampton Row, has pointed out that the scheme already sanctioned by Parliament for the construction of a shallow, underground tramway from Theobald's Road along the new street to the Strand would make the construction of a subway for ordinary vehicular traffic impracticable, and that it would also be impracticable to find space for the approaches to a bridge over Holborn in consequence of the tramway subway, when it will come to the surface in Southampton Row. If a bridge with inclined approaches were constructed from Wellington Street to Waterloo Bridge it would be necessary to remove the western steps of Waterloo Bridge and to carry the approach to the first abutment of the bridge, with the result that even then the gradient would be as steep as 1 in 20. This could be improved to 1 in 30 if the inclined road were extended to a considerable distance on to Waterloo Bridge, involving a widening of the northernmost span of the bridge. This widening could not be carried out by merely widening the arch, but would necessitate a girder span over the Victoria Embankment, unless the bridge were widened for its entire length across the river. It would be necessary to widen Wellington Street and to place the inclined approach in the middle of the widened thoroughfare, because if the inclined approach were placed on one side of the street one line of the traffic using the approach would, upon reaching Waterloo Bridge, have to cross one line of the traffic passing on a level to the Strand, with the result that the construction of the bridge would do little more than tend to remove from the Strand the congestion caused by cross traffic to the point where the inclined approach delivered on to Waterloo Bridge. To construct a subway for general traffic from Southampton Row under Holborn would not only involve considerable interference with the projected tramway-subway scheme, but would also make it necessary either to syphon the Fleet sewer in Holborn or to divert the sewer at considerable expense. The highways committee feel that they have no alternative at the present moment but to advise that the question of the con-

struction of a subway or bridge at the junction of the Strand with Wellington Street, and at the junction of Holborn with Southampton Row should be postponed until after the formation of the new street from Holborn to the Strand.

**REGISTRATION OF PLUMBERS.**

MR. WALTER LONG received at the Local Government on the 6th inst. a large deputation representative of all every part of the country, and of all shades of politics in regard to the Plumbers' Registration Bill. A number of medical other bodies were also represented.

Sir L. M. M'Ever, M.P., introduced the deputation, which included Sir S. Crossley, Bart., M.P., and many others.

It was stated that more than half the members of the House had expressed approval of the Bill, which had passed the House of Lords and was now before the Lower Chamber. Among the speakers were Alderman Sir John Knill, master of the City of London, and Mr. Coles, clerk of the Plumbers' Society, and others.

Mr. Walter Long, in reply, said he entirely recognised the influential character of the deputation, the whole country being represented in some form or another. He had no hesitation in saying that the Government regarded the measure with hearty approval and with goodwill, for there was great room for improvement in plumbing work.

However great the discoveries of science, and how anxious the householder might be to have the best system of drainage in his house, his efforts were likely to be defeated if work so carelessly done that all appliances were rendered useless, with a consequent spread of disease. So far as the prospect of the Bill was concerned, they were almost in sight of Paradise, and they only wanted to get those gates open.

Personally, he regarded the present position of non-controversial legislation in the House of Commons as most unfortunate and most serious for the country at large. There was no department where there was greater need of departmental legislation than his own, and yet it was a practical impossibility for him to carry less contentious measures of his own.

It would not be honest of him to say that he could advise the Government to take up the Bill in the present state of public business, but he suggested that Members of Parliament interested in its provisions should endeavour to render it uncontroversial, in which case he would support it in Parliament.



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# The Architect.

## THE WEEK.

ON May 10 WILLIAM HENRY BARLOW was presented with a testimonial and address from the members of the Institution of Civil Engineers, congratulating him on attaining his ninetieth year. He passed from this life on the 12th inst. His name has been long associated with construction. He and his brother were sons of PETER BARLOW, who was professor at Woolwich, and whose "Treatise on the Strength of Materials" is still recognised as a standard work of reference. The sons were also authorities on materials. WILLIAM BARLOW gave much attention to strains in beams and the determination of the neutral axis. He demonstrated that there was an element of strength in beams subjected to transverse strain arising from the lateral action of the fibres or particles on each other, which tended to modify the effect of the unequal strains and opposite forces, and thus diminished the amount of extension and compression which would otherwise arise, constituting in effect a resistance to flexure. In the early days of railway construction WILLIAM BARLOW was engaged on the Manchester and Birmingham line. At a subsequent time he became engineer of the Midland system. Acting on a suggestion of some Burton brewers who wished to have cellar space unimpeded by columns, he designed the roof of the St. Pancras terminus as a single span, a feat which at the time was without precedent. As a consulting engineer his advice was widely sought.

WHEN the extent of the limestone formation in these countries is considered, it indicates a defect in our commercial system that it is necessary to go to Belgium and elsewhere abroad for lime. At the meeting of the London County Council on Tuesday it was decided to order 14,800 tons required at the Barking outfall from a Belgian firm. During five years Belgian lime has been utilised in the works of the Council, and, according to one of the members, it answers better than English lime. When so much money is expended on Belgian iron and steel every year there seems to be little use in condemning the importation of lime. But every case of the kind makes it more evident that the field for British productions is every year becoming more narrow in Great Britain. There is no doubt that one cause is the difference between the facilities offered for the carriage of goods and materials in this country and abroad. In all parts of England complaints are heard about the obstacles which exist to the conveyance of goods, as if railways were intended for passenger traffic alone. The shipping companies are also apparently indifferent to trade. There are no doubt other causes at work, and the evil which arises in connection with the building trades especially is not to be remedied by optimistic theories about the advantages of Free Trade as a whole.

THE decision which was given on Tuesday by Mr. Justice FARWELL in WEBSTER v. BREWES should make the necessity more apparent than heretofore of having a general plan indicating the class of buildings to be erected whenever an estate is sold in plots or let on leases. It is not pleasant, for instance, when a man will convert part of a garden into a site for a stable regardless of the inconvenience which will arise to his neighbours. Some will say the local authority need not pass the plans for the stable, but that is one of those theoretical conclusions which do not always apply to actualities. In the case mentioned above, which related to an estate at Enfield, it was covenanted that the purchaser, his heirs and assigns, would not erect on the land any buildings other than one or two detached villa residences "with the appurtenances thereto," of a certain value. The defendant was not satisfied with having stables and coachhouse as well as a dwelling-house on his plot, but erected a building 30 feet long and 20 feet high for the storage of bicycles, firewood, sundry utensils, &c. The plaintiff demurred to the new erection on the ground of obstruction of light and air and interference with the view from the windows. His lordship considered that the purposes for which the building was

erected were reasonable, and that the defendant was entitled to erect such a building without regard to the convenience of his neighbour, who could not dictate to him the height to which or the position in which it ought to be built. The case was therefore dismissed with costs. To a lawyer, that was the only proper ending. An architect must, however, believe that the outbuilding diminished the amenity of any adjoining properties, and might have an injurious effect on their value. It is not to be denied that new requirements have occasionally to be met. Many a prim suburban garden has been spoiled by improvised sheds for bicycles, and those structures become eyesores to those who do not employ similar machines; but who is to make a sacrifice in such cases?

THE Château d'Eu, of which about two-thirds were destroyed by the conflagration of last week, if considered as a work of architecture was not one of the remarkable buildings of Normandy. It was erected by the Duc de GUISE in 1578 on a site where a castle stood that belonged to several ancient families in succession, and which was consumed by order of LOUIS XI. The building was an example of construction in red brick, and was erected under the direction of CLAUDE LEROI. The roofs were of slate and of excessive height. In modern times its uses were varied. During the first revolutionary period it was used for a hospital. NAPOLEON wished to make of it a country house. When it came into the possession of the Duc d'ORLEANS, afterwards LOUIS PHILIPPE, it was enlarged and adorned. On the walls over a thousand portraits were hung. In it was placed the statue of *Joan of Arc*, by the Princess MARIE OF ORLEANS, which was popularised by plaster statuettes. After the flight of the king the portraits were removed. The chapel contained windows of painted glass, which were among the products of the Sèvres factory. It is remarkable that all of them escaped unbroken during the fire. It is supposed that the danger arose out of carelessness by the servants, and when the flames burst out there was not sufficient water to overcome them. It is believed that the losses will be met by insurances, but no money can restore the historic associations connected with the parts which have vanished.

AN endeavour has been made by one of the Bohemian learned societies to demonstrate that it is not necessary to have a numerous and costly expedition in order to obtain information about districts which have at one time attained some celebrity. A couple of professors, a government official and an architect have had the courage to visit together the land of the Isaurians in Asia Minor. The goal of their journey was Konieh, formerly known as Iconium. The explorers have been rewarded by over three hundred inscriptions, the greater part being unknown to scholars. There was no money to expend on displaying the remains of ancient buildings, but about four hundred photographs were taken, many of which will provoke inquiry and, it may be, will lead to further research. One interesting Hittite monument was seen in Fassiler. A statuette was evidence of the presence of a Greek artist or a worship derived from Greece. The little expedition was also able to obtain geographical information, by which maps of Asia Minor can be corrected.

ALTHOUGH Great Britain exercises political and financial power in Egypt, yet in all things relating to the arts France somehow retains supremacy. The new museum of antiquities in Cairo, which was opened on Saturday, has been designed by a Frenchman, M. MARCEL DOURGNON. He was also the architect of the Egyptian Palace which formed part of the International Exhibition of 1900. M. DOURGNON was a pupil of M. PASCAL. He had charge of the construction of the Bourse at Valparaiso, and also assisted at the works of the Institute of Oriental Archaeology and of the Hôtel de Ville, Paris. With M. DENYS PUECH, the sculptor, he designed the monument of Mdlle. HENRIOT, the young actress who lost her life in the fire at the Théâtre Français. M. DOURGNON in his design has preferred the Classic to the Egyptian or the Arabian style. The building is arranged in such a way as to have the heaviest remains on the ground floor, and on the first floor are objects in glazed cases, with special rooms for jewellery, &c. The new museum is a substitute for the Boulak Museum.





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### THE FRENCH ACADEMY OF FINE ARTS.

IT is remarkable that among all the academies of art in Europe the Académie des Beaux-Arts alone can claim to exercise influence which is not local. Whether it is the oldest, and on that account has a right to receive attention, may be disputed. There are academies in Italy which are said to have been constituted at an earlier period, but as the line of continuity was occasionally broken, doubts have arisen about the true age of those institutions. The Académie des Beaux-Arts, if not identical with the academy which LOUIS XIV. founded in 1648 at the suggestion of COLBERT, and on the lines laid down by LE BRUN, is at least its legitimate successor. There were originally three academies of art, viz. painting, sculpture and architecture; but in Rome, at least, it was recognised that the united students formed one body.

The Académie Française, which was to be the guardian of the French language, was erected some years earlier, mainly by the efforts of Cardinal RICHELIEU. There was consequently some friction about the relative positions of the literary scholars and the artists. In France there is a love of system which in government leads to centralisation. One of the early Acts of the National Convention was to fix academies on a new base. The world of knowledge was divided into three great classes, viz. (1) physical and mathematical sciences, (2) moral and political sciences, and (3) literature and fine arts. That signified the downfall of several bodies in France which were known as academies. But the arrangement was not permanent. By 1803 it became doubtful whether ethics and politics could be regarded as sciences, and consequently they were suppressed in an official sense. It was also concluded that literature and art were not sufficiently allied in their methods to be united. It was therefore decided to separate the language and literature of France from those of ancient times. The fine arts were to be classed apart. Another change was made at the Restoration, and the relative position of the academies was determined by the dates of their foundation. When LOUIS PHILIPPE's turn arrived for ruling he also tried his power on the academies. He determined to have five, viz. the Académie Française, an Academy of Inscriptions and Literature, an Academy of Sciences, an Academy of Fine Arts, and an Academy of Moral and Political Sciences. While each had its own rules, they were all to form part of a body to be known as the Institut.

The Academy of Fine Arts, as the representative of the academies of painting and sculpture, music and architecture, was to contain followers of those arts. Engraving, including medals and gems, was also included. As in the case of other academies, the preparation of a dictionary of the terms used in the fine arts was to be one of the duties of the members. As yet, however, no complete dictionary has been published by any section of the Institut.

If the interest of foreigners could be taken as a test,

the Académie des Beaux-Arts is the most successful of all. The purity of the French language has more attractions for natives than strangers; science, archæology and ethics can be studied with at least as much advantage in other cities as in Paris. But as yet Paris is universally recognised as the capital of modern art, and, directly or indirectly, the Académie des Beaux-Arts is its omnipotent power. The jurisdiction is often disputed, and some will not accept the edicts of the law-givers. Still, it must be owned that no fallible potentates are to be found who are more disposed to do right by securing the triumph of art than the Academicians. Their position is considered as a solemn trust, and although prizes and appointments are necessarily confined to Frenchmen, yet foreigners from all lands can take advantage of the means at the disposal of the Academy for instruction in art.

The annual assembly for the distribution of prizes which was lately held was enough to show that the academical authority has not overcome the spirits of the young artists. They were as unsubdued as ever. The president for the occasion was M. JEAN PAUL LAURENS, who, although he never disposes himself to win the favour of students or men in authority, is sincerely respected for his honesty and self-sacrifice. If his tendency as a painter is towards the sombre and the tragic, it is owing to his natural disposition and the lessons he derived from his own struggles. He was never fortunate in winning the Prix de Rome or any of the great prizes of the Académie; indeed, we believe his circumstances never allowed him an opportunity to compete for them. But in addressing the students who were about to depart for the Villa Médicis, he did not, like some of his contemporaries, refer to his own success as evidence that a sojourn in Rome was not needed for the perfecting of an artist. He anticipated that like students during the last three or four centuries, the latest representatives from France could not escape becoming enthusiastic to an extent that was oppressive, and he told them to avoid resisting the power of the place, although they become sufficiently intoxicated as to imagine that masterpieces were to be seen everywhere. Time would bring a corrective, especially when they sought nature as a guide. M. JEAN PAUL LAURENS had to refer to some of the losses of the year. One was the architect GEORGES COQUART, who had won the Prix de Rome, another the painter BENJAMIN CONSTANT.

After the distribution of prizes it is customary to read a paper on some French artist who has lately passed away. This year the subject was JEAN ALEXANDRE FALGUIÈRE, the sculptor, who had attained all the honours open to French artists, Prix de Rome, medals of all degrees, high rank in the Legion of Honour and membership of the Académie des Beaux-Arts. He was the son of a mason and was born in Toulouse, a city which has produced many artists. He gave signs of promise and the municipality sent him to Paris. At first he was not disposed to scorn delights and live laborious days. But all his



associates recognised his power, however latent it was to himself and the masters. At length he exerted himself and carried off the Prix de Rome. He was able to combine toil and pleasure in Rome. With his southern temperament and susceptibility to pleasure it was not to be expected that he should devote himself to melancholy subjects. In 1864 he startled the Salon by the animation of his *Cock-fighter*, a young fellow in a state of excitement bearing his feathered victor on one of his arms. It won a médaille for FALGUIÈRE. His *Tarissus*, a young martyr, was in a different style, and was also awarded a medal in 1867. Then was displayed his capability to treat any sort of commission. He produced busts of many modern celebrities, old and young. *Eve*, *Diana*, *St. Vincent de Paul* were each successful expressions of an idea. The allegoric was also attempted in his *Progress overcoming Error*.

The Académie des Beaux-Arts may well rejoice in the success of FALGUIÈRE. He was a representative of the system. Having won his way through French schools, he was able to turn his knowledge to account in the production of works which are not likely to be soon forgotten. There was no sign of any decay of ability, and the country was justified in assuming there would be many more fine works from his hand. One at least was indicated, a quadriga to represent the glories of the Republic, and which should surmount the Arc de l'Etoile. FALGUIÈRE has had successors, and while such artists are forthcoming the Académie des Beaux-Arts will continue to be a luminary towards which the eyes of artists will be directed from all parts of the world.

### FORMAL GARDENS.\*

THE conduct of life was aptly compared to gardening by IAGO in one of the few moments when he was inspired by honesty. According to him, "Our bodies are gardens, to the which our wills are gardeners; so that if we will plant nettles or sow lettuce, set hyssop and weed up thyme, supply it with one gender of herbs or distract it with many, either to have it sterile with idleness or manured with industry, why, the power and corrigible authority of this lies in our wills." The obverse of his proposition is no less true, for we can consider gardening as the education of the ground, some would say the dandying of it. Left to itself the earth is likely to produce nothing but "hateful docks, rough thistles, kecksies, burs, losing both beauty and utility." But when properly controlled the rankest land can become an Eden. It needs, however, toil that never ends. Just as MICHEL ANGELO was always studying or trying to improve himself, the garden must be subjected to continual and systematic efforts, or all the labour expended on it will become useless.

Every garden which is worthy of the name has, therefore, a historical or biographical interest. The condition of the garden represents not only the lapse of time but continuous attention on the part of its owners. It is not sufficient to create a garden, as is done with pictures and statues; the appearance must be conserved with a watchfulness which surpasses that required even in buildings. A garden thus becomes a memorial of constant efforts to uphold order and beauty by endeavouring to turn nature against itself. We suppose it was on that account so many warriors, leaders and statesmen have found delight in the operations. Enough opposition was offered to excite what was left of their combativeness, and the necessity of law and government was exemplified daily. The description of the old AERTES, who once conquered Nericus, as given in the *Odyssey*, is applicable to many an English warrior in our time. As his son ULYSSES said to him—

Thy garden thrives; I mark  
In all thy ground no plant; fig, olive, vine,  
Pear-tree or flower-bed suffering through neglect,

in other words, every part was marked by the effects of discipline. The "ruddy nymph of gardens" has enticed great men in all ages to her pleasant service.

One of the causes of the delight which is found in turning over the pages of Mr. INIGO TRIGGS'S "Formal Gardens" arises from the majority of them exemplifying the influence of time, an agent which is indispensable for the production of a perfect garden. Montacute dates from the end of the sixteenth century. The garden of Canons Ashby, "originally made in 1550, was altered about the year 1708, but has since defied the changes of fashion, remaining practically the same for nearly 200 years." One at Longford Castle dates from the end of the seventeenth century, although some transformations have been accomplished. One of the gardens of Wilton House was laid out by ISAAC DE CAUX about the middle of the seventeenth century. The Dutch Garden at Levens Hall is described as "probably the most perfect example remaining in England of a garden designed under the Dutch influence prevalent soon after the accession of WILLIAM and MARY." At Brickwell, Sussex, "the gardens present the same appearance as they have done during the last two centuries." There are many other gardens introduced in the work which have antique repose, and the contemplation of the views in consequence becomes almost a sedative for those who have to toil far from such scenes.

In the last and final part of the work there is no deviation in the attractiveness of the plates from those which have been published. The Terrace Lower Garden, Montacute, becomes an admirable foreground for the mansion. The balustrading is of similar form to what is seen around the roof, and by its lightness suggests its ornamental character. The leaden images of amorini from Wilton House are admirably modelled. The Privy Garden, like much else connected with Hatfield House, appears to be unchanged by centuries. A general view is obtained of the Italian garden at Bowood, in which architectural lines are dominant. Examples of rose gardens are given from Rockingham and Boughton. In Bridge End Gardens at Saffron Walden massive borders and egg-shaped trees are seen. An alcove walk and yew garden from Orley Hall reveal other varieties of formality. The Long Walk at Belton House, Grantham, is partly a restoration, but the treatment is refined, especially in the contrast between straight and curved lines, with a fine wood outside the garden. The rosery is in front of a conservatory, and has a central pond with a rose walk around. The view of the topiary work at Levens Hall was taken in winter, when the quaintness of the subjugated trees becomes more marked. The garden at Brickwell is not attached to any great mansion, but those who laid it out made a model of it. On one side of the flower garden is a fishpond with grassy sloping sides. The yews are cut as cones and there are thick hedges of yew. Westbury Court has a garden so truly Dutch that canals or water pieces have been excavated, "one in the form of the letter T; the other a straight piece 450 feet long by about 22 feet broad, at the end of which is the quaint two-storey garden-house supported on columns, now incorporated in the new building." Holland House still retains its Dutch garden, which was, however, formerly of less area. One of the plates shows the gateway in the fore-court. This is an interesting composition. According to HORACE WALPOLE, "STONE in 1629 undertook to build for the Earl of HOLLAND at Kensington two piers of good Portland stone to hang a pair of great wooden gates; the estimate of the piers (which were designed by INIGO JONES and are still standing at Holland House, though removed to a greater distance from each other) was 100*l*." The present iron gateway is rather small, and the piers seem excessive, but they are of fine form, Tuscan in style, and on one side are approached by steps, carried by an arch over the water of a fountain.

In addition to Mr. LATHAM'S fine photographs there are a great many careful plans by Mr. INIGO TRIGGS. As a supplement to the descriptions we have chapters on garden-houses, dovecotes and pigeon-houses, gate piers, terraces, knots and parterres, topiary work, garden lead-work, stone vases, sundials, fountains, stone balustrades, wall gateways and mazes. All are amply illustrated. It will be evident that Mr. INIGO TRIGGS has prepared a work which for the architect can be considered as an encyclopædia, for it contains sufficient information to enable gardens to be laid out and adorned in the styles which have been most popular in Great Britain. To some

\* *Formal Gardens in England and Scotland: Their Planning and Arrangement, Architectural and Ornamental Features.* By Inigo Triggs. Illustrated by 72 Plates from Drawings by the author, and 53 reproduced from Photographs by Charles Latham. London: B. T. Batsford.)



extent there has been a prejudice against formal gardens, for it was supposed they were opposed by their nature to the features of landscapes which are credited as arrangements of nature. Uniformity and regular divisions came to be considered as indispensable. A glance at the plates will convince the most sceptical that every fine type of formal garden can gain by having nature in an uncontrolled state for a contrast. One supplements the other. In the formal garden we see the variety, unity, regularity, order and proportion which some philosophic writers have held to be essential to beauty. There are gardens without all those qualities which are gratifying to the eye. Which is preferable for adoption we are not called upon to decide. It is sufficient to say that in the scenes placed before us in "Formal Gardens" we have materials for giving delight to the eyes as well as for raising associations of an enjoyable kind. The work is a worthy addition to the noble series devoted to English work which Mr. BATSFORD has initiated and continued in the manner of an enthusiast rather than of a publisher. The volume is dedicated by special permission to the QUEEN.

#### MOTTOES ON BUILDINGS.\*

IT is impossible to say when the art of writing was first practised, but it may be assumed that from an early date men were not satisfied with the use of materials for their lettering which quickly decayed. Recent discoveries have revealed that slabs of clay were used in Assyria as records for simple transactions in buying and selling, and permanence was consequently given to "small-beer chronicles." It must have seemed so remarkable that thoughts could be expressed by means of written characters, we need not be surprised at men endeavouring to force some knowledge of themselves on posterity. The foolish people who still degrade walls and seats by cutting names and dates on them are only following precedents which are as old as civilisation.

The Egyptians were evidently systematic in their use of inscriptions. It is not to be supposed that more than a fraction have survived the vicissitudes of centuries. But those remaining have helped to fill in with detail the outline found in the fragments of MANETHO. MARIETTE and LEPSIUS have restored dynasties. BIRCH was able to produce a record of the splendour of the monarchy at the beginning of the eighteenth dynasty by means of the lettering on the walls of Karnak. Apart from the annals in stone are others which, as indicating modes of thought, are probably of higher value. The mystery of time was subtly suggested by the inscription on the Temple, or it may be the statue of Isis:—*I am all that is, or has been, or shall be, and the veil which is over my face no mortal hand has removed.* The Egyptian language was well adapted for expressions of that kind. It was different with the Romans, for their temple inscriptions especially are of the simplest, and at the most laudatory of some emperor. The same succinct manner is seen in the inscriptions on tombs which are found not only in the catacombs of Rome, but in other parts of the Empire. Examples are to be seen in some of the French provincial museums. Not only Roman lettering, but a Roman style was employed up to the twelfth century.

There are so few examples existing of the great buildings and houses of the pre-Gothic period in Europe, we cannot be sure of the extent to which inscriptions were employed in them. When we find DANTE giving one which in his vision he saw on the entrance to hell, it is evident he was only introducing a feature which was familiar to the Italians of the fourteenth century on entering one of their cities. Indeed, it is maintained that Italian is as well adapted for lapidary compositions as the more ancient Latin. In DANTE's time inscriptions were a necessity. CIMABUE and other artists considered it becoming as well as useful to introduce a text relating to a saint or historical figure on a scroll or ribbon, which appeared to proceed from the mouth of the individual represented. Under varying conditions the practice continued for a long time. One of the latest examples is

found in the painting of *Magdalen at the Feet of the Saviour* by PAUL VERONESE. Two angels bear a scroll on which the words appear *Gaudium in celo super uno peccatore poenitentiam agente*. NICOLAS POUSSIN, who was a learned painter, was in favour of inscriptions on pictures. It was no doubt with his approval that the engraving of his *Testament of Eudamidas* supplied a copy of the will, as it is found in PLUTARCH. In his *Arcadian Shepherds* he introduced an altar, on the face of which was engraved *Et in Arcadia ego*, words which have become proverbial among artists and poets. Ever since attention has been given in France to the use of inscriptions, especially with sculptors and architects. FALCONET was supposed to have attained classic simplicity when he employed no more than the two names, *Petro I., Catharina II.*, on the rock which serves as a base for the equestrian statue of PETER THE GREAT in St. Petersburg.

English gentlemen who had made the grand tour could hardly fail to believe there was appropriateness in having their family motto or some pithy or suggestive saying inscribed on their mansions. Sometimes they were so enamoured of wisdom, they were introduced in several parts of the building. The Gallery of Gorhambury, erected by Lord Keeper BACON, abounded in Latin inscriptions. Loseley, near Guildford, which was visited by Queen ELIZABETH, and belonged to the MORE family, contained several, including some which were of the punning variety, as *Morus tardi moriens morum cito moriturum*. In the hall of Farnham Castle is an example of the same kind, *Au Dieu foy, aux amis foyer*. Hospitality as an English virtue was repeatedly suggested by such lines as

*Through this wide opening gate  
None come too early, none return too late,*

or the more familiar *Welcome the coming, speed the parting guest*. But a hint was occasionally given to guests as in the Harleyford inscription, *If thou speakest evil of thy neighbour, come not nigh the door of this house*.

A vast difference is to be observed when Scottish inscriptions are found. They are more stern and ethical, often more cynical. We are not aware of any house which announces that *All things come to the man who can wait*, but the same meaning was conveyed by an inscription which was formerly over the door of a house in the West Bow, Edinburgh:—*He yt tholis overcommis*. Another sententious piece of wisdom was deciphered by ROBERT CHAMBERS in the Cowgate, viz. *Gif ve deid as ve sould, ve nicht haif as v vald*, which means, "If we did as we should, we might have as we would." The words were supposed to be cut about A.D. 1500. Some resolute reformer who declined to follow the beaten track must have inspired the inscription once found on a stone of the wall of Marischal College, Aberdeen, *Thai say: quhat say thai, let them say*. The words found over the gate of Craigievar Castle are known and accepted wherever Britons are found, *Doe not waiken sleipng dogs*, a warning which is still acted on in many an affair. The Irish gentry were not much disposed to have sentences engraved on walls or gateways. Those which are recorded are generally apocryphal.

We are told in the book under consideration that "in the German-speaking countries of Europe we find a richer collection of house mottoes than anywhere else, and decidedly of a higher religious type." The following is an example:—

*Dies schöne Haus ist Sand und Stein;  
Wie werden die im Himmel sein?*

The Italian mottoes are likely to be in many cases derived from older inscriptions. That on ROSSINI's house in Bologna is a paraphrase of two lines of VIRGIL in the sixth book of the *Aeneid*:—

*Necnon Threicius longa cum veste sacerdos  
Obloquitur numeris septem discrimina vovum.*

(Moreover, a Thracian priest with long robe utters in numbers the seven distinctions or notes of the voice.)

Another was taken from CICERO:—

*Non domo dominus sed domino domus.*

It should have been mentioned that the Casa Rossini was built in 1825, during the composer's absence from Bologna. He was much annoyed at the number of Latin

\* *House Mottoes and Inscriptions: Old and New.* By S. F. A. Caulfield. (London: Elliot Stock).



inscriptions which were painted and gilded without his sanction, and he intended to have them all effaced. But his natural love of ease prevented him carrying out his decision. ARIOSTO'S motto on his house in Ferrara is one of the most apt, and suggests that although poor he was not indebted to anyone for the purchase of it:—

*Parva, sed apta mihi, sed nulli obnoxia, sed non  
Sordida, parva meo sed tamen ære domus.*

The existing inscription is only a copy. Above it was a more pompous inscription by the poet's son:—

*Sic domus hæc areosta  
Propitios habeat deos olim ut pindarica*

The suggestion of a resemblance to the house of PINDAR had the effect of preserving ARIOSTO'S, and in that way an inscription was of use. JOHN MILTON, when the attack was to be made on the City in 1642, hoped to have his house secured by means of a sonnet, in which he appealed to the captain or colonel or knight-in-arms:—

*Lift not thy spear against the Muse's bow'r,  
The great Emathian conqueror bid spare  
The house of Pindarus, when temple and tow'r  
Went to the ground: and the repeated air  
Of sad Electra's poet had the pow'r  
To save the Athenian walls from ruin bare.*

But among Italian inscriptions there is not one more suggestive of welcome than that in the grounds of the Villa Borghese at Rome, *Ito quo voles, carpito quæ voles, abito quando voles.*

It would have been an advantage if Parisian mottoes had been included. The writer of the book says:—"I have scarcely any mottoes collected in Paris, and with the omission I may be to blame." Some modern writers have invented and adopted ingenious examples. What can be more amusing than JULES JANIN'S line from BOILEAU on his little chalet,

*Qui ne sait se borner ne sut jamais écrire,*

especially when it is remembered that JANIN was volubility personified? He had three inscriptions on the building. In the same district are other residences which express apt allusions. There is less courage in England, but the examples given in the interesting volume on "House Mottoes" may help to revive a practice which was once familiar in this country.

### SOCIETY OF ARCHITECTS.

THE annual meeting of the Society of Architects was held yesterday evening, when the following address was delivered by the president, Mr. Silvanus Trevel:—

Gentlemen,—Another year has rolled round, and the first duty incumbent upon me is to thank you most sincerely, as well as those who cannot because of distance or otherwise be here to-night, for the kind way in which you have "one and all" unanimously reinstated me in the chair, which under the constitution of our Society I had vacated.

My time, as you know, gentlemen, is very fully occupied, and I have a great distance to come to attend your meetings, but I felt that such a splendid proof of confidence on the part of those who I can see around me to-night, and the many more of our hard-working, busy, professional brethren all over the kingdom, was a vote that had necessarily to be treated with the greatest respect, and that it was again my duty to place such humble services as I may be able to render at the disposal of the Society and its various members for the coming year.

This will be best done by at once recognising the untiring labours of those with whom I have the good fortune to be associated in the Council. There are the vice-presidents, Messrs. Thomas and Pye, indefatigable in their efforts to promote our welfare, and always ready to step into the breach when your President may be absent. Then there is our well-tried honorary secretary, Mr. Ellis Marsland, ever on the alert to serve the interests of the Society or the profession generally, no matter in what form it may present itself—now, registration; next, a difficult question between some member and his client; then the overbearing exaction of some little local building committee who probably have never had an architect's job before, and are not likely to again, and, lastly, how to turn the corner with the very last of the several London authorities that an architect makes the acquaintance of in carrying out the most trivial work. Often I am inclined to exclaim, What should we do without Mr. Marsland? Then comes Mr. Quartermain, whose careful guardianship of the purse has enabled us to put something like 600*l.* to our reserve fund during the past year. Next there are Messrs. Mallett, Cooper, Jennings, Dyson and others of the

Council, ever ready to travel long distances and to give the Society and its members generally the benefit of their advice, based upon long years of matured experience. We have also in our secretary, Mr. McArthur Butler, a gentleman devoted to the interests of the Society, as well as to the welfare of the profession generally. It therefore becomes a very pleasant occupation to carry on the proceedings of the Society, which may in some measure account for the success it is steadily attaining.

I do not propose to detain you so long on this occasion as I did under similar circumstances last year, because on looking through the published copy of that address in the *Magazine* I find that most, if not all, of the points I put forward then stand with even greater force to-day, and should still be objects of our solicitude in our corporate capacity. "Education, qualification and registration" are as much wanted now as then, and upon these, as our watchwords, should our eyes be steadily fixed.

There is the same necessity now as then for this Society to keep a vigilant eye upon the business aspects of the profession, as the many difficult questions referred to the Council by distant members during the past year have shown. Still complaints reach us of wholesale plagiarism, not in the surveyor's departments of our larger municipalities, but in the smaller ones, until serious proposals are made to alter local by laws in such a manner as shall be a protection to the building-owner's architect. There are just the same difficulties experienced now as then in the intricacies of the ancient light and air question, with, if anything, so many more good schemes of development and public and private improvements pigeon-holed, because in the absence of some preliminary appellate court, the attempt to put them into operation might involve ruinous litigation. Dabbling charlatans are just as rampant as ever, and will not be suppressed until a duly recognised legal status is given to our profession. Each American and Continental State in turn adopts registration, and most of our Colonies, but here we are in the unique position of having a section of the profession itself opposing it. Municipal improvements are proceeding in all directions, some wise, some otherwise, especially those connected with the development of electrical energy, which threaten to produce in many of our more crowded cities abominations to architecture second in degree only to the excessive and vulgar advertising inflicted upon us. Owing to our short lease system of tenure for building sites our buildings themselves are not nearly so solidly constructed as in countries where either freehold, or very long leasehold and perpetual feu obtains. These were points referred to by me in detail last year, and I think you will all admit that they are just as pregnant and pressing to-day.

Above all others presses the registration question, particularly to the provincial architect. Wherever one turns, especially in the provinces, this is the first question asked by architects, What is being done in the matter of registration? They are tired of having repeated statements of facts and arguments in its favour, and of what has been done elsewhere. Their minds are thoroughly made up upon the subject. "What we want is the statutory registration of all duly qualified architects, and we look to the men who occupy representative positions in both central and local societies to do their best to procure it for us." This I am hearing wherever I go, and it appears to me to be wasting both time and energy to deliver another address on the subject to convince men already convinced. What is wanted is to be agreed on the details of the proposed measure, and then to actively take the necessary steps for its promotion in Parliament.

It has been said that the promoters of the Bill that has already been before Parliament intended to have constituted themselves the arbiters of who should and who should not be admitted into the profession under the system of registration then advocated. If those making that statement would only take the trouble to study the draft they would find that not only did its promoters not do that, but they provided for the different recognised representative bodies to be adequately represented on the Council, with a preponderating influence to the Royal Institute, who were to have been made the examining body to pass the qualifications of all future admissions under the proposed measure. I mention this as it was not many weeks since a very distinguished architect gave me this as his reason for objecting to the Bill.

This is merely a sample of erroneous impressions that have existed in the minds of some who have been perhaps biased. It would be well therefore if all those architects who have not already seen a copy of the Bill procured one and made themselves fully acquainted with its contents. As it has now been before the country for several years, it is quite possible that some of its details may require modification, but to a dispassionate mind I feel certain it will be regarded as a *bona-fide* attempt to remedy the evils from which the profession and the public now suffer.



It has been remarked that the senior members of the profession have not been particularly enthusiastic on the subject, because they have already all, and perhaps more than registration is likely to give them. That may be so, but is it a good reason for obstructing registration, or denying to the younger men the opportunity of raising the status of their calling? I am not a young man myself, and may not live to get any benefit whatever from registration, but I wish well to the younger men—the rising generation of architects, who will have to carry on the work when we have passed away, and am desirous of assisting in this movement, which will unquestionably tend so greatly to their benefit. I commend it therefore to every architect in the kingdom, be he occupying a representative position or not, to do all he can to support the projected measure. Every one can do his part, and registration in law or medicine, chemistry or dentistry was not carried until many years had been spent in untiring efforts, during which the public at large were convinced that proper qualification and statutory registration were necessary for those professions, and are now participating in the benefits that accrue from what was enacted.

By the kind courtesy of the President of the Institute of Builders I lately attended the annual banquet of that very influential body, and found there was still irritation upon the subject of a standard form of building contract that had formed the subject of discussion between themselves and the Royal Institute of British Architects from 1886 to 1900. It appears that in the latter year a form was agreed upon that was acceptable to both parties. This recognised the right of a contractor to claim under the arbitration clause for any materials used by the architect's instructions of a more costly description than what was specified. This was accepted by the Council of the Royal Institute, but thrown out at a subsequent general meeting of that body, to the great disappointment of the builders. The equity of the builders' proposal seems so apparent that it is much to be regretted that the question cannot be reopened, and the cause for such friction be once and for all removed. I say distinctly that I would never call upon another man to sign what I should refuse to sign myself were our positions reversed, and that either of us should subject ourselves to the absolute dictation of anyone to put what construction he pleased upon the meaning of a specification without reference to arbitration is more than can be expected.

Much I observe has lately been said upon the subject of the education of architects, and in one or two instances only metropolitan and one or two large provincial centres have been mentioned as suitable for that purpose. It must, however, be obvious that all our architects of the future will not be exclusively drawn from these few points, so that it becomes important with the placing of our secondary and higher education on a sounder footing throughout the country, that the claims of our profession should not be overlooked, and that those intending to follow this pursuit should have the opportunity of being grounded in at least all that appertains to the elementary study of the subject in all schools receiving Government aid for technical instruction.

Competitions I notice, too, have come in for a good deal of comment lately. Much has been said about the steps taken to insure, so far as possible, fair conditions and just results where they have been resorted to. Regret has been expressed that there should be occasion to resort to them to such a large extent as now appears to be the case, and often upon the most trivial class of work, where a building committee would be far better served if they put the work in the hands of an architect whom they could trust. But are we not sure that the steps taken to mitigate the evil are sometimes producing it? I observe that a statement was recently made that not only were "conditions of competitions" sent to public bodies who had already decided upon a competition, but also broadcast all over the country to every public body that might sooner or later have architectural work to do. Now, are we quite certain that this is in the best interests of either the profession or the public? Without doubt it suggests competition for everything, and practising architects know very well that many things are now put to competition that there is really no excuse for, and that the building owner himself or themselves would be far better served had they taken a responsible and experienced member of the profession into their confidence at the start, and carefully evolved the best solution of the problem according to their requirements. This wholesale scattering of "suggestions for competitors" is gradually teaching every little building committee to believe that it is just as essential to advertise for plans as it is for tenders, and they are frequently foolish enough to suppose that the one does not involve a greater sacrifice to the competitor than the other, whereas the ratio of expenditure is about twenty to one to the victims of the system. I have really been pained beyond measure when I have seen the enormous amount of money and labour expended by architects upon fruitless competitions, and often with the additional wrong of seeing many of their original features plagiarised in that or some subsequent work.

Last year I was taken up rather severely by some representatives of the Press, and very kindly treated by others, because of my criticisms upon London, its streets and general want of method in laying out. I have again read what I then said, and have nothing to retract. I have lately visited Berlin, where the improvements being carried out in all directions make those of London appear very small and insignificant by comparison. And although Berlin is not altogether free from the advertising fiend, yet he is checked and controlled there in a manner that makes it comparatively inoffensive by the side of what we have to tolerate. In fact, in our chief centres, metropolitan and provincial, this craze for big letters and vulgar advertising is becoming so rampant that it will be a complete waste of time and money to design any good architectural features. If our civilisation continues to develop in the direction it now appears to be taking, the street façade of business premises will be as near an approach as can be got to a railway station wall with a hoarding. Why can not there be municipal by-laws subordinating these horrors to local control as much as for other things which offend the senses less?

It is a matter of great satisfaction to observe the improvements that are progressing in the eastern Strand and thence to Holborn. As these develop, so will public appreciation of them be intensified, especially if care be taken by the County Council to regulate with some regard to fitness, symmetry and proportion buildings that may be in juxtaposition to each other. Already the clearances, opening out the façades of existing buildings, show the observant what would be the effect could some of London's best buildings, jammed away in narrow alleys and back streets, be only so opened up.

In Whitehall, too, two stately blocks are rising, only to show what a grand opportunity was lost when the late Sir Charles Barry's scheme was abandoned, as well as to show how narrow and insignificant the neck of the bottle towards Trafalgar Square will look when these are finished.

It was a great mistake in the history of the Metropolis to have ever abolished the small duty on coal and wine that provided the funds for such a grand improvement as that of the Thames Embankment. If those two small imposts had continued there might have been by this time many more of such improvements, and no one would have seriously felt the tax, whilst all would have benefitted by its expenditure upon objects of this kind. We have, however, now new local municipalities all over the Metropolis, with more extended areas than the old vestries, a stronger and keener individuality, with probably a *personnel* with a higher standard of intelligence and taste. Let us hope that they will make the best use of their opportunities, and that this London of 1902 may have improved as much in the next decade as it took at least three decades before to accomplish.

Much will depend, too, upon their officials, and among them will be, I hope, what it appears from the opening address of Mr. Alfred Darbyshire, the worthy president of the Manchester Society of Architects, has been recently established in that progressive municipality, a "city architect," whose duty it will be to advise the Corporation upon all such questions. With a city or borough architect for each metropolitan municipality to advise the several corporations upon questions of public taste and public improvement, with a few well-considered additions to the by-laws in the matter of signs, advertisements, and chimney-stacks, this Metropolis of ours would soon begin to be more endurable, and assimilate more nearly with those places on the Continent where such matters are kept within reasonable control.

We have, too, our County Council, that the Legislature no doubt intended to act as the central controlling body, and when the new "Hôtel de Ville" of London rises from some conspicuous position on the banks of the Thames, let us hope that it will contain the accommodation for the proper display and careful consideration of all schemes for the improvement and beautification of the Metropolis, where the members and the officials of the subsidiary municipalities may confer, and so utilise the machinery that Parliament has created for making London gradually a harmonious whole.

In the provinces the two architectural works that stand out just now perhaps more conspicuously than any others are the two cathedrals. One, Truro, just approaching completion; the other, Liverpool, just in the throes of the second competition. Truro is now so far advanced that we can pretty well realise what the effect will be when the scaffolding and hoarding come down. Future generations will, I think, recognise in it one of the most perfect specimens of Mediæval art in the kingdom, the architect of which had the opportunity of designing a complete edifice, though unfortunately not to witness its completion. The name of Mr. J. L. Pearson, R.A., will go down for all time as one of our most skilful Mediæval architects, and the building, though of course not nearly so large, will take rank alongside of Lincoln or Salisbury for artistic merit. In its planning and in the grouping of its various parts, whether externally or internally, it will always preserve its



identity as a striking Mediæval cathedral church with an individuality of its own. It is a pity that for economic reasons some of its most prominent mouldings are executed in a soft stone, where from greater exposure to atmospheric conditions it is bound to decay first, but it will outlive this generation and possibly this century, when those who come after will have a comparatively light task to renovate it, if compared with that undertaken by the generation now passing away who put it there.

Of Liverpool we can say little yet, only await with great curiosity the design finally selected. When that appears it will be a matter of great interest to observe how far a modern cathedral for a great population like Liverpool departs from the old-established lines of Mediævalism.

But we cannot all be designing and building cathedrals, so in conclusion I will get back again to the commonplace everyday side of our profession by saying that there is work of some sort for every one of us to do. Let us do it well, honestly and conscientiously, producing the best result that is possible with the means at our disposal. Let us by all means in our power keep up the prestige and esprit de corps of our profession, then we shall earn the respect and confidence of our clients, and if we don't make large fortunes, shall, I hope, make respectable livelihoods and be considered worthy members of society.

### MANCHESTER SOCIETY OF ARCHITECTS.

A MEETING of the Manchester Society was held on the 13th inst., under the presidency of Mr. Alfred Darbyshire, when sixteen sets of drawings were on view, submitted by students in the competitions organised by the Society. The President read out the list of prize-winners as follows:—Sketches in connection with the Society's summer visits to old buildings: First prize, Mr. Frank Dyer; second prize, Mr. H. B. Laycock. Measured drawings of old work: First prize, Mr. R. J. Vernon; second prize, Mr. G. S. Salomons. Essay on the Renaissance in England: Mr. Spencer H. Oldham. Monthly classes of design, the subject being a row of eight small houses: First prize, Mr. Harold Hill; second prize, Mr. Frank Osler.

A paper was read by Mr. Halsey Ricardo on "The Revival of Gothic Architecture." In the course of it the author said that Mediæval architecture was the expression of a popular enthusiasm for building which went hand in hand with the piety of the people. It was popular and it was sincere. The architecture of the Renaissance was individualistic; it was not popular; it was infidel and insincere. The Mediæval churches and cathedrals were raised by guilds of craftsmen assisted and furthered by the people around them. Architecture became dependent upon great patrons who supported it from without, when it had previously been inspired from within, and with this change all the arts became an inexplicable cult for the rich and the leisured; the craftsman only co-operated in ignorance and without heart. Of the architect leaders of the Gothic revival in the nineteenth century Mr. Ricardo named Pugin, Street, Burges and Butterfield. Before Pugin's time, broadly speaking, such Gothic architecture as was being produced was Gothic in seeming only. That the author of the Waverley novels should inhabit a Gothic structure at Abbotsford was but natural and proper; nay, it was almost incumbent upon him, as well as consonant with his taste, and Mr. Blore, his architect, was ready to fall in with so amiable a whim. So various territorial magnates considered that it was due to their ancestry that they should be living in Middle Age castles, and therefore they transformed their Georgian dwellings into battlemented, machicolated imitations of the defences of the barons when war raged throughout the land. But with Pugin a deeper note was struck. For him the Middle Ages contained the true gospel, the Roman Catholic religion, the true faith. He set himself to reproduce the conditions of past times, old methods of life, old methods of construction. He saw well enough that to effect this properly he must reproduce the Mediæval workman, and, so far as he was able, he established workshops and schools in which to train his men. To us now, with our extended sources of information, the learning of Pugin did not seem so colossal as it appeared to those of his own day, whilst the substitutes and imitations of the real effects that he was trying to reproduce abated in us something of our esteem for his sincerity. But through his work breathed a spirit of lofty piety that kindled and purified what he did. The work of an ardent, beautiful soul, it stood a possession to us, the record of the ferment and the passion of the mid-century, and made valuable by the quantity of noble feeling it contained. Street was also passionately in earnest, but on him was more thrust the weight of modern conditions. The churches he built were for Reformed congregations, and though he and his school of thought tried to some considerable degree to ignore these reforms, yet there was much that had to be accepted. In his mind he recognised this and desired to accept it loyally, but the spell of the past was on his

heart, and his terrible facility with the pen carried him beyond the limits that he had appointed to himself. The attempt to recall features that once had life and bid them live again because they were endeared to us showed itself in the great hall of the new Law Courts. When that design was clubbed and bludgeoned down by the Government into less than half the area that it properly and originally demanded, it was clear that the attempt to preserve the hall was a fond one, and that in good sense the hall should go. The hall was built to the cruel detriment of the comfort of the Courts, the great vaults hang over it gloomy and deserted. It was his heart's darling whilst he lived, and now that he is dead it serves mainly to guard and enshrine his monument. In William Burges they had another temperament, and in the main cast of it far more Mediæval, and "there is a kind of sunny laugh in the buildings that grew up under his hand." Burges carries us back to the days of the "Decameron," and puts one amongst Boccaccio's audience. One was startled to find how vivid and real the dream is. He picks up the tools of the Mediæval craftsmen with an echo of the laughter of hundreds of years ago, and works his stone with so convincing an air and so much humour that it surely must be quickened into life. Burges had the power of transfusing himself among his craftsmen. His sculptors and painters kindled at his ideas and played up to them. Burges told us of doughty deeds and perils 'scaped, of damsels under enchantment, of wizards overthrown; we had "Ivanhoe" and "The Talisman" over again in terms of stone and painting. The last name in connection with the Gothic revival was that of Butterfield, and it was his special and lasting merit that he was more than a revivalist architect. He studied the Mediæval buildings with a closer and deeper analysis than Pugin, and with a greater reverence than Street, and set himself to build for the necessities and ritual of the present day, using the Gothic vocabulary as his mode of expression. But there was no co-operation from his workmen—everything was settled down before the work was begun, down to the last detail, and no growth was permissible beyond what had already been foreseen. But he knew his materials well, what they had done, and what they could do, and throughout his work they have a contented air, widely different from the usual tired look that most walling has. The canons of taste, Mr. Ricardo said in conclusion, were now clamouring for simplicity, showing how tired we had got of the trapping and upholstery of past styles, and how insufficient they were to hold our interest after their novelty had worn off. In this simplicity lay our hope that we might touch the heart of things, take our problems loyally and frankly and try to work them out in common sense, using our knowledge of construction to further our powers of design, not to cramp them by enabling us to raise buildings of impossible appearance, and our knowledge of what had been done in past time to be our guiding spirit in respect to the aims, the methods and the piety of the master builders—our forefathers.

A vote of thanks was passed to Mr. Ricardo for his address.

### FERNS CATHEDRAL.

THE Cathedral of Ferns, which for the past year has been undergoing a thorough restoration under the direction of Mr. Fuller, architect, has now been reopened. The original structure, erected about the end of the thirteenth century or beginning of the fourteenth, and built on the site of the ancient Oratory of St. Mogue, the first Bishop of Ferns, to whom it was dedicated, was evidently one of imposing proportions and great beauty, with nave, aisle, choir and chancel. In the fifteenth and sixteenth century the cathedral suffered much: Bishop Kane found it in ruins, the nave or centre aisle only being fitted up for Divine service. The nave, somewhat enlarged, seems to have undergone frequent "restorations," in which every trace of the original building was gradually obliterated, the tracery of the walls ruthlessly broken, the beautiful clustered pillars which supported the arches between nave and aisles built up into the walls and plastered over, so that it was generally thought that no portion of the present building belonged to the original structure. The present restoration has been undertaken in a different spirit. The ancient pillars have been exposed and repaired, and other portions of the original cathedral which were brought to light preserved with loving care. A new chancel arch has been erected, and the prebendal and choir stalls placed within the chancel. The old ceiling has been removed and the roof lined with pitch pine. New seats have been provided, the floor tiled throughout, and a new system of heating by hot water introduced, and many other improvements effected.

The Chapel of the Bishop Otter College, Chichester, was dedicated on Saturday. The enlargement was carried out from designs by Mr. Gordon P. Hills.



## NOTES AND COMMENTS.

THE Court of Appeal appears to be afraid of the inconvenience which may be caused by the mass of details involved in an architect's claim for fees, and therefore will not aid in having the claim heard in court. Mr. HALL, an architect of Leicester, is the plaintiff in an action for the recovery of fees, the defendant being a local builder. One of the Masters made an order that the case should be referred to the Official Referee, and Mr. Justice DARLING approved of that course. The subject was brought this week before the Court of Appeal. Counsel for plaintiff sought to have the action tried in the ordinary way by a judge and jury. It was stated that the question was not one of the scale on which the architect was entitled to fees, but the meaning of an agreement between the parties. The plaintiff put in fourteen items of particulars, and the defendant admitted four of them which were in respect of certain extra work. With regard to the other ten items, plaintiff agreed to do the work for remuneration at the rate of 3 per cent. on the total outlay, and the only question raised in the defence was whether these ten items came within the scope of the agreement at all. Therefore, the question for decision was one of principle, and the case should not have been referred to the Official Referee. What influenced Mr. Justice DARLING in making the order was that there was another action pending by the plaintiff against two co-defendants, one of whom was the present defendant. Both actions were referred, although each related to a different building, and raised totally different questions. Lord Justice ROMER asked whether if the case went before a jury they would have to go into the nature of the work? Counsel, in reply, said the question was simply whether the contract applied to all the work the plaintiff had to perform, and the Official Referee was not the proper tribunal to try such a question. Counsel for the defendant said it was not a bare question of principle, and it would not be fair that there should be two trials, firstly as to the question of principle, and afterwards as to the details. Lord Justice ROMER said it was clear that to allow the case to be tried first at the assizes, and then referred on questions of detail, would result in unnecessary expense. Mr. Justice DARLING was right in referring the whole matter to the Official Referee, and the appeal would be dismissed with costs. Lord Justice MATHEW concurred.

If ever a work of art could be employed as an example of the "Illusions Perdues" of BALZAC it is the statue of the novelist. M. RODIN accepted the commission for the work in the hope of producing a work that would be worthy of so great a writer. He modelled several figures, but not one of them was considered acceptable by the Société des Gens de Lettres. Then with much misgiving the late M. FALGUIÈRE undertook the work, but he did not live to complete it. An arrangement had been made that M. ANATOLE DE VASSELLOT was to execute reliefs representing scenes from the "Comédie Humaine," which were to adorn the pedestal. M. FALGUIÈRE approved of it, and the two sculptors came to an understanding on the subject. The reliefs were exhibited in the Salon. But after M. FALGUIÈRE'S death Madame FALGUIÈRE expressed the desire that the statue of BALZAC should stand on a pedestal from which reliefs that might attract the attention of the spectator away from the principal figure should be absent. The committee have decided to accede to the desire, regardless of the earlier arrangement. M. DE VASSELLOT'S expectation of being allowed to offer a proof of his admiration of BALZAC is therefore at an end, and adds one more to the illusions which the memorial has created.

ALTHOUGH his name denotes an Italian family, M. JEAN RAFFAELLI is a native of Paris. He is likely to associate that name with a new variety of painting. M. RAFFAELLI has discovered a method which will hold a relation to oil-painting corresponding with that of pastel to distemper or water-colour painting. The colours are manufactured in the form of ordinary crayons, although the size is doubled. They are in a medium state, between softness and hardness, and little practice is needed to apply them to canvas or paper. This dry mode can produce effects similar to those obtained with oil colours, and, as far

as the tests go, the durability appears to be equal. Painters may complain that they will not have the satisfaction of preparing subtle combinations of colour by the new process, but M. RAFFAELLI'S exercises with his special paints are suggestive of combinations without number. For travelling painters and for several purposes the new method has peculiar advantages. An exhibition of works produced by the materials will be opened in Paris on the 24th inst., and the pictures will subsequently be shown in London, Berlin and New York.

THE negotiations for the possession of Stonehenge as national property have been renewed. On the invitation of Sir EDMUND ANTROBUS, there has been an interview with him through Lord EDMOND FITZMAURICE, chairman of the Wilts County Council. It is considered to be premature to make any announcement now, but it is anticipated that in February his lordship will be able to communicate the result to the Council. It was recently said that the value of Stonehenge was not included in the proposed sale to the Government of a large tract of land, amounting to several hundred acres, near Vespasian's Camp, for a sum of from 125,000*l.* to 150,000*l.* What occurred was that at the time of the former negotiations there was an entirely separate valuation made of what might be fairly considered to have been the increased value of the Amesbury estate when bought by the predecessors of Sir EDMUND ANTROBUS from the fact of Stonehenge being on the property. This sum was, however, brought within the limit of the above-mentioned 150,000*l.* at the time of the negotiations referred to. When Sir EDMUND ANTROBUS is charged with wishing to sell Stonehenge itself for 125,000*l.*, the statement is not correct. At present there is hope that a satisfactory conclusion will be reached.

## ILLUSTRATIONS.

CATHEDRAL SERIES: HEREFORD. EAST WALL OF NORTH TRANSEPT.

THE TEA HOUSE, REIGATE HILL, SURREY.

THIS has been built upon the summit of Reigate Hill, on the main road between London, Epsom and Brighton, and is much frequented by cyclists and travellers. On the ground floor are coffee and smoking-rooms (with communication to verandahs) and a lounge hall. In order to facilitate serving, the kitchen department is also on the ground floor. On the first floor are bath and bedrooms. In the basement, which is arranged by the fall of the ground so as not to be underground, are well-lighted store rooms, manufactory for mineral waters, and large cellars for storing same; a bicycle-store is also provided. The external walls are hollow and the majority finished with rough cast of a pale yellow tint and half timberwork, tarred to a dark colour, introduced in the upper portions. The chimneys and piers of verandah are in local sand-faced red brick. The porch is lined with Farnley glazed bricks of moss-green colour, and the verandahs with panelling stained the same tint. The columns, on glazed brick piers, at entrance are of English oak, simply oiled, carved on the spot, with the tea flower introduced in the caps. All the wrought-iron work of sign, hinges, barge brackets, &c., were to special design and were executed by local craftsmen. The roof is covered with Maidenhead sand-faced, hand-made tiles of a rich red colour.

Mr. CHARLES E. SALMON, of Reigate and Wallington, is the architect.

BURTON COURT, SLOANE SQUARE.

DACRE HOUSE, WESTMINSTER.

THE GREAT HALL, STATIONERS' HALL, LUDGATE HILL.

NEW PREMISES, TWICKENHAM.

THE builders of the premises we illustrated last week were Messrs. W. H. GAZE & SONS, contractors, of Kingston-on-Thames, the constructional steelwork and fire-proof flooring being by Messrs. A. D. DAWNAY & SONS, LTD., the granitework by Messrs. J. WHITEHEAD & SONS, LTD., lift by Messrs. R. WAYGOOD & CO., LTD., sun-blinds by Messrs. L. W. FRANCIS & CO., LTD., and turret and covering by Messrs. F. BRABY & CO., LTD., the architect, as mentioned last week, being Mr. THOS. R. RICHARDS, of Bedford Row Chambers, 42 Theobald's Road, W.C.



## ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Institute of Architects was held on Monday evening last, Mr. Aston Webb, A.R.A., president, in the chair.

## All Hallows Church, Lombard Street.

The SECRETARY read the following resolution, which was passed by the Council at a meeting in the afternoon:—

"That the R.I.B.A. views with regret the proposed demolition of another of Sir C. Wren's churches, which has a peculiarly successful interior, and desires to express the hope that means may be found to preserve the building intact. But if circumstances prevent this, that the church should, if possible, be re-erected upon a suitable urban site stone by stone, and in any case that the fittings should be suitably rehoused in a building of the same character, where the whole could be brought together so as to preserve the unity of their design."

Mr. F. C. PENROSE read a paper on

## The Origin and Construction of the Ionic Volute.

He stated that several methods had been proposed for the construction of the Ionic volute by means of finding centres for quadrants of circles which may give some approximation to the appearance of the true figure of the Greek originals, none of them very successful. That of Goldman seemed to be the best, but it failed altogether to give the proper proportional expansion of the spaces between the lines, nor did the four arcs in each convolution at all represent the beauty of the continuous gradation of Greek originals. The origin of the volute, sought for in Assyria, Egypt and elsewhere, the author derived from Greece itself, as the scheme he was about to explain enabled the exact figure of any true Greek example to be reproduced. In archaic Greek work, and particularly in the decorations of the Mycenaean period, one constantly found the form of scroll in which every convolution of the spiral followed the first at equal intervals. This decorative scroll had no doubt been formed mechanically, as could easily be done by unwinding a string from a cylinder, forming a figure known as the involute of the circle. The question presented itself, How could a spiral having the character of the ammonite be produced? If the operator drew upon wood—or some other suitable material—the involute scroll, such as he had been accustomed to, and by shallow carving or otherwise raised the edges a little so as to form a helix, and allow a string to be wound round those edges, and then unwound over a flat surface having a marker at the extremity of the string, he would produce the expanding spiral he was in search of. It did not give correctly the figure of the ammonite, but it had all the requisites of proportional expansion and perfect variation of curvature at every point, and coincided perfectly with Greek volutes.

The author gave two examples from Ephesus—the first from the archaic Temple of Diana. In all later examples known to the author the two central convolutions of the spiral, nearly so, were interrupted and concealed by the circle which formed the eye of the volute. In this case, however, the curve which would be evolved from the helix was allowed to extend from the central origin of the volute up to its junction with the abacus. By drawing a straight line through the central origin to the circumference on both sides a calculation could be made to find a helix on the involute principle, and this, when worked out, would be found to agree not only with given points on the circumference, but to correspond with the other convolutions also, and could therefore be extended to the whole of the volute. This correspondence clearly showed that the method of the involute spiral was that which was used by the architect employed by Croesus.

The volute of the later temple at Ephesus, the second example, had almost the same curvature, the only difference being in the surface moulding and the circular eye which occupied its centre. In the majority of the examples known the eye of the volute was a separate piece from the main mass of the capital, and was formed by some kind of boss of marble or metal inserted into a circular hole prepared for it, centred very nearly on the place of the pivot of the helix, and always of sufficient diameter to receive it. Such an arrangement would have had obvious convenience for fixing the helix.

The volutes in all the examples in Asia Minor were probably described by means of helices similar to that mentioned above. But the Athenians demanded greater variety than that spiral so used could supply, and gave to their volutes additional expansion in the exterior convolution; still, however, working by means of the involute form, but differently treated. This applies to the Propylaea, to the three orders of different size in the Erechtheum and to the Temple of Nikè. It was also used in the temple on the Ilyssus, recorded by Stuart, and in the principal temple at Bassæ. With the exception of this variation in the exterior convolution in Athenian structures, the same general scheme seems to have been employed in all true Greek examples, and the only liberty of choice given to the

designers lay in the proportioning of the width of the volute to the upper diameter of the column, and in that of the interval between the convolutions of the generating helix, in the size of the eye compared with that of the volute. This would have some effect upon the number of convolutions to be used, which vary in the cases the author had examined from four (that is, measured from the origin) at Priene, to two and a quarter in the case of the Erechtheum. The intervals of the helix would determine all other variations. The variations in the above-mentioned elements, as found in certain examples, were shown in a table of calculations. The two different descriptions of volute he termed the Asiatic and the Attic.

The author next gave a description of the helix for describing the Greek volute, and detailed the method of its employment both in the Asiatic form and the Attic variation, illustrating by various diagrams and giving a table of calculated measurements. Mr. Penrose proved the accuracy of his method by showing that examples of volutes on the east portico of the Erechtheum and at the Propylaea, worked out in the way he had described and from data given by the table, were found to be in exact agreement with the records made by Stuart of the Erechtheum and by Mr. T. J. Willson of the Propylaea.

Before concluding, the author gave an interesting description, illustrated by diagrams, of the helix (one from which a string may be unwound so as to produce the volute) employed by him in drawing the models exhibited, and suggested the adoption of a similar contrivance where a Greek volute had to be carved.

Dr. A. S. MURRAY read a short paper, entitled

## A Fragment of the Parthenon Frieze.

Before dealing with the subject of the lately recovered fragment of the Parthenon frieze, Dr. Murray mentioned another important find in the same neighbourhood. A year or more ago he received from a clergyman a copy of a Greek inscription on a piece of marble in a rockery in Essex. It turned out to be an inscription which had been missing since about 1771, in which year it was published in the "Archæologia of the Society of Antiquaries." The story was that Stuart, when in Athens preparing the drawings for his famous book, had picked up this inscribed piece of marble, and given it with some fragments of bas-reliefs to a ship captain to take to Smyrna, where he intended to get it on his way home. When, however, Stuart next saw the marble, it was in the hands of a Mr. Jones, of Finchley, who had received the inscription and the fragments of bas-reliefs from a captain in the navy. How long the inscription remained at Finchley is not known, but just about then there was a well-known antiquary, Thos. Astle, much interested in ancient alphabets, and presumably the sort of person who would like to possess the beautifully inscribed stone. At all events, it was on an estate in Essex, once belonging to Thos. Astle, that the inscription had lately been recognised. The inscription is of no little historical interest, being part of a monument erected in Athens in honour of volunteers from Cleonæ who had fought on the side of the Athenians (457 B.C.) in the battle of Tanagra against the Lacedæmonians and Eubœans. Stuart states that he had found the inscription near what he calls the ruins of the Stoa Pœcile or Painted Porch. Some additional fragments have since been picked up in Athens. When the copy was sent it was noted that an important part of the inscription was still missing. Since then, however, a son of the present owner of the estate had found that part in digging round the rockery. Both pieces have now been moved into the house. The larger piece has a bleached appearance from long exposure to Essex weather, but the fragment lately dug up looks as if it might have been brought from Athens the other day. Two or three months ago the gardener, in digging beside the old rockery, came upon what has turned out to be a fragment of the Parthenon frieze. It was first identified as such by a young medical student, Mr. Aliston Glover, who had visited Athens and was familiar with the style of the sculpture. He called upon Dr. Murray with a photograph, which enabled them, together with the exact dimensions, to determine at once the slab in the museum from which it had been broken off. Though found under the earth, the fragment must have been long exposed to severe English weather. Down the face of the sculptured horseman the rain has driven furrows, which take away some of its charms. This fragment does not appear in any drawings made previous to Lord Elgin's time. It had fallen before then, most likely during the gunpowder explosion within the Parthenon in the seventeenth century. The want of any play between the slabs, owing to the excessively fine joints of the frieze, was sure to be a source of mischief should the building be shaken or subside in its foundations. This, no doubt, is the reason why so many of the corners of the frieze are wanting; possibly there may be some more of them in English gardens.

Considering the facts that Mr. Jones, of Finchley, possessed several fragments of bas-relief as well as the inscription, and that Stuart had sent home some such fragments with it, Dr.



Murray was inclined to think that this fragment of the frieze had reached Essex along with the Greek inscription and had been sent home with it by Stuart. Thos. Astle was in his time a trustee of the British Museum. But that was in the pre-Elgin days, when the Towneley marbles were regarded by Dilettanti as the perfection of ancient sculpture. A fragment of the Parthenon frieze would have counted for very little then.

Dr. MURRAY showed a photograph of the slab to which the Essex fragment belonged, which represents a part of the cavalcade of young Athenians who rode in the Panathenaic procession through the streets of Athens every fifth year. A photograph, with the fragment added in its proper position, was also shown. In conclusion, attention was drawn to some specially interesting details of this portion of the frieze, and to the skilful devices employed by the sculptor to avoid monotonous repetition and arrest the attention of the spectators.

Mr. H. H. STATHAM, who proposed a vote of thanks to the readers of the papers, said it would be very difficult to follow out Mr. Penrose's theory from the first reading of his paper. He had shown them how to draw volutes by continuous lines instead of by a succession of circles, and all those who drew volutes were indebted to him. It seemed hard to believe that the Greek volutes could have been developed from a succession of circles.

Dr. C. WALDSTEIN seconded the vote, and he offered his cordial congratulations to Dr. Murray on the brilliant discovery which had been made and to the Institute for being the first society to whom it was made public. They could all measure the importance of finds, not quantitatively, but qualitatively, and though it was but one small figure relatively considering the great mass of figures in the Parthenon, yet the small fragment should be as important as many discoveries of merely decorative works.

Professor BERESFORD PITE said the Institute had unusual reason to congratulate itself for such a communication as they had had from Mr. Penrose. The circumstance was unique. It was very interesting that the little excursion to the Acropolis had been conducted by Mr. Penrose, accompanied by Dr. Murray, and then the exploration in the Essex garden to prove such a valuable and charming treasure added special interest to the evening and to the enthusiasm of the meeting. He expressed the hope that when Mr. Penrose's theory was considered in detail it would not be so hard to understand as it appeared to be from the reading. Mr. Penrose had let slip the remark that what was possible to the good Greek workman was possible to the good English workman, and therefore it would seem that that which was possible to the Greek architect was possible to the English one of later days. If all the wonderful Greek capitals were made by measurements then the old theory that used to be battled, that all Greek curves, because they were beautiful, must have been drawn by the free hand of some architect's pencil, was still assailed. The theory that the architect's pencil had no reason to enter into the work was applicable by what Mr. Penrose had put before them.

Mr. T. BLASHILL and Mr. R. PHENÉ SPIERS supported the vote of thanks.

The PRESIDENT, in concluding the discussion, said modern architects, after what they had heard from Mr. Penrose, must be struck with a sense of feebleness and despair in their own work when they realised that after over two thousand years they were still searching for the secret of one small detail in Greek architecture. They must feel how immeasurably inferior they were in their work to that carried out in those much earlier times. The Greeks attained their refinement through scientific methods, and in modern buildings the rule would also apply; artistic results were not achieved otherwise. With regard to Dr. Murray's paper, they must all rejoice at the discovery of the fragment of the frieze, and their satisfaction would be complete if he was able to tell them that the fragment was to be added to the portions at the British Museum. There could be no doubt that this was the only place where it could be placed.

Mr. PENROSE and Dr. MURRAY returned thanks. The latter said he could say very little as to the Essex fragment. He believed it would go to the Museum, but he would rather not tell its whereabouts in the county.

**Remains of Old Work** have been discovered at Peterborough during excavations for underpinning the Knights' Chamber gateway in the cathedral precincts. About 15 inches below the present level the workmen came upon the ancient wall seat *in situ*. About 18 inches below this was found the original well-worn paving of monastic days. The original level was therefore nearly 3 feet lower than the existing one, and corresponds to the pavement level of old Peterborough, which is often met with in town excavations, and which coincides with the floor-level of the parish church.

## PRESENT CONDITION OF THE LIGHT AND AIR QUESTION.\*

MR. PRESIDENT and Gentlemen,—At the invitation of your Council, I have very much pleasure in acceding to their request to read a paper before you on the much vexed question of light and air, more especially because at the present time recent legal decisions and the actions of the Councils of the R.I.B.A. and Surveyors' Institute have brought this subject under prominent notice, and it is essential that all of us should carefully consider the present position.

I do not propose to go into the physical properties of light, as these are so familiar to us all.

With regard to the historical aspect of the case, light and air have received consideration as important commercial factors from very early times.

In the Roman law they were regarded as "*res communes*." Therefore the right does not consist of a title to possession of light and air, but in some obligation to refrain from using certain land so as to materially interfere with the light and air which will pass over the land to the tenement to which the right is annexed. Thus the old maxim of law "*cujus est solum, ejus est usque ad cælum*" is modified to this extent.

In the English law, previous to the year 1832, the right to the enjoyment of light and air was acquired only by prescription at common law, *i.e.* evidence had to be produced to go back as far as "the memory of man had not run to the contrary," and this was settled as being the commencement of the reign of Richard I. (A.D. 1189).

By the Statute of Limitations passed in 1623, adverse uninterrupted possession for twenty years gave a sufficient title to land, and it was also held by the judges that such possession was evidence from which a jury might presume a grant, provided that it was "*nec vi, nec clam, nec precario*."

In 1823 Statutes of 2 and 3 Will. IV., commonly known as the "Prescription Act," placed the length of time definitely at twenty years. As, however, an interruption of such user must be for at least one year, it follows that nineteen years and one day is sufficient time to acquire the easement. Curiously enough, however, the Courts will not grant an injunction until the full period has elapsed, but in the event of the right being infringed before the twenty years has expired will wait till the period is completed (*Flight v. Thomas*, 11 A. & E. 668; *Bridewell Hospital v. Ward*, 62 L. J. Ch. 270, 1893).

### Acquisition of Easement.

An important point for the gentlemen of our profession to remember is that under the Conveyancing Act, 1881, a grant of light is deemed to be included in the conveyance. And even where adjoining land was marked as "building land" on the deed plan, this was held by Lord Justice Lindley not to show a contrary intention with regard to section 6, subsection 4 (*Broomfield v. Williams*, 66 L. J. Ch. 305).

Easements are also acquired by implied grant. The principle underlying this form of grant is that a man cannot derogate from his own grant. This form of case frequently arises in the development of building estates, where specific covenants as to easements are not inserted in the lease.

Where a man built a house and then sold it, and afterwards sold the land adjoining, it was held that the purchaser of the latter could not obstruct the light of the house (*Palmer v. Fletcher*, 1 Sid 167).

More recently, even where the plaintiff had obtained her lease upon a building agreement, and where the adjoining land was marked out in building plots, and so shown on the plan, it was held that there was nothing to give the grantors liberty to interfere with the access of light to the plaintiff's house (*Pollard v. Gare*, Ch. Div. 834, 1901).

### Commencement of Easement.

It is well to remember that the twenty years commences to run practically from the time that the carcass of the building is completed, and that the enjoyment by occupation is not necessary (*Courtauld v. Legh*, 4 Ex. 126, 1869). The mere fact of pulling down does not operate as a loss of the easement (*Ecclesiastical Commissioners v. Kino*, 14 Ch. Div. 213). Any lights that are built in the new buildings are protected as far as may be by the positions of the previous lighting superficie (*Tapling v. Jones*, 11 H. L. C. 290, 1865; *National Provincial Plate Glass Company v. Prudential Assurance Company*, Ch. Div. 757; and *Scott v. Pape*, 31 Ch. Div. 554).

We have already noted that the easement may be lost by the obstruction for one year. It may also be lost by abandonment.

### Intention of Abandonment.

The question that the Courts always inquire into is the intention. In one case in which a plaintiff had ancient light he blocked them up; but it was obvious from the outside that

\* A paper read before the Birmingham Architectural Association by Mr. H. Phillips Fletcher, F.R.I.B.A., F.S.I., A.M.I.C.E. Barrister-at-law.



there had formerly been windows. Nineteen years later the defendants erected a boarding to obstruct such windows. Held that lights were not permanently abandoned and verdict for the plaintiff (*Stokoe v. Singers*, 26 L. J. Q. B. 257).

In another case it was held where a window had been partially covered by shelving that there was no intention of abandonment (*Smith v. Baxter*, Ch. Div. 138, 1900).

#### *Estimating Injury.*

This portion of our subject is certainly the most difficult that confronts us. Professor Kerr and Mr. Homersham Cox both had excellent theories for the mathematical calculations of loss of light and air, but as the Courts would not accept them it would not be very profitable to discuss them. You will see various diagrams around this room that were prepared in the endeavour to illustrate the effect of alleged infringement to easements of light and air. It may, perhaps, be mentioned that the diagrams before you have in every case, whether for the plaintiff or defendant, been successful in either obtaining a verdict or in arriving at a successful compromise. It is impossible in the limited time to attempt to explain them.

You cannot make stock diagrams for stock cases, and each case has to be very carefully thought out with a view of preparing such drawings as will fairly show the effect of the new buildings upon the easement.

Architects as a rule (myself among the number) get very annoyed at having a building stopped owing to an action for light and air.

But we should remember that, after all, the latter is as much an easement as rights of support, way and water, &c., and that a party may have bought a building because it was exceptionally well lighted.

I had a small clinometer made for use on buildings. By his instrument one can obtain fairly accurately the angle loss of light on the site, and if any gentleman present cares to have one made on similar lines I should be very pleased to lend it to him for use as a model.

In the October number of the "R.I.B.A. Journal" Mr. W. Quick has some interesting diagrams with regard to the sun's direction and position, together with the shadows affecting light and air.

He has, however, apparently neglected the fact that all windows are not necessarily lighted by direct rays from the sun; in fact, in towns a large majority are not so lighted, and, of course, artists and others could not use such rooms.

The study of astronomy is always interesting; but we fail to see that any benefit with regard to light and air can be derived from the diagrams and tables given. This information, if of any real value in the Law Courts, could always be worked out by a competent architect or engineer with the assistance of the nautical almanac. The Courts mainly consider this subject from the standpoint of the diffusion of light.

The final paragraph in Mr. Quick's letter is somewhat amusing, and we are glad that at last someone has discovered how to deal with a subject "in a moment," while Chancery judges very often take days to decide such questions.

Two recent cases in the Court of Appeal have put the law into a much more concise state than heretofore, viz. *Warren v. Brown and Home and Colonial Stores v. Colls*.

In *Warren v. Brown* (1900, 1 C.A. K.B. 15) Mr. Justice Wright's decision was reversed, and it was held that although abundant light was left for all ordinary purposes, yet that the plaintiffs were entitled to relief for the damage done by the defendant's buildings. Lord Justice Romer also said that at the present day, if ancient lights are interfered with substantially and real damage thereby ensues, that relief should be given, and in particular in considering whether a house has been substantially injured it is proper to have regard to the ordinary uses by way of habitation or business to which the house has been put, or might reasonably be supposed to be capable of being put.

Some houses, owing to their having numerous lights, are extremely valuable for purposes of habitation and business. In such cases a building owner cannot justify a substantial interference with such lights on the ground that other houses, or some imaginary standard house, are or is not better lighted than the injured house after the injury.

In the case of the *Home and Colonial Stores v. Colls* (1901, 8 T. L. R. 212) Mr. Justice Joyce, in the Court below, was of opinion that the selling and letting of the plaintiffs' premises were not affected.

The Court of Appeal, however, held that the plaintiffs could have to use more artificial light, and it was impossible to hold that there would be no "real damage," and a mandatory injunction to pull down was granted. Lord Justice Vaughan Williams doubted very much if the angle of 45 degs. can be regarded even as a rough measure of the right of the owner or occupier of ancient lights. This latter is very important, because, as before explained, each case must be decided on its own merits, and the effect of a distant building, even at the same angle as the one less remote, is not so injurious to

the dominant tenement, because the latter enjoys a large lighting area, consequently more diffused light comes to such building.

These two important cases therefore emphasise the following points:—

1. Substantial interference to light and air must be proved before the plaintiff can succeed in his action, not that which some person having fantastic or peculiar views might suggest is substantial diminution, but having regard to the views of some person of ordinary sense and judgment.

2. There is no supposed standard as to that which a house ordinarily requires by way of light for purposes of business or habitation.

3. When premises are well lighted, and certain businesses requiring much light are or can be carried on, these facts are not to be disregarded in considering the effect of the interference.

4. Lord Justice Cozens-Hardy suggested that in judging of the probable effect of the proposed building the Court may not unreasonably regard the fact that the angle of 45 degrees will be left as *prima-facie* evidence that there will be no substantial interference, and may require this presumption to be clearly rebutted by satisfactory evidence. Lord Justice Vaughan Williams strongly dissented from this point of view, and doubted if this could in any case be taken even as a rough guide.

5. The effect on the selling and letting value is not always a guide. Where plaintiffs are occupiers they are entitled to use their own premises for the same purposes as heretofore and with the advantages.

#### *Loss of Air.*

With regard to the loss of air *per se*, such loss is usually rather a difficult claim to substantiate. In recent years, however, the Courts seem to incline to consider damage to air as more serious than heretofore, and in 1897 the House of Lords, in *Chastey and Another v. Ackland* (L.T. 76, N.S. 430), intimated their intention of reversing the decision of the Court of Appeal, who held that there could be no right by prescription to air coming over the roofs of houses. The parties, however, came to a settlement by which the appellants agreed to accept a sum of money in settlement, the respondents agreeing to pay the costs in the Lords and the Courts below. So that we must not lose sight of the effect of loss of air upon a dominant owner's property.

#### *Conclusion.*

I would suggest to you that, though the dominant owner's hands have been materially strengthened by modern law cases, it is still incumbent upon us to remember that if we can make satisfactory terms with the building owner it is generally advisable to do so. Moreover, the wrecking of well-designed buildings by light and air cases is much to be deprecated, and we all ought to do our best and endeavour to make the buildings to be erected as worthy of our great Empire as may be.

To show the extreme bias that exists among some of us, an architect who is in large practice in London mentioned to me not six weeks ago that without any investigation he always declined to act for the dominant owner in light and air cases, but would always act for the servient owner. Surely this is scarcely the frame of mind in which to give evidence which will be any real assistance to the Courts.

Another architect said to me quite recently that he had given up trying to erect decent buildings in the City of London, because they were always cut about by light and air cases. My reply to him was that if he could study the law of the subject, he would know that which he could safely erect; and that if he would consult all the servient owners affected before commencing his building operations, his buildings and his clients would probably both be more satisfactory to him.

With regard to the proposals formulated by Councils of the Royal Institute of British Architects and the Surveyors' Institution, I scarcely think that the methods suggested will be of any real value.

The proposed procedure seems to leave legal points to be settled in the first instance by surveyors, and would also seem to render possible even more appeals than are at present permitted.

The question also occurs to one that if the law be altered with regard to the easements of light and air, why should it not be altered with regard to every other kind of easement which is obtained in precisely the same manner?

A counsel learned in the law was speaking to me the other day of the present crying need for healthier conditions in our houses and buildings, which could be insured by a freer access of light and air. He expressed surprise that some of the leaders of our profession—the highest aims of whom should be directed towards effecting these conditions—should endeavour to get a Bill through Parliament for the destruction of those private rights which are one of the few checks upon the annihilation of these elements.

We are liable at times to forget the legal and reasonable



rights of adjoining owners when we are unable to carry out a building in its entirety.

Perhaps from looking at light and air from this standpoint we are apt to take rather a one-sided view; but if we were to put ourselves into the place of a purchaser who had bought a building solely because of its dominant light, which latter was essential to his special business purpose, we should probably think that the law as it stands does not protect one sufficiently. No doubt there are some people who try to take an unfair advantage of the law as now laid down. But this proportion is small, and they can receive no support from practitioners of any standing.

#### NORTHERN ARCHITECTURAL ASSOCIATION.

THE opening meeting of the winter session of the Northern Architectural Association was held on the 12th inst. at 56 Northumberland Street, Newcastle.

The president (Mr. Frank Caws) occupied the chair, and delivered his inaugural address. He thanked the members of the Association for the honour they had again conferred upon him, and proceeded to say that their own profession of architecture in this north-eastern district had not progressed at a rate at all commensurate with the great march of local industrial improvement. They heard in these days not infrequently allusions to the so-called "new architecture" by the "new architect," but they found those were mere expressions; they looked in vain for the realities. New trivialities, new vulgarities, new monstrosities, new strainings and over-strainings after originality offended their taste and pained their sense of fitness and propriety at every turn in their walks through our streets, but they looked in vain for any substantial proof or promise of real architectural improvement. It was a sad thought, if a true one, that the old-world architects were and must ever remain the record-breakers of the profession. To have that fact borne in continually on the mind by the evidence of the mighty and majestic works of the oldest masters was depressing and deadening in such a degree to the young architect whose brother was, say, a chemist or an electrician, full of keen expectation of surpassing to-morrow the marvels of yesterday, that it was, perhaps, no wonder if he did occasionally "chuck" his profession from a feeling that it was scopeless and hopeless. There were young architects, and old ones too, who had never realised the difference between the limitations of progress which seemed to environ their own profession and the great scope of certain other professions which were apparently invested by a boundless sea of accessible new attainment. These architects might live and work content that the thing that hath been was the thing that shall be. Judging, however, by the frantically ridiculous struggles for "something new" which many modern architects were making, they were by no means at rest within their professional limitations, and seemed crazed with the craving for they knew not what. It could not be denied that with all its restlessness and pettiness and vain theatricality our most modern architecture was a more or less faithful reflex of the character of our age and generation, and certainly if they might forecast the future from the past, one of the outlets for the development of "new" architecture (whether improved on or not was quite another matter) was in the adaptation of new designs to the spirit and taste and fashion of the day. While deference to the fashion of his time is obligatory on the architect who did not desire to become unpopular, yet there was a great distinction between the deference which was servile and that which was conciliatory; and no architect in following fashion should fail to use his own trained taste and judgment in accentuating what he felt was good and in minimising what was bad in the type which he was affecting. Whether they liked it or not, undoubtedly the new architecture, such as it was, was being developed by the fashion of our day, and they must make the best they could of it. Perhaps if they "followed the gleam" and each did his best according to their opportunities to convert a glimmer into a dawn, they might be unconscious contributors of some new architecture which they could not now realise, except "through a glass darkly." They had at their command new materials and methods and appliances, and if they made themselves thoroughly acquainted with their nature and possibilities, and quite proficient in their application, they would necessarily, though slowly and to a large extent unconsciously, be contributing to the formation of that truly new architecture which was destined to gladden the eyes of future generations. The Northern Architectural Association was not able to supply souls to those of them who had not got any, but it helped students and members to become masters of the instruments, so to speak, of their profession. Mr. Caws proceeded to mention the numerous advantages derived from membership of that Association, and commended the classes carried on at the Durham College of Science. Their Associa-

tion was stronger than ever it was, and if they all pulled together, instead of finding fault, there was a bright future before them. If that Association in its first function as a professional tribunal and in its second function as an architects' social centre had achieved some measure of success, still more had it succeeded in fulfilling its third function as an educational agency. Proceeding, Mr. Caws remarked that the study of old works, both in books and buildings, not only informed the student of facts, but created, as it were, both a mental soil and a mental atmosphere, rich enough and rare enough to produce new and beautiful growths which could not have taken root and found sustenance in the stormy and thorny ground of the uncultivated mind. Every beautiful building, whether old or new, was an educator. The sense of fitness and propriety generally accompanied, if it did not help to constitute, the sense of beauty, and the more they were driven by force of circumstances to regard fitness as the chief aim of all their designs, the more pleasing and satisfactory would be their outcome. He thought their profession had suffered from attaching too much importance to exterior elevational design and too little to internal design. From the very nature of the case, and especially from the play of light and shade, the interior of a building was usually much more interesting and much more capable of artistic and poetic treatment than the exterior, and it seemed a pity that architects should leave to the professional decorator so much of the internal treatment as should more properly be regarded as the chief artistic opportunity of the architect himself. Concluding, Mr. Caws said no matter what materials were placed at their disposal, they would never be able to do justice either to them or to themselves unless they made themselves thoroughly conversant with those great physical principles which applied to all materials under the sun, and by the wise application of which every structural material was made subservient to the architect's dream. Those principles were strict, straight, stern and strong, and formed a backbone to any structural scheme to which the architect properly applied them. While they should lean hard on those principles, their imagination must not be neglected, for art, as well as science, claimed devotion. It might be that few succeeded throughout their professional career in preserving that true balance between science and art, between faithfulness to truth and the worship of beauty which was characteristic of the genuine architect. To maintain that balance was a great struggle for even the strongest intellect and will, but it was the struggle to which their profession called them, and if they succeeded in it the greater was the glory that the strife was hard.

The hon. secretary (Mr. A. B. Plummer) read the award of the assessors (Messrs. F. Caws and R. Burns Dick) in connection with the offer of prizes by the ex-president (Mr. W. Glover) for the best sets of testimonies of study drawings prepared for the R.I.B.A. intermediate examination. The prizes were awarded to Mr. C. I. Greenhow, Newcastle, and Mr. W. A. Chamberlain, Tynemouth, whose work was much admired.

A large photographic group of members of the Association and a photograph of the late Mr. Thomas Oliver, the first hon. secretary and a former president of the Association, as well as one of the founders, had been received, and were in readiness for hanging in the rooms.

The meeting closed with the usual votes of thanks.

#### GLASGOW SCHOOL OF ART.

THE annual meeting of the Glasgow School of Art was held last week, Mr. Jas. Fleming presiding.

The annual report stated that the review of the past session was that of the first complete year of work under the official recognition of the Scotch Education Department. The school was now the central institution for higher art education for Glasgow and the West of Scotland. Periodical expert visitation was substituted for the Board of Education examinations, and a block grant supplanted all payments upon results. The governors were authorised by the Scotch Education Department to issue diplomas, and the holders would be entitled to the use of the letters G.S.A. The school was now divided into an upper and a lower school, and a responsible professor under the headmaster was placed at the head of each department. The governors had appointed M. Paul-Artot, who obtained his education in the Académie des Beaux-Arts in Brussels, under M. Portaels and M. Ch. Vanderstappen, as professor in the antique classes; and Mr. George Gregory, who came from the studio of Messrs. Brindley & Farmer, ecclesiastical sculptors, had been appointed master of ornament modelling. A class certificate examination took place in the architectural section, and the results were as follow:—Building construction—Senior, two passes out of five candidates; intermediate, six passes out of fifteen; preparatory, three passes out of fourteen; architectural design, three



passes out of seven; history of architecture, one pass out of two. In conjunction with the Scotch Education Department, the governors offered local bursaries amounting to 125*l*. Seven of these were of the value of 10*l*. each; ten of 5*l*. each, viz. three for life drawing and painting, one for figure composition, three for architecture, four for modelling and six for design. The conditions of the bursaries were that students must continue their studies at the school for another session, and visit the galleries and museums of art centres, such as London, Paris, &c. Ninety bursaries of the value of 120*l*. were offered for competition, as in former years, by the Haldane Trustees. In lieu of the free studentships hitherto granted by the Department to artisan students, twelve free studentships tenable in the day classes and thirty free studentships tenable in the evening classes were now being given by the governors. A new feature of the past year's work was the formation of Saturday classes for the instruction of school masters and mistresses. Sixteen students had received appointments as teachers, designers, &c. The total enrolments of students for the session were 998, being an increase of 160. The governors acknowledge grants from the Haldane Trustees, 200*l*; from the Corporation, 1,000*l*; from the Corporation towards building fund, 500*l*. A debit balance of about 1,000*l*. still stood against the building fund. The rearrangements in organisation and the alterations in management lately effected had all been for the permanent benefit and improvement of the school, and the governors were assured that the teaching staff and the equipment of the classrooms would make the Glasgow School of Art a centre where the most advanced art education could be obtained. The governors had endeavoured to meet the growing demands for advanced instruction in all branches of the fine arts, more particularly those bearing on the industries of the West of Scotland. They were conscious of many things that demanded more attention, but which they could not yet see their way fully to satisfy.

The Chairman said the new regulations under which the school was now conducted had been in force during the last year, but it was far too soon to pass a complete and thorough judgment on them. The governors were thoroughly satisfied so far with the experience they had gained, and all that had happened led them to believe that a great development of work would ultimately result from the new regulations. These laid a heavier burden on the governors, and to a much greater extent on the teaching staff. The teachers must now be alive that they were thrown upon their own resources, and unless they threw themselves heartily into their work the new regulations would not be a success. The staff had realised to a large extent their responsibilities, and if the results in the future continued to be equally good with those obtained last year the governors would be able to say that the change had been a most admirable one for all parties. He then referred to the strengthening of the staff, and remarked that if the governors had the money there were other developments which would still further raise the teaching power of the school and be for the benefit of the students. He alluded to the support received from the Haldane Trustees and the Corporation, and expressed his belief that if the students increased in number and more money was found absolutely necessary, it would be got from some source or other. Under the arrangement made with the Scotch Education Department the school received for five years a fixed sum of 1,000*l*., and it was probable that if the school improved the sum might be increased.

Sir Francis Powell said that the city of Glasgow depended greatly on art. Every article of commerce nowadays had some trace of art; unless it did so it was not marketable. Glasgow, therefore, ought to support art to enable the merchants to avail themselves of the best and most perfect art to produce decorations, and not to copy those trashy things that they saw titled "Printed in Germany." It was a strange thing that if goods were stamped by a town on the Continent—say, in France, Germany or Italy—they were supposed to be good art. It was very rarely so. There was at the present day, so far as he could see, as much good art in this country as anywhere. Glasgow ought to give every support to enable them to see what could be done in art, because it cost no more to print and embellish a thing in good taste than in bad taste. But to do that not only had the student to be educated, but also the people to see and know the difference between good and bad art. He considered the sum of 1,000*l*. given by the Corporation to be a paltry sum for a city like Glasgow. Sir Francis afterwards referred to the work done by the students as exhibited in the walls of the Institute.

Sir John N. Cuthbertson afterwards gave a short address. He remarked that with the school of art and the technical college the educational institutes of Glasgow were almost complete. He afterwards referred to the qualifications which were at one time demanded from the teachers under the School Board to teach drawing, and said he feared these qualifications could hardly now be reckoned sufficient. The Board were not now attempting so much in this direction as they did at one time, and he was sure the Board would endeavour to send all

their best drawing pupils to the school of art to get a better and a higher education. He further expressed his belief that if the governors found they required more money for the development of the school it would be obtained.

On the motion of Mr. McLean a vote of thanks was given to Sir John Cuthbertson for his address.

A vote of thanks was, on the motion of Professor Phillimore, passed to the staff, and the meeting separated.

#### BERMONDSEY ABBEY.

THE historical records and buildings committee of the London County Council report that during the recent excavations made in connection with the erection of working-class dwellings by the South-Eastern Railway Company on land belonging to the Council in Abbey Street, Bermondsey, some interesting discoveries were made of the remains of Bermondsey Abbey. The finds include some pieces of masonry consisting of Kentish rag, which would appear to have been the foundations and lower courses of the chancel of the old abbey church, and certain fragments of wrought stonework which may date from the reign of Henry III. (1216-1272), and some pieces, probably part of the transom or head of a glazed screen with two series of foliations, the dates of which may approximately be fixed between 1483 and 1530. In consequence of these discoveries further excavations were made, with the result that several additional pieces of stone were found, consisting of remains of jamb, arch and sill stones of what appear to have been parts of a large Perpendicular window and doorway, pieces of a hood-mould and arch of Early English character, part of a moulded plinth, and a piece of shaft. One or two of the stones show traces of polychromatic decoration. A plan has been made showing the position on the site of these discoveries and also drawings recording the mouldings on the wrought stones. A few bronze coins, a token dated 1665, and a broken crucible containing glass have also been found. The remains have been moved to the Horniman Museum. A monastery at Bermondsey was founded in 1082 by Alwin Childe, an eminent and wealthy citizen of London. It was at first an alien foundation, being dependent on the Cluniac Priory of "La Charité sur la Loire." The monastery, which rapidly grew in importance, was in 1399 erected into an abbey. At this time it had attained such dignity as to justify the appellation of the "Westminster of South London." In 1537 the abbey surrendered to Henry VIII, and the site was granted to the Master of the Rolls, Sir Robert Southwell. The latter immediately conveyed the estate to Sir Thomas Pope, who demolished the old conventual church and some of the adjacent monastery buildings, and with the materials built a house known as Bermondsey House. The house afterwards came into the hands of Thomas, Earl of Sussex, who on several occasions entertained Queen Elizabeth there. Long after the demolition of the house the gates and ruined walls of the abbey remained, and the north gate, which led into Bermondsey Square, was still standing in 1805. In Grange Walk there are still to be seen the last remains of the east gateway, the hooks on which the gates were hung still remaining *in situ*.

#### ROYAL SCOTTISH SOCIETY OF ARTS.

THE annual general meeting of the Royal Scottish Society of Arts was held in the Society's Hall, Edinburgh, on the 10th inst., when the president, Mr. F. Grant Ogilvie, delivered his opening address. He gave a *résumé* of the papers communicated last session, and pointed out how actively the Society was adapting itself to the changed conditions under which it now existed. The Society had consistently aimed at affording facilities for the consideration of means by which the natural productions of the country might be made more available, and at encouraging inventions, discoveries and improvements in the useful arts. Eighty years ago it was one of very few agencies available for these purposes. Now there were many such, but the widening of the field provided work and a place for all. Most important among the changed conditions was that of the standard of education. At the present time the methods of work in primary and secondary education in Scotland were in process of adjustment, approaching nearer and nearer to a most desirable ideal set forth with much clearness in official publications. The secondary schools, in that section of their work which was more directly related to the interests of their Society, provided a curriculum in which direct experimental familiarity with the principles of mechanics, physics and chemistry was combined with the study of mathematics, drawing and languages. In this way they aimed at turning out boys of sixteen not only with such a general mental training as would enable them in later years to take their place in the life and commerce of the country, but



also with minds and hands accustomed to question directly the machines and methods they use, and with a ready aid to their higher technical studies in a sound practical knowledge of elementary mathematics and drawing. One way and another the great army engaged in arts and industries would soon be drawing the majority of its young recruits from among those whose school training had done much to cultivate their aptitude for mechanical arts, and had afforded them just the foundation of knowledge of the facts and methods of science that they require for their future work. The number of those entering upon careers connected with arts and industries who had sufficient preliminary knowledge to take an intelligent interest in the discoveries and improvements of the age was now very great indeed. Formal classes of all kinds afforded such young men the instruction they needed in regard to principles, existing practice and methods of investigation. It was left for such societies as theirs to afford to their members opportunities of discussing the changes of to-day and the possibilities of to-morrow, to give a ready means of submitting an invention to friendly criticism and suggestion, and to bring together men interested in the same class of work. He did not speak of the Society as a means of obtaining publicity for an invention. In the past that was no doubt one of its most important functions, but in these days of technical journals and illustrated newspapers of all kinds a much wider public, or at least a more directly interested public, was reached through the press directly than by communications to a Society of Arts. But while that was so, yet to most of those who desired to bring forward inventions or improvements it was no slight advantage to be able to place these before a Society interested in such things, and probably numbering among its members not a few whose comments would be of much value. It was matter for congratulation that for the session now opening they had in view already a goodly supply of communications referring to inventions and improvements, as well as illustrated descriptive papers dealing with such subjects of immediate interest as wireless telegraphy, road-making in the Himalayas, the Nile dam and electricity in the coal mine.

#### EXPLORATION OF CAERWENT.

A LECTURE was delivered in Bath by Mr. A. Trice Martin on the excavations at Caerwent (Venta Silurum), Monmouthshire. He said he would be unable to tell them anything about the work carried on last summer, because they had not yet prepared their report, and if they had they would have had to submit it to the Society of Antiquaries, who had done so much to assist and support them. The generally accepted idea that Roman civilisation and institutions were swept clean away by the Saxons was not correct. In the first place, there were Roman cities remaining, in the case of some of which the continuity of their life was evident. Secondly, many of the so-called Anglo-Saxon institutions were really Roman under a thin disguise. Thirdly, modern research, in which connection he mentioned the names of Mr. Grant Allen and Dr. Beddoe, had shown that the Celtic population of Britain, instead of being driven out, remained among the Saxons, even in the eastern counties; and fourthly, the extraordinarily gradual invasion of the Saxons themselves, who took over one hundred years to reach the neighbourhood of Bath. He told them this to show a reason for conducting the explorations, for they were not curiosity finders, although of course they found relics; but there was another object, which was to obtain a fuller knowledge of the history of Rome itself, and for this purpose they should study not merely Rome itself, but her rule in her provinces as well. Villas or country houses had been dug out until he thought they had come to an end of them, for they were now of similar types; but of the cities they knew little. Silchester, in Hampshire, was the first to be excavated, and it had this advantage, that since the days of the Romans it had been abandoned but for a few huts, and the very outlines of the place could be traced by the way in which the crops grew. The next and only city was Caerwent, where there had clearly been a continuity of life, and where there was at present a village which considerably impeded the work, for, owing to the expenses that would be entailed by keeping open the ground after the investigations were completed, the places had in most cases to be buried again. The walls of Silchester were by no means symmetrical, while those of Caerwent were almost rectangular, the corners being rounded off, and, in his opinion, this pointed to the military origin of the town. The houses in Silchester were chiefly of two kinds: the courtyard type, with the rooms on three sides of the courtyard, and the corridor type, while in Caerwent they had found a unique type, a thing that helped the fund very much, for there the houses were built round all four sides of the open courtyard. Mr. Martin illustrated his

lecture with a number of slides. In some of the houses unearthed the explorers were confronted with difficulties from the extraneous masonry among the ruins, but these were solved after a time when it was found that at a later period in its history another house was built on the site, and in one case a factory had been added later again to the second building. This was particularly noticeable when the baths were found, for in the middle of a very handsome suite was found the factory furnace. Of the rooms in the houses, all of which were noted, the ones Mr. Martin directed special attention to were the winter rooms. In these, with the exception of a few rooms where they actually discovered open hearths where they burnt good old English coal from the Forest of Dean, the method of heating was by placing a tessellated floor supported by pylæ or little pillars on another floor, thus leaving a space into which were placed fires. The excavations round the north gate were specially interesting, for here they found the gateway had been partially blocked up by succeeding generations, while beneath were found the iron heads of pipes of varying diameter which showed that the Romans had an elaborate system of bringing water into the city. They had one disappointment, however, and that was that there were no inscriptions, except a useless portion of one found, but as they had explored only 3 acres out of 43 in the old city they could not expect more. After describing the other discoveries, including the mosaicwork and their schemes of decoration, Mr. Martin showed some pillars whose beauty had surprised them. He observed that in Bath they had greater and finer Roman remains; but they must remember Bath was a much richer place than Caerwent.

#### THE NATIONAL TRUST.

THE annual general meeting of the National Trust for Places of Historic Interest or Natural Beauty, which seeks to promote the permanent preservation, for the benefit of the nation, of lands and tenements of beauty or historic interest, and as regards lands, to preserve their natural aspect, features and animal and plant life, was held on Monday at the offices, 25 Victoria Street. Mr. J. C. Bailey, who presided, moved the adoption of the report, which stated that the movement for the purchase of the Brandlehow estate, on Derwent-water, was on a much larger scale than anything previously attempted by the Trust, and the Council felt that the success with which it met was to be interpreted as a verdict of approval of the work which the National Trust had undertaken and of the mode in which such work was carried out. Princess Louise, Duchess of Argyll, who performed the opening ceremony on October 16 last, was now president of the Trust. An acquisition made during the past year was that of the monument erected on the Dorset coast to the memory of Sir Thomas Hardy, Nelson's flag-captain. The tower had been handed over to the Trust on a 500 years lease, while Colonel Williams, M.P., had presented a maintenance fund to the Trust. The Council regretted the action of the owner of Stonehenge in surrounding the stones with a barbed-wire fence, because it believed that in doing so he had not only obstructed public rights of way, but had done grave injury to the monument in its relation to the surrounding country. The Council was strongly of opinion that the national interest in Stonehenge should be jealously guarded, and it considered that the most satisfactory solution of the problem would be for the monument to pass into the hands of a public body. Reference was also made to the action of the Council in connection with the view from Richmond Hill. The report was adopted, and the members of the Council were afterwards re-elected, with the addition of the names of Mr. Y. Anderson, Dr. G. Dawtrey Drewitt and Mr. O. Fleming.

#### TESSERÆ.

##### Colour Schemes.

THE error of considering the arrangement of colours only as a matter of taste is very prevalent. Mere matters of taste, however, are subjects upon which both nations and individuals differ widely, and there are no productions of this kind, however extravagant or absurd, that have not their admirers while they bear the gloss of novelty or stamp of fashion. Such matters are subject to no rule whatsoever; they are governed entirely by caprice, but it is very different with the arranging of colours, for that is regulated by laws founded on natural principles. There are, no doubt, many varieties of tastes in regard to colours, both individually and arranged. Many have fancies for and antipathies to particular hues. All have their tastes in regard to particular styles of colouring, some being fond of gay and lively, some the rich and powerful, and others the deep and grave. Some have a partiality for complex arrangements, while others prefer



extreme simplicity. But this is the case in music also: every variety and style of composition has its particular admirers; yet it never is assumed from this that the arranging of the notes in a melody or other musical composition is a mere matter of taste. All know that the arrangements of notes in such cases is regulated by fixed laws which cannot be deviated from without giving offence to the ear, and that a knowledge of these laws is absolutely requisite to everyone who wishes to cultivate that pleasing art. It does not matter under what circumstances a variety of colours is presented to the eye. If they be harmoniously arranged the effect will be agreeable to that organ as harmonious music to the ear; but, if not so arranged, the effect on the eye must be unpleasant, and the more cultivated the mind of the individual the more annoying will such discordance be.

#### Mexican and Egyptian Paintings.

Among the different representations on the walls of the Egyptian tombs and temples of the various nations on whom the Egyptians made war, there is represented a people distinguished by very striking characteristics. They are portrayed on the walls of Luxor as driven to their ships by Sesostri or Rameses the Great. Their deportment, their armour and their costume show that they were in a state of civilisation, at least equal to that of the Egyptians. They are eminently a maritime nation; they have been supposed to be Phœnicians, and it is difficult to suppose any contemporary maritime nation besides them capable of maintaining a war with the Great Sesostri, and who is, moreover, recorded to have made an irruption into their territories. Now how are these men, now almost identified with the Phœnicians by the logical necessity of the argument (for, in fact, there is no historical choice of any other nation)—how are they represented? They are beardless and red-skinned. Part of their costume identifies them with the American Indians, almost as much as their physical characteristics. They wear head-dresses like those worn by the Mexican nobles in the time of Cortes and the Peruvian magnates in the time of Pizarro. They consist of a diadem, surmounted by a circle of feathers or palm branches, slightly verging outwards. Anouki (the primitive Syrian Cybele) alone wears this head-dress among all the Egyptian gods and goddesses. In fact, on the walls of the flower-temple of Oaxaca and on those of Xochicalco appear individuals of a nation identifiable with the alleged Phœnicians of the Egyptian temples. They are red and beardless, they wear a similar tunic and the same head-dress, and they exhibit, moreover, the same elevated and classical physiognomy. Statues have been found approaching in facial outline and model the *beau idéal* of Greek statuary. They agree in physiognomy with the people sculptured at Oaxaca and Xochicalco; nor have they anything in common with the exaggerated features of the race of men depicted at Palenque. It may have been that the Mexicans were right in their tradition that their Tultecan predecessors came with the great ancestor of the American people, Votan, from the Ophite or Hivite land in Phœnicia. In fact, a Phœnician inscription has been found engraved on a rock in Massachusetts. Many curious traditions respecting this ancient emigration were preserved among the Mexican Indians, and are collected in different portions of various works which treat of the subject. The lights derivable from them are vague and scattered, but they may tend to impart additional probability to that which cannot be demonstrably proved. Such was the tradition that Votan and his companions, before the emigration, were present at the building of the great tower; that in the course of their emigration they visited or were expelled from Egypt—a tradition true only as applied to the great cyclopean or shepherd family of which they formed a branch. They may, however, have passed it. There is no other land but Egypt to which such traditional designations as the land of the dragon with seven heads, the land of the veils of papyrus, the land of the red lake or sea, could legitimately apply.

#### Effect of Picturesque Scenery.

It may be said that a passion for inanimate scenery, for heath and hill and long stretching down with the sea at its feet, may well engender some coolness and indifference towards a man's fellows, and that in acquiring a love for the stillness, the subtle responsiveness and the beauty of nature, one grows somewhat fastidious in the face of the turmoil and distraction, the uproar and seeming vulgarity, of ordinary human life. Contrasted with the steadfastness of nature here, the existence of the crowd wears a look of meanness, as of straws and dust blown hither and thither by horrid winds. After all, however, what is this but to say that, because you love Turner and Gainsborough, you shall detest your Hogarth? It is true that in Wordsworth one may detect some tendency of this kind. The absorption in which external nature held him engendered an air of coldness, if not quite of apathy, about the accidents of humanity. He certainly never cared as much about men as he did about mountains; never was as deeply stirred by thoughts of the one as of the other; did not find in

the former the stimulus to sympathy and expansion which he found in the latter. Wordsworth's nature, however, was exceptional in this respect, as it was in amount of genius. In the majority of men with any pretence to a fine moral temper there is an instinctive effusion of feeling for their own kind. The study and companionship of external beauty ought to strengthen rather than weaken this. The pitilessness of nature, displayed just as much in her beauty and calm as in her storm and fury, is the fact which, above all others, inspires pity and sense of fellowship, by convincing us that men are in the presence of forces which are absolutely indifferent to their sufferings and their endeavours. Perhaps no one furnishes so striking an example of this order of sentiment as Victor Hugo. Nobody is so sensible as he is of the ruthlessness of nature even while she smiles, and nobody is so alive as he is to the miseries of man and to the fact that our only resource is humane union and constant mutual helpfulness. He perhaps has dwelt more strongly than is altogether wholesome upon the impassive serenity of nature. This is not her only side. If she sometimes derides you by looking her loveliest when you are plunged in bitterness, let it be said also that by-and-by her steadfastness and permanence of relation begin to restore a serenity which is of the highest kind because it is the least narrowly egotistic. There are no doubt two sorts of men—one whom external nature in beauty or in horror most keenly touches, and the other whose sympathies are most directly reached and most generously stirred by the drama of busy human life. There are men who love their kind in the abstract but flee from them in the concrete. There are others to whom nature is cold and unsuggestive and inhospitable. You have Wordsworth, and you have Dr. Johnson or Charles Lamb, who loves the tide of life that flows at Charing Cross. Perhaps it goes without saying that the best and happiest man is he who unites in himself a particle of either temperament—who is content or glad to be alone with the external world, and is not too fastidious nor too loftily cloudy to enjoy the life and spectacle of the crowd.

#### The Barrage of the Nile.

Frequent reference is made in discussing Egyptian affairs to the barrage of the Nile. It is claimed that Napoleon I., when in Egypt, suggested the construction of such a work, but the honour of attempting to realise it is due to Mehemet Ali, who instructed one of his engineers, M. Mougel, to commence operations in the year 1846. The barrage crosses the Nile about twelve miles below Cairo, where the river divides into two branches, terminating in the Rosetta and Damietta mouths respectively. From end to end, the total length of the structure is  $1\frac{1}{4}$  mile. At the time of commencing the works the depth of water at high Nile ranged from 5 feet to 80 feet; so the first operation was to excavate the shallow portions and to fill in the deep bed with a huge mound of rubble. Upon the site thus prepared a broad and thick mass of concrete was deposited as a foundation for the barrage proper. In Oriental fashion, Mehemet Ali having once made up his mind to carry out the work, wished to see it realised at once. He insisted upon the mass of concrete above referred to being completed during the low Nile of 1847, which involved the mixing and depositing of no less than 4,000 tons of concrete per day. On the barrage itself and the three canals in connection with it an army of 80,000 men withdrawn from the villages was employed. The unfortunate fellahs were crowded so thickly on the work that control or supervision was impossible. As an inevitable result the mass of concrete upon which the efficiency of the barrage depends is in places merely a dislocated mass of sand and stone, without any cementing medium. Upon this rotten foundation an ornamental and massive structure of brick and stone was erected, and still remains a standing monument of the folly of its projector, who ruined an admirably conceived scheme by the childish impetuosity with which he attempted to realise it. To form an idea of what the superstructure of the barrage is like, it is only necessary to imagine two long railway viaducts, with a fort between them. The barrage across the Rosetta branch is 1,525 feet in length between the abutments, and includes sixty-one arches of 16-feet 4-inches span and two locks. That across the Rosetta branch is of similar construction and 1,787 feet long. The mass of concrete forming the foundation is 112 feet wide and 12 feet thick; the width of the roadway over the arches of the barrage is 30 feet, and the height of the same above low Nile level is 39 feet. Large iron sluices are fitted in the arched openings of the barrage, by closing which it was hoped to dam back the river and raise its level 15 feet on the up-stream side. Owing to the defects already referred to, it has been found impossible to effect this; and indeed, when it was attempted a part of the structure cracked seriously and began to move down-stream. Between the two barrages the Menoufieh Canal, having a bottom width of 200 feet, or about three times that of the Suez Canal, leads off to irrigate the lands between the two branches, and similar canals have their headworks on the flanks of the barrage.



### Individuality in Art.

Not only do no two artists see nature the same, however highly trained their eye may be, but the unconscious preferences of a nature's whole condition dictates in each individual case the treatment, accentuating one side or the other of nature's complete truth. There is no such thing as positively provable *rightness* after the teachable qualities in art are once satisfied. The whole nature, not only the eye, is the tablet on which the facts of "sight" are reflected; and if spiritual and intellectual powers are prominent elements in the artist's nature, as well as emotional sympathy towards form and colour, the artist's gift reflects such elements as part of nature's truth, affecting its aspect as necessarily as does the sunlight or the moonlight. The motive power of the art emanating from such natures springs from a richer well, including human powers of a higher order than those of mere sense and emotion. The core of the truth of nature is revealed to the poet-painter, not merely the truth of her aspect. This is unquestionably obvious, but does not answer the whole question. Not only is there in really great painted poetry a power in the purely artistic gifts rightly to translate in the language of art emotional, spiritual and intellectual truths, but there is genius in the touch which makes such art not only a right rendering of such elements in nature, but a happy rendering. There is to be found in it an inspiration in the handicraft as well as in the mind. The greatest delight of the artist's craft is to see the poetic preference of his own nature carried out by a happy touch which adds something to nature and makes her his very own. Such a gift is almost unconsciously possessed, proceeding rather from the general condition of the artist's nature and the habitual tone of his sensibilities and character than from any conscious effort. The value of this individuality which stamps all work, noticeable for any power whatsoever from the earliest student studies, is to be gauged by the character of the unconscious no less than the conscious preference of the artist. The greater his powers as a poet, the subtler, the more elevated, the more extended will be his sympathies with nature; and if he be a born artist as well as a poet, that sense of the inner as well as the outer aspect of nature's truth will inspire his touch as a painter or a sculptor, and complete his work with the beauty which belongs to art as art, and not to art as a copy of nature only.

### Russian Architecture.

When from Novgorod the seat of the empire was, by Ivan, transferred to Moscow, that city received at the hands of its prince a new cathedral, which has since again been demolished: he also constructed a citadel, called Kremlin, and a lesser church, in remembrance of the Transfiguration, which still subsists. Of these, as of all the other churches erected in Russia while the Grecian empire lasted, the architects were Greeks. When the fall of Constantinople caused Italians or natives to be employed, the original style of the country continued so far to influence their designs as still to make these present the Greek exterior in the façade, adorned with enamelled tiles; and the Greek distribution in the cross, with four equal ends, crowned by a large central and four smaller surrounding cupolas, of bulbous form, from between which shot orth steeples, shaped like the minarets of Cairo, of Ispahan and of Delhi: and as the cathedral of every Russian city resembles the Mohammedan mosque, so the Gostinoy Dvor—the square market-place—of every city, with its double range of arcades, resembles every eastern caravanserai or khan, and marks, like the former, the relationship borne by the Russian architecture to the Arab, the Persian and the Moorish, and its common filiation with these from that of Constantinople, whose ramifications, extending alike to the north of Europe and the south of Asia, the Indian and the Atlantic Ocean, enable one, in the market-place of Novgorod, to fancy oneself in the Meidoun of Ispahan; in the cathedral of Kieff, to acknowledge relationship with the mosque of Cairo; and in the Kremlin of Moscow to recognise the minarets of Agra and of Delhi.

### Art and Nature.

Art is essentially the imitress of nature; it is the right reason of the thing done, and every art, and that of building amongst others, is defined by Aristotle to be the habit of producing with judgment, and agreeably to the rules of reason, what is good for man. The efficient cause being in the maker, not in the material, it should be directed not merely to attain its purpose, but to attain a good purpose; it is the judgment by which one object is selected out of many similar objects; it must strive to combine the beautiful with the useful, and as there are many forms of government—but there is one which is the best fitted to the genius of man, which is the best—so also in architecture there are many styles, but one only which is universally acknowledged to be the best. Such were the opinions of the wisest philosophers amongst the Greeks, of those who lived and taught amidst the temples and stoas of Athens, and who knew that they guided the feelings of an

enlightened people. As virtue is the perfection of reason, so is art the perfection of nature; it is nature elevated and improved, and as wisdom is not the creatress of man, but has received him in a state of embryo from nature to improve him by faithfully following up the principles which she has engrafted, so does the artist in the progress of his work keep his eye constantly fixed on that archetype and brings it to perfection under her guidance.

### GENERAL.

**Mr. Edward F. Brewtnall**, one of the members of the Society of Painters in Water-Colours, died on the 13th inst in his fifty-sixth year. He was mainly known as a figure draughtsman, many of his drawings having imaginative subjects.

**Sir John Aird, M.P.**, accompanied by Sir Laurence Alma-Tadema and Mr. E. Boulnois, M.P., left Charing Cross on Tuesday for Egypt, to attend the opening of the Assouan Dam.

**Mr. Allen Stoneham**, of Surbiton, has presented a marble statue of Queen Victoria for erection at Perth, Western Australia.

**Mr. Jesse Clare**, of Sleaford, has been elected as county architect by the Kesteven County Council. The other selected competitors were Mr. Cuthbert Harding, of Lincoln, and Mr. J. A. Mettham, of Grantham.

**The Stonehenge Committee**, in order to meet the dangers of the winter, have recommended the immediate application of wooden props to the stones about which the chief anxiety is felt.

**Mr. H. M'Clure Anderson**, architect, Edinburgh, has obtained an appointment as architect for the Foreign Mission Board of the United Free Church of Scotland in Manchuria, China. Mr. Anderson received his early training in the office of Mr. Hamilton-Paterson, architect, George Street, Edinburgh, and has been for the last four years chief architectural draughtsman for Messrs. Hamilton-Paterson & Rhind, architects, Edinburgh.

**The Metropolitan Asylums Board** have approved a scheme prepared by Messrs. T. W. Aldwinckle & Son for the remodelling of the administrative block, the erection of new staff quarters, receiving-rooms and isolation wards and four storey pavilions at the South-Eastern Hospital, at an estimated cost of 76,000*l.*, and have directed that the plans be forwarded to the Local Government Board for their formal sanction under seal.

**Mr. W. S. Walker**, architect, Bridlington, has been returned as town councillor for Quay Ward, Bridlington, unopposed.

**The Pulpit** for the new Roman Catholic Cathedral at Westminster has been completed by Signor Aristide Leonori, Rome. It is the gift of Mr. Ernest Kennedy, and is constructed of a variety of costly marbles.

**A Public Conference** is to be held in the London Guildhall on Friday, the 28th inst, at 3 P.M., on the operation of the Land Transfer Act in the City since it came into operation on July 1 last, and the desirability of an independent inquiry being held into the working of the Act generally.

**Lord Cranborne** has informed Sir Alfred Hickman that an order was given for 27 viaducts for the Uganda Railway in December 1900 to an American firm which had offered to construct and deliver them in forty-six weeks. The contract provided that actual erection was to be completed within seven months from the date on which the chief engineer should report that he was ready for the contractors to begin work. This he did on December 20, 1901, and the viaducts should therefore have been completed by July 19, 1902. Thirteen of these viaducts have already been taken over from the contractors. Penalties to prevent delay were provided in the contract in the usual manner, but no decision can be come to in regard to enforcing them until the works are finished, and the circumstances under which the delay occurred fully considered.

**The Private View** of the Exhibition of the Royal Society of Painters in Water-Colours will be held on the 29th inst. The exhibition will be open to the public on the following Monday.

**The Collection** of antiquities in the Guildhall Museum has been increased by the addition of some ancient relics unearthed in the course of recent excavations in Tabernacle Row. They comprise a number of articles for domestic use, and are all in an excellent state of preservation, including some portions of cloth garments considerably over 300 years old. These antiquities are attracting considerable attention from those in the habit of visiting the museum. Several volumes of records of city parishes have been also obtained.









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**BURTON COURT, SLOANE SQUARE.**

PAUL HOFFMAN, Architect.



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The Architect, Nov 21<sup>st</sup> 1902.







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PAUL HOFFMAN, Architect.



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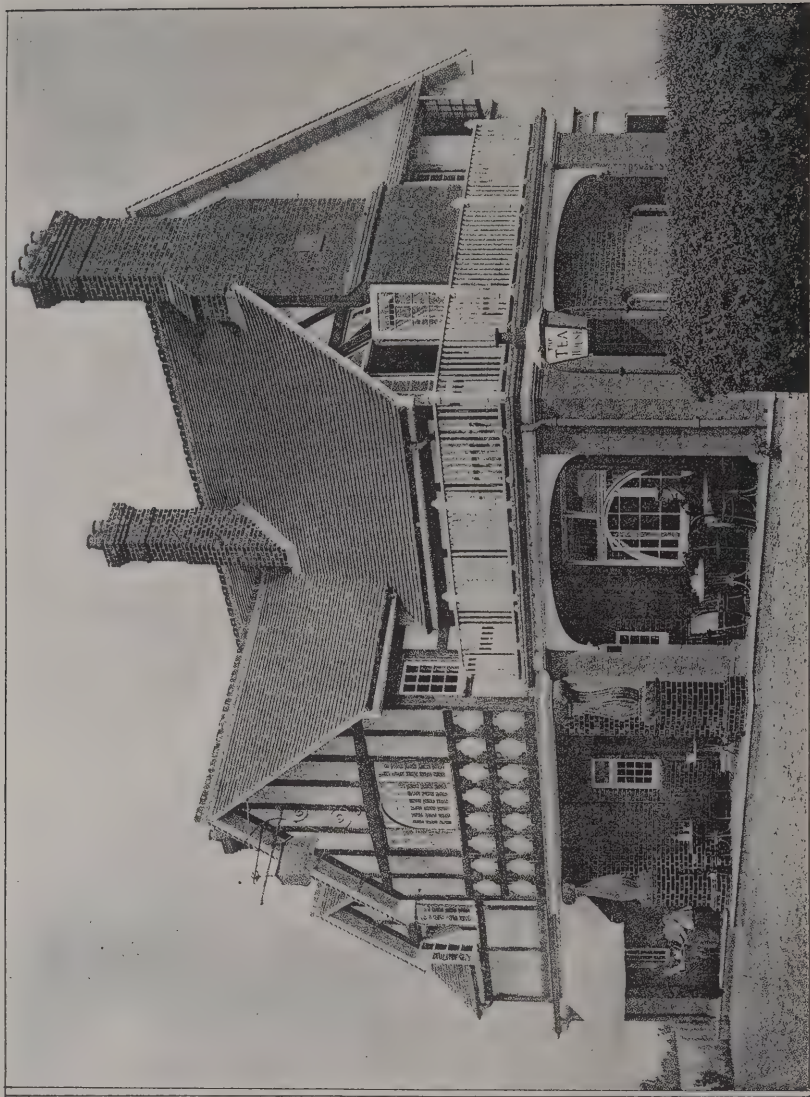


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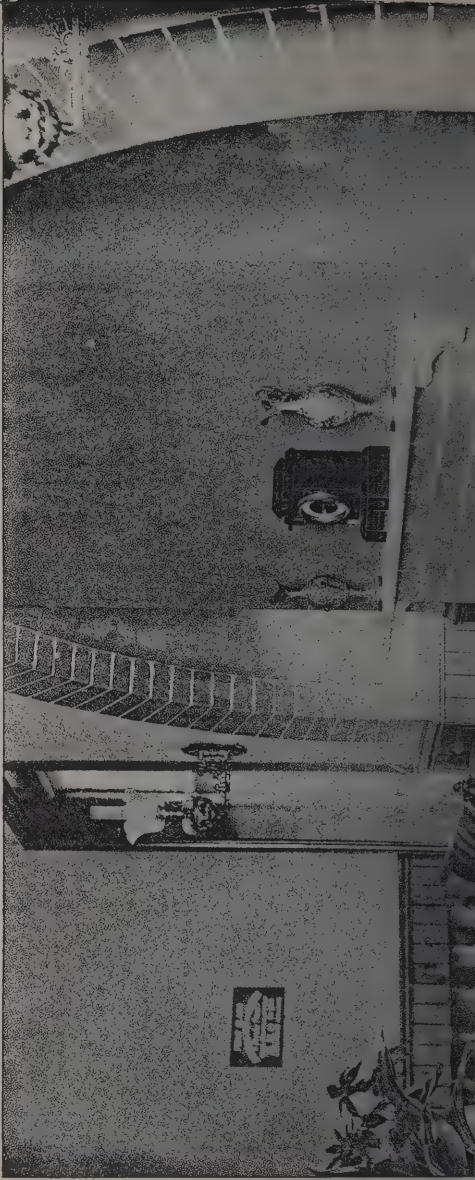




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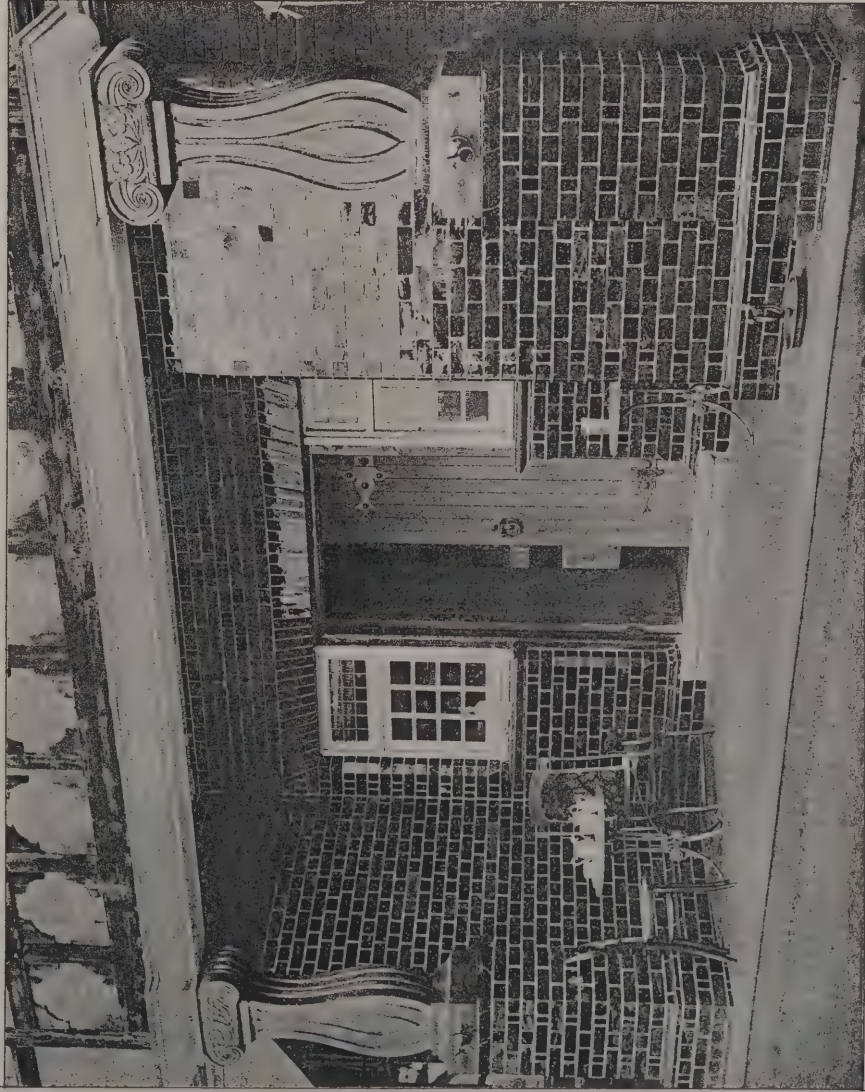




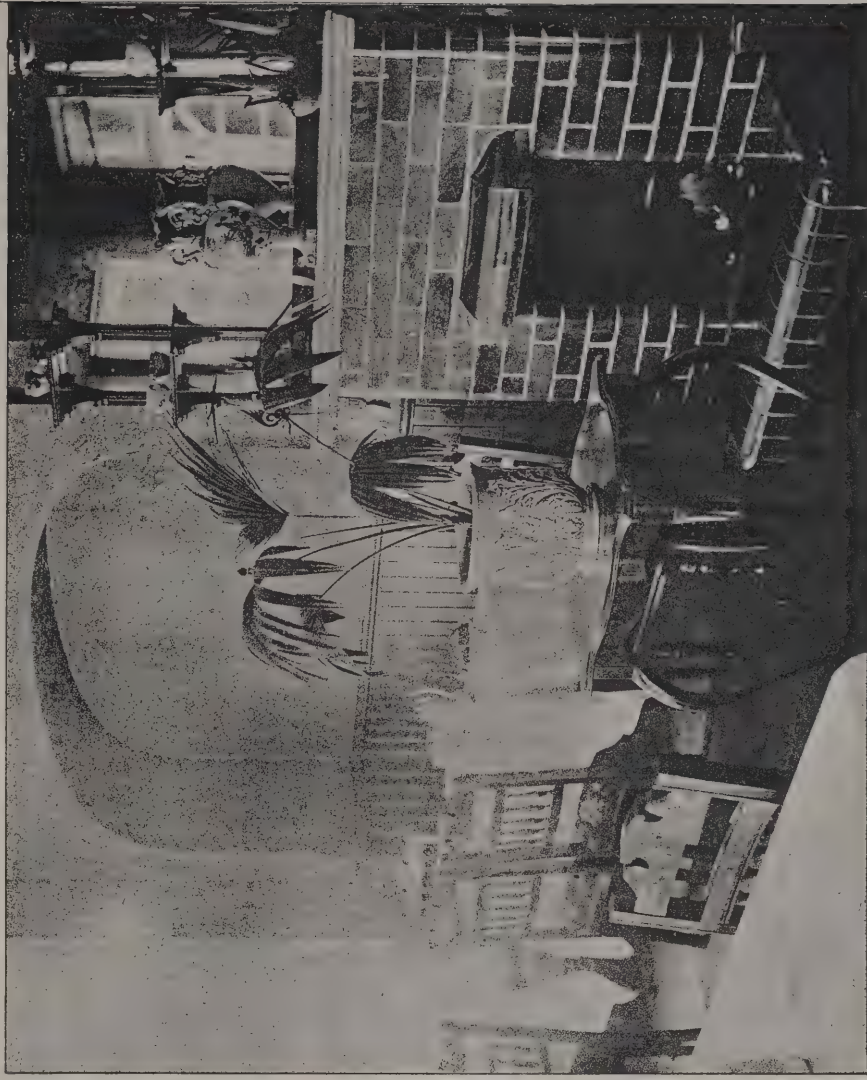
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THE SMOKING ROOM.



DETAIL OF ENTRANCE.



A CORNER OF THE COFFEE ROOM.

THE TEA HOUSE: REIGATE HILL, SURREY.  
G. E. SALMON, Architect.

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THE

## Architect and Contract Reporter.

## EDITORIAL NOTICES.

*In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

## TENDERS, ETC.

*As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

## COMPETITIONS OPEN.

**ASHTON-IN-MAKERFIELD.**—Dec. 31.—Designs, &c., are invited for the enlargement of the Infectious Diseases Hospital. The architect whose plans are accepted and approved will be retained by the Council to carry out the work at the usual professional charges. Plan of the hospital site, together with full particulars of the alterations and extensions required, may be obtained from Mr. T. Burgess, surveyor, at the Council Offices.

**BRIDGWATER.**—Feb. 28.—Plans, specifications and estimates are invited in competition for power and appliances to deal with the accumulations of silt in portions of the river Parrett. Mr. W. T. Baker, town clerk, King Square, Bridgwater.

**BURTON WOOD.**—Plans and estimates are invited for proposed new church and church hall. Mr. W. Southern, Rose Villa, Collins Green, Newtown-le-Willows.

**CAPE TOWN.**—Jan. 31.—The Council of the University of the Cape of Good Hope invite designs for the erection of university buildings. Premiums of 400*l.*, 200*l.* and 100*l.* will

be awarded to the authors of the designs placed first, second and third respectively. Particulars of the competition may be obtained on application to the Registrar at Cape Town, or to the Agent-General in London.

**DURBAN (NATAL).**—Dec. 18.—Designs are invited for new town hall, library, museum, art gallery and municipal offices. Three premiums of 500*l.*, 300*l.* and 200*l.* respectively will be awarded for the three best designs in order of merit. Mr. W. H. Radford, C.E., Albion Chambers, Nottingham.

**ECCLES.**—Dec. 12.—Plans are invited for the laying-out of an area of land and for erection of dwellings for the working-class on part of such area. Premiums of 50*l.*, 30*l.* and 15*l.* will be awarded in respect of the plans placed first, second and third in order of merit. Mr. Wm. Henry Hickson, town clerk, Town Hall, Eccles.

**HOLYHEAD.**—Dec. 2.—Sketch designs are invited for schools and a teacher's house. The competitor whose designs and terms are approved and accepted by the Board will be appointed the architect. Mr. R. E. Pritchard, clerk, Holyhead.

**HULL.**—Jan. 31.—Designs in competition are invited for the extension of the town hall. Premiums of 300*l.*, 200*l.* and 100*l.* are offered. Mr. E. Laverack, town clerk, Town Hall, Hull.

**ILKESTON.**—Nov. 28.—Competitive plans for a mixed junior school to be erected in Bennerley Street are invited. Particulars may be obtained from Mr. Wright Lissett, Town Hall, Ilkeston.

**KINGSTON-ON-THAMES.**—Jan. 15.—Plans and designs are invited for a central home and cottage homes for children of both sexes in the Kingston Road, in the parish of New Malden. A premium for the first three selected plans of 25*l.*, 15*l.* and 10*l.* respectively is offered. Mr. Jas. Edgell, clerk, Union Offices, Coombe Lane, Kingston-on-Thames.

**SCOTLAND.**—Nov. 29.—The Arbroath Golf Club invite competitive plans for a new golf club-house at Elliot. Mr. William Alexander, secretary, 62 High Street, Arbroath.

**WORKINGTON.**—Competitive designs are invited for a new public library to be erected in Finkle Street. Premiums of 25*l.*, 15*l.* and 10*l.* are offered. Mr. W. L. Eaglesfield, borough surveyor, Town Hall, Workington.

## CONTRACTS OPEN.

**AMSTERDAM.**—Dec. 3.—For supply of—Contract No. 319—Corrugated and flat galvanised iron (soft steel) with appurtenances. Contract No. 70.—Asphalted cast-iron pipes with appurtenances. Contract No. 71.—Corrugated galvanised iron with appurtenances. Contract No. C8.—Galvanised iron (soft steel). Contract No. D8.—Corrugated and flat galvanised iron plating and roofing. Contract No. E8.—Zincd iron wire. Contract No. F8.—Soft steel. Contract No. H8.—Sundry plates, discs, &c. Contract No. 18.—Light rails and chairs with bolts and sleepers. Particulars may be obtained from the firm of Mart. Nyhoff at The Hague.

**AUSTRALIA.**—Dec. 22.—For erection at Perth, Australia, of a rubbish destructor capable of dealing with forty tons of garbage in eight hours. Mr. W. E. Bold, town clerk, Town Hall, Perth.

**BEAUMARIS.**—Nov. 26.—For repairs to the hospital ship. Mr. W. Hughes, clerk, 34 Castle Street, Beaumaris.

**BEXLEY HEATH.**—Dec. 8.—For erection of car-shed buildings. Mr. T. G. Baynes, clerk, Urban District Council, Public Hall, Bexley Heath, Kent.

**BISHOP AUCKLAND.**—Nov. 25.—For erection of Primitive Methodist minister's house at Coundon, near Bishop Auckland. Mr. J. Walton Taylor, architect, Newcastle-upon-Tyne.

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**BLACKBURN.**—Nov. 24.—For concrete and steel joist flooring and floor tiling. Particulars obtainable from the Town Clerk.

**BLACKBURN.**—Nov. 24.—For supply of two boilers mechanical stokers and fittings, six superheaters, one battery economiser, two feed pumps, pipes, tanks and accessories, three ejector condensers, steam and exhaust pipes, condense-pipes, tanks, valves and accessories, ash and coal conveying and elevating plant. Messrs. Lacey, Clirehugh & Sillar, engineers, 2 Queen Anne's Gate, Westminster.

**BRADFORD.**—Nov. 26.—For rebuilding a warehouse and offices in Thornton Road, Bradford. Messrs. France, Milnes & France, architects, 99 Swan Arcade, Bradford.

**BRIDLINGTON.**—Nov. 25.—For alterations to house, 99 Promenade. Mr. J. Earnshaw, architect, Carlton House, Bridlington.

**BRIERLEY HILL.**—Nov. 24.—For erection of technical school and free library, Brierley Hill, Staffs. Mr. J. Lewis Harpur, surveyor, Town Hall, Brierley Hill.

**BRISTOL.**—Nov. 24.—For erection of a school at Bishop Road, Horfield, Bristol. Mr. W. V. Gough, architect, 24 Bridge Street, Bristol.

**BRISTOL.**—Nov. 27.—For erection of offices, &c., in Telephone Avenue, Bristol. Mr. Henry Williams, architect, Alliance Chambers, Corn Street, Bristol.

**BURTON-UPON-TRENT.**—Nov. 28.—For erection and equipment of an inclined retort plant and machinery at the gasworks. Mr. F. L. Ramsden, manager, Gas and Electric-light Works, Wetmore Road, Burton-upon-Trent.

**CLAYTON.**—Nov. 29.—For erection of a house and two shops at Nursery, Clayton, Yorks. Mr. Sam Spencer, architect, 344 Great Horton Road, Bradford.

**CONISBOROUGH.**—Nov. 22.—For erection of eleven dwelling-houses, with out-offices and boundary walls, and street works on site near Castle Inn, Conisborough, Yorks. Mr. Fred. E. Simpson, 32 Lockwood Road, Wheatley, Doncaster.

**COVENTRY.**—For supply, &c., of a coal conveying plant at the electricity works. Mr. Joseph A. Jeckell, manager.

**DIDCOT.**—Dec. 1.—For alterations and additions to the Board school at Didcot. Messrs. Hoare & Wheeler, architects, 17 Friar Street, Reading.

**EDGWARE.**—Nov. 26.—For erection of latrines for boys and girls at the Hendon Union schools, near Edgware. Mr. J. Hudson, architect, 40 Upper Baker Street, N.W.

**EVERSLEY.**—Dec. 1.—For removal of brick parapets and arches and preparing substructure for steel platform to Eversley Bridge, Hants. Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

**FELIXSTOWE.**—Dec. 1.—For erection of a fire station. Mr. F. B. Jennings, Town Hall, Felixstowe.

**FINCHLEY.**—Nov. 24.—For supply and erection of three water-tube boilers, two steam balancing sets, spare armature and travelling crane, two storage batteries and accessories, feeders, distributing mains, service cable, street lighting, leads, &c. Mr. E. Calvert, electrical engineer, Broadway, Finchley.

**FINCHLEY.**—Dec. 1.—For fitting-up a chemical and physical laboratory, science lecture-room, preparation-room, &c., at Christ's College. Mr. E. H. Lister, clerk, Council Offices, Finchley Hall, Finchley, N.

**GATESHEAD.**—Nov. 27.—For erection of (1) extension of administrative block; (2) discharge block; (3) stabling and ambulance shed; (4) waiting-room, at the Sheriff Hill hospital. Mr. J. Bower, C.E., borough engineer, Town Hall.

**GERMANY.**—Nov. 28.—For concession of laying-down and working for fifty years a water supply for the town of Crajora. Mr. W. H. Lindley, Frankfurt-on-Maine, Germany.

**GLOUCESTER.**—Nov. 29.—For erection of proposed new church at Churchdown, near Gloucester. Mr. Walter B. Wood, architect, 12 Queen Street, Gloucester.

**GRIMSBY.**—Nov. 28.—For erection of foreman's office, weight office and other buildings at the new destructor, Grimsby. Mr. H. Gilbert Whyatt, borough surveyor, Town Hall Square, Grimsby.

**HANWELL.**—Nov. 24.—For alterations to the Boston Road schools, Hanwell. Mr. William Pywell, architect, Cumberland House, Hanwell, W.

**HARROGATE.**—For additions to business premises in James Street. Messrs. Bland & Bown, architects, North Park Road, Harrogate.

**HASTINGS.**—Nov. 24.—For enlargement of Hollington girls and infants' schools. Mr. C. A. Pigott, architect, Saxon Chambers, London Road, St. Leonards.

**HASTINGS.**—Nov. 24.—For alterations and additions to the public convenience, Rock-a-Nore Road. Mr. P. H. Palmer, borough engineer, Town Hall, Hastings.

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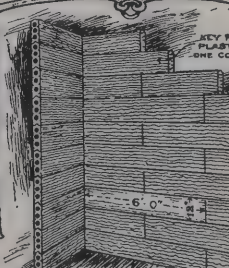
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**HAXBY.**—For alterations and additions to schools, Haxby, Yorks. Mr. E. T. Felgate, architect, 3 Stonegate, York.

**HECKMONDWIKE.**—Nov. 24.—For supply and erection of a water-tube boiler and accessories at the electricity works. Mr. Geo. H. Carter, electrical engineer, Engineer's Office, Power Station, Heckmondwike.

**HULL.**—Nov. 28.—For erection of a car-shed 340 feet by 47 feet on the Hedon Road. Mr. A. E. White, city engineer, Town Hall, Hull.

**IRELAND.**—Nov. 24.—For alterations, repairs, &c., at the school premises in Parliament Street and the Model school, Kilkenny. Mr. E. O'Connell, town clerk, Kilkenny.

**IRELAND.**—Dec. 1.—For erection of bank premises at Kilkenny, for the Hibernian Bank, Ltd. Messrs. William H. Byrne & Son, architects, 20 Suffolk Street, Dublin.

**IRELAND.**—Dec. 1.—For erection of the Rev. Br. Burke Jubilee memorial, Our Lady's Mount, Cork. Mr. Saml. F. Hynes, architect, 21 South Mall, Cork.

**IRELAND.**—Dec. 1.—For erection of a church, Aughnacloy, co. Tyrone. Messrs. Doolin, Butler & Donnelly, architects, Dawson Chambers, Dublin.

**IRELAND.**—Dec. 6.—For alterations to Castledawson Presbyterian church, Belfast. Mr. Thomas Houston, architect, Kingscourt, Wellington Place, Belfast.

**KENDAL.**—Nov. 27.—For erection of house at Stricklandgate, Kendal. Mr. John F. Curwen, architect, Highgate, Kendal.

**LEEDS.**—Nov. 22.—For erection of seven houses and two shops, Trentham Street, Dewsbury Road. Messrs. James Charles & Sons, architects, 98 Albion Street, Leeds.

**LONDON.**—Dec. 1.—For fitting-up, &c., of a chemical and physical laboratory, science lecture-room, preparation-room and master's-room at the Christ's College, Finchley. Mr. E. H. Lister, clerk, Finchley Hall, Finchley, N.

**LONDON.**—Dec. 2.—For erection of stables near West Ealing, Middlesex, for the Great Western Railway Company. Mr. G. K. Mills, secretary, Paddington Station, London.

**LONDON.**—Dec. 11.—For erection of the superstructure of the Victoria and Albert Museum at South Kensington, for the Commissioners of H.M. Works and Public Buildings. All information may be obtained at H.M. Office of Works, Storey's Gate, Westminster, S.W.

**MANCHESTER.**—Nov. 28.—For supply and delivery of fire-clay goods required during next season at the several gasworks. Mr. C. Nickson, superintendent, Gas Offices, Town Hall.

**MANCHESTER.**—Nov. 29.—For erection of a cast-iron ammonia water storage tank and work in connection therewith. Mr. C. Nickson, superintendent, Gas Department, Town Hall.

**MONTE VIDEO.**—Dec. 15.—For the sanitary works to be carried out in Monte Video harbour. Works offered for tender include the following:—(a) A rock tunnel, 1,278 metres in length, 3m. 65 in height, and 3m in width; (b) a main collector, 1,557 metres 60 by 1,283m. 30 in length, oval profiles 1'80m. and 1m. 70 in height respectively; (c) a secondary collector 2,016m. in length, varying its oval profiles from 1'70m, 1m. 25, and 0m. 98 in height; (d) the auxiliary collectors, affluents, &c. Plans, estimates and general conditions can be had in Monte Video by applying to the "Ministerio de Fomento," and through the respective Legations in Europe. Tenders made in Europe through the Legations in the above-mentioned countries should be handed to the said Legations at least one month before the mentioned date. Plans, &c., may be seen at the offices of the Consulate-General of Uruguay, Edinburgh Mansions, Howick Place, Victoria Street, S.W.

**MORLEY.**—Nov. 24.—For alterations to business property and dwelling-houses, Chapel Hill and Bank Street, Morley, Yorks. Mr. W. E. Putman, borough surveyor, Town Hall.

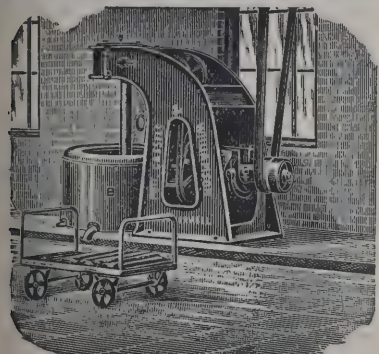
**NEWCASTLE-ON-TYNE.**—Nov. 29.—For supply of furniture, ironmongery and stable requisites for the new East End police-station. Particulars on application to the Chief Constable's office, Pilgrim Street.

**NORTH SHIELDS.**—Nov. 27.—For extension of the Queen Victoria Schools, Coach Lane, North Shields. Messrs. Marshall & Tweedy, architects, 17 Eldon Square, Newcastle-on-Tyne.

**OUGHTIBRIDGE.**—Nov. 27.—For construction of about 1,237 yards of 12-inch and 53 yards of 9-inch pipe-sewer through the fields of the South Yorkshire Asylum at Middlewood and in Forge Lane, Oughtibridge. Mr. G. E. Beaumont, Council engineer, Grenoside, near Sheffield.

**PRESTON.**—Nov. 27.—For construction of a public convenience at junction of Friargate and Moor Lane. Particulars may be obtained at the office of the Borough Surveyor, Town Hall, Preston, Lancs.

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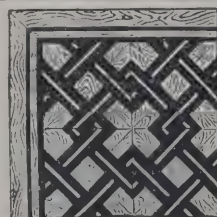
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**PRESTON.**—Nov. 27.—For erection of mortuary and post-mortem room at the police-station, Lancaster Road. Particulars may be obtained at the office of the Borough Surveyor, Town Hall, Preston.

**RHODESIA.**—Feb. 26.—For establishment and working of an electric tramway system, Bulawayo. Messrs. Davis & Soper, 54 St. Mary Axe, London, E.C.

**ST. ALBANS.**—Nov. 24.—For erection of a pavilion in the Clarence Park recreation ground. Mr. A. H. Debenham, town clerk, St. Albans.

**ST. AUSTELL.**—Nov. 26.—For erection of a cows' house and other buildings at Higher Trewiddle, St. Austell. Mr. T. H. Andrew, architect, 1 Trevarrick Villas, St. Austell.

**SCOTLAND.**—For erection of a house at Murtle, Aberdeen. Messrs. Sutherland & Pirie, architects, Aberdeen.

**SCOTLAND.**—Nov. 25.—For constructing a store reservoir on the Cae Water, and accompanying works, about three miles from Dalry railway station, Ayrshire. Messrs. J. & A. Leslie & Reid, engineers, 72A George Street, Edinburgh.

**SCOTLAND.**—Nov. 29.—For erection of a villa in West Road, Elgin. Messrs. Sutherland & Jamieson, architects.

**SHEFFIELD.**—Dec. 5.—For erection of buildings to the technical department of the University College in Charlotte Street and Broad Lane, Sheffield. Messrs. Gibbs & Flockton, architects, 15 St. James's Row, Sheffield.

**SKEGNESS.**—Nov. 28.—For erection of a factory manager's house, &c., at Skegness, Lincs. Mr. Jesse Clare, architect, Sleaford.

**SOUTHAMPTON.**—For excavation and foundations for the new electricity station at the Western Shore, Southampton. Particulars can be obtained at the Borough Engineer's office.

**SOYLAND (YORKS).**—Nov. 25.—For erection of a mason's wall, about 200 yards long and 5 feet high from the surface of the road, at Blackhouse reservoir. Mr. John Wadsworth, surveyor, Rippendon.

**SUNDERLAND.**—Nov. 28.—For supply of one steam-driven three-phase generator, motor generators and static transformers and high and low tension switchboards. Mr. J. F. C. Snell, electrical engineer, Town Hall, Sunderland.

**TAVISTOCK.**—Nov. 25.—For rebuilding the Manor House at Warne farm, Marytavy, Tavistock. Mr. Horace W. Collins, architect, Redruth.

**UPHOLLAND.**—Dec. 1.—For construction of a covered service water reservoir, and the erection of an engine-house and workshop. Copies of specifications and forms of tender may be obtained from the Surveyor upon returnable deposit of one guinea.

**WALES.**—For erection of thirty-six cottages at Mountain Ash. Messrs. Morgan & Elford, architects, Mountain Ash.

**WALES.**—Nov. 24.—For erection of a mixed school at Danygraig, Risca, Mon. Mr. Ernest N. Johnson, architect, Risca.

**WALES.**—Nov. 25.—For construction of electric light main, fittings, arc lamps and standards, incandescent lamps and fittings, sub-station fittings, and other works. Mr. Herbert Thomas Sully, consulting engineer, Scottish Widows' Buildings, Bristol.

**WALES.**—Nov. 26.—For erection of the Hafod school, Swansea. Mr. G. E. T. Laurence, architect, Chandos Chambers, Buckingham Street, Adelphi, W.C.

**WALES.**—Nov. 26.—For erection of a vestry at Edwardsville, near Treharris. Mr. W. Dowdeswell, architect, Bryntaff, Treharris.

**WALES.**—Nov. 27.—For renewals and repairs to the Cogan pumping-station's engines and boilers, Cardiff. Mr. C. H. Priestley, waterworks engineer, Town Hall.

**WALES.**—Dec. 6.—For reconstruction and alteration of the Methodist chapel, Llansawel. Mr. David Jenkins, architect, Llandilo.

**WALES.**—Dec. 15.—For adding a third lift (100 feet diameter by 24 feet deep) to the present two-lift holder at the Treforest, Pontypridd, gasworks. Mr. Edward Jones, engineer, Treforest.

**WALLSEND.**—Nov. 24.—For erection of retaining walls in Camp Road and Hunter's Road, Wallsend. Mr. George Hollings, borough surveyor, Corporation Office, Wallsend.

**WALSALL.**—Dec. 6.—For erection of a junior mixed department and enlargement of the present buildings at Palfrey school, Walsall. Messrs. Bailey & McConnal, architects, Bridge Street, Walsall.

**WANDSWORTH.**—Dec. 1.—For erection of buildings and other works at Waterside Wharf, Jews Row. Particulars may be obtained at the Surveyor's Office, 215 Balham High Road, S.W.

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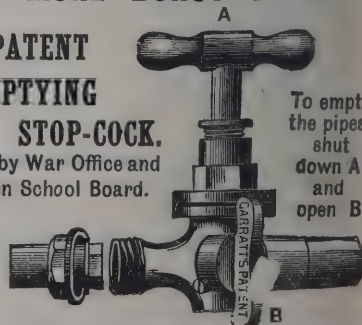
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**WEST CHILTINGTON.**—For erection of three pairs of cottages at Hatch's farm, West Chiltington, near Pulborough, Sussex. Mr. W. Ralph Low, architect, Clarence Street, Staines, Middlesex.

**WEST HAM.**—Nov. 25.—For street works in Glasgow Road, Tweedmouth Road, Stirling Road, Dundee Road, Edinburgh Road, Southern Road (part). Mr. John C. Morley, borough engineer, Town Hall.

**WEST NORWOOD.**—Nov. 26.—For erection of a porter's lodge at Crown Hill. Mr. W. Thurnall, clerk, Brook Street, Kennington Road, S.E.

**WHITBY.**—For alterations to the shelter near the coastguard station. Mr. T. Keat Scott, Whitby.

**WOLVERHAMPTON.**—Nov. 26.—For keeping in good repair the fabric and furniture of the schools. Mr. T. H. Fleeming, architect, 10 Queen Square, Wolverhampton.

## FOREST GATE PUBLIC HALL.

THE new public hall which was opened at Forest Gate on the 1st inst. will add very materially to the amenities of that rapidly growing district. Erected from designs by Mr. Acoc, architect, of Wormwood Street, E.C., the new building is of a thoroughly practical and up-to-date character. A small proportion only of the cost, which amounts in the aggregate to some 7,000*l.*, has been expended on ornament, but nevertheless the architect, aided by the excellent workmanship of the contractors, Messrs. John Barker & Sons, Ltd., of High Street, Kensington, and the capital materials employed, has succeeded in putting up a very pleasing and commodious structure. The simple but effective elevation is in red brick, and the accommodation provided comprises a large and lofty main hall, capable of seating 1,000 people. This is provided with a completely fitted stage at one end and a gallery at the other; the hall is effectively decorated in shades of green, it has parquet flooring, is electrically lighted, and warmed by means of radiators. There is an equally well-proportioned smaller hall, which would, perhaps, accommodate 300 persons, and several conveniently arranged club and retiring-rooms. In the light, dry and roomy basement are situated kitchens, heating chamber, stores and bicycle stables, &c., and some adjoining land is being laid out as a garden, with tennis courts, &c.

## TENDERS.

### ASHFORD.

For additions to coal store and erection of a fitter's shop at the Henwood waterworks pumping station. Mr. Wm. TERRILL, surveyor.

G. F. Davis . . . . .	£398 15 0
D. Godden & Son . . . . .	339 10 0
J. DAY, Ashford (accepted) . . . . .	324 17 0

### BARNESLEY.

For erection of outbuildings and conveniences at the Locke Park. Mr. J. HENRY TAYLOR, borough surveyor.

P. DALBY, Barnsley (accepted) . . . . .	£122 6 0
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### BELFAST.

For extension of the present goods shed on the west side of York Dock, for the Belfast Harbour Commissioners.

W. J. CAMPBELL & SON, Ravenhill Road (accepted).

### BILSTON.

For alterations and extensions of Lower Gornal Robert Street infants' school, Coseley. Mr. A. RAMSELL, architect, 187 Wolverhampton Street, Dudley.

J. Herbert . . . . .	£1,586 0 0
Hilton & Caswell . . . . .	1,495 0 0
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### BRENTWOOD.

For diversion of the main sewer in James Place, Brentwood, Essex. Mr. J. E. FOTHERGILL, surveyor.

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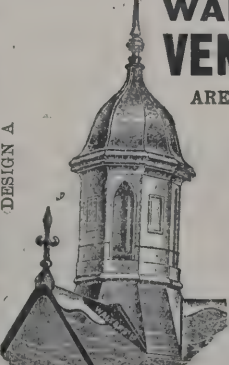
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W. Bell	222	5	6
J. ANDERSON, Coxhoe, R.S.O., co. Durham, (accepted)	209	17	0

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For sewerage works, with manholes, lamp-holes, road gully pits, &amp;c., at Townstal Road and Ridge Hill. Mr.

ARTHUR SMITH, borough engineer.

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S. J. Clothier	338	9	2
R. H. Watts	264	15	0
H. C. Goss	265	0	0
R. C. PILLAR, Dartmouth (accepted)	246	17	6

**DONCASTER.**

For erection of new classrooms at the Doncaster Wesleyan schools, Oxford Place. Mr. E. H. BALLAM, architect, Oriental Chambers, Doncaster.

Randerson & Close	£1,497	0	0
J. Flowitt	1,300	0	0
R. Stewart	1,272	6	6
A. E. Pearce	1,061	2	6
D. Gill & Son	1,057	0	0
SPRAKES & SONS, Doncaster (accepted)	985	0	0

**EVERSLEY.**

For construction and erection of a steel platform with parapets to Eversley bridge. Mr. W. J. TAYLOR, county surveyor

St. Pancras Ironworks Co.	£875	0	0
Somervail & Co.	550	0	0
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For erection of a detached house in Woodbury Road. Mr. ERNEST E. ELLIS, architect, Exmouth. Quantities by the architect.

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Woodman & Son	1,540	0	0
W. H. Perry	1,450	0	0
H. Dart	1,445	0	0
Westcott, Austin & White	1,428	0	0
W. H. Chown	1,301	0	0
H. GOULD, Topsham (accepted)	1,245	0	0

**Plumbing.**

HUBBER &amp; SON, Exeter (accepted).

**Outbuildings.**

J. J. LACEY, Exmouth (accepted).

**Well.**

N. PRATT, Clyst St. Mary (accepted).

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GODFREY &amp; SYMES (accepted).

**FEATHERSTONE.**

For streetwork in Bank Street and Pretoria Street. Mr. F. B. ROTHERA, surveyor.

G. CLEMENTS, Featherstone Lane, Featherstone, Yorks (accepted).

**GOLCAR.**

For erection of a house and shop at Town End, Golcar, Yorks.

Mr. ARTHUR SHAW, architect, Golcar.

W. Whitwam, Golcar, mason.

R. White, Golcar, joiner.

T. Allison, Milnsbridge, plumber.

A. Ainley, Golcar, painter.

For erection of a weaving-shed and warehouse (floor area 25,582 square feet) at Stanley Mills, Golcar, Yorks. Mr. ARTHUR SHAW, architect, Golcar.

Walker Bros., Golcar, mason and bricklayer.

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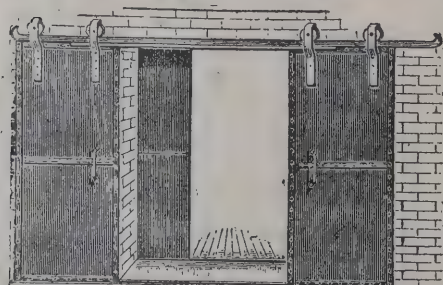
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FITZMAURICE & Co., Birmingham (accepted)	1,519	0	0
A. Ford	1,263	0	0

**HARROGATE.**

For street works in Newnham Terrace, Back Newnham Terrace, Stonefall Avenue (continuation). Mr. F. BAGSHAW, borough surveyor.

*Accepted tenders.*

Dickinson & Long (Stonefall Avenue, continuation)	£510	3	6
B. Oxley (Newnham Terrace)	298	3	1
J. Frost (Back Newnham Terrace)	156	3	10

**HARROW-ON-THE-HILL.**

For street works in Hindes Road. Mr. J. PERCY BENNETTS, engineer and surveyor.

C. Ford	£2,370	0	0
Bracey & Clarke	1,935	0	0
T. Adams	1,906	0	0
T. Free	1,921	0	0
E. W. Hollingsworth	1,896	0	0
P. Saunders	1,799	0	0
H. BROWN, Watford (accepted)	1,745	0	0

**HEBBURN-ON-TYNE**

For construction at Hebburn of a 24-inch pipe sewer. Mr. W. CURRY, surveyor.

J. Thompson	£123	15	0
T. Callaghan	105	0	0
G. E. Simpson	98	12	6
J. Hollings	98	0	0
T. Brown	97	10	0
G. THORNTON & Co., South Shields (accepted)	88	0	0
Glen & Moffitt	87	7	0

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For laying about 200 yards of 4-inch and about 83 yards of 3-inch water-mains. Mr. G. W. THOMPSON, surveyor.

C. G. CALVERT, German House, Lightcliffe, near Halifax, 1s. 6d. per yard (accepted).

**HUDDERSFIELD.**

For erection of an engine-house at Commercial Mills. Mr. J. BERRY, architect, 3 Market Place, Huddersfield.

*Accepted tenders.*

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F. Greensmith, Kirkheaton, joiner.  
J. Roebuck, plumber and plasterer.  
J. Preston & Son, painter.  
W. E. Jowitt, slater.  
J. Cooke, concreter.  
Rest of Huddersfield.

**LEAVESDEN.**

For erection of a new isolation hospital at Leavesden asylum, Herts.

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Clark Bros.	2,296	0	0
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T. Cole	2,283	0	0
J. Honam & Son	2,263	0	0
G. & J. Waterman	2,250	0	0
E. H. Cripps	2,249	5	10
General Builders, Ltd.	2,247	0	0
F. Dupont & Co.	2,232	0	0
C. Brightman	2,200	0	0
G. WIGGS, 90 and 92 St. Albans Road, Watford (accepted)	2,189	0	0

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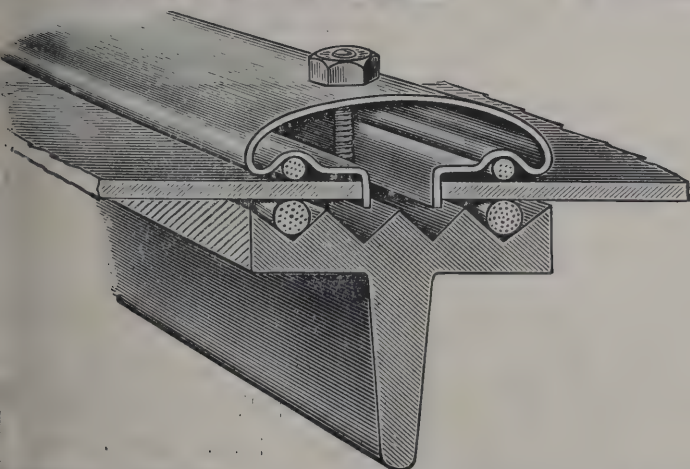
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## LAMBETH.

For constructing external fire-escape staircases at the Elder Road schools, West Norwood. Messrs. WOODWARD BROOKS & LATTER, surveyors, 69 The Oval, Kennington, S.E.

Peirson & Co.	£1,505	18	2
W. Wright & Co.	1,430	0	0
J. Blachford & Sons	1,375	0	0
R. H. & J. Pearson	1,351	10	0
J. R. Richardson & Co.	1,263	0	0
H. Hammond & Son	1,238	0	0
J. Stone	1,198	0	0
Perry Bros.	1,197	0	0
H. Kent	1,133	0	0
Hayward Bros. & Eckstein, Ltd.	1,105	0	0
St. Pancras Ironwork Co.	1,070	0	0
J. Parsons	1,045	0	0
Barry & Highman	1,040	0	0
J. & F. May	1,039	0	0
J. O. Brettle	985	18	3
Wenham & Waters, Ltd.	982	0	0
Herring & Son	977	8	0
W. A. Baker & Co., Ltd.	845	0	0
E. Wall	845	0	0
Jones's Ironfoundries & Engineering Co.	831	0	0
Safety Tread Syndicate	818	10	0
T. W. Palmer & Co.	813	0	4
A. E. Wood	755	5	5
H. & G. MEASURES, Croydon (accepted).	724	12	5

## LONDON.

For building, &c., works at North Wharf, for the Metropolitan Asylums Board.

H. Shepherd	£238	0	0
J. F. Holliday	189	10	0
W. C. Reeder & Co.	172	10	0
W. Biggs & Son	172	6	0
Marsh, Tucker & Son	165	0	0
R. Woollaston & Co.	160	0	0
W. Gray & Co.	160	0	0
E. Mills	117	0	0
P. McCarthy	117	0	0
Seed Bros.	115	0	0
HALL & SON, 298 Whightman Road, Hornsey (accepted)	113	16	0

## LONDON—continued.

For repairs to chimney-shaft at the Park hospital.

D. Broadbent & Co.	£182	10	0
W. C. Reeder & Co.	155	10	6
Stephens, Smith & Co., Ltd.	120	0	0
W. Hogg & Son	110	0	0
Blackburn, Starling & Co., Ltd.	97	0	0
G. Drake	94	4	0
UNIVERSAL ENGINEERING CO., Collin Street, Nottingham (accepted)	81	10	0
A. Nevins & Co.	79	17	6

## MAIDENHEAD.

For wiring the Guildhall for electric light.

W. H. ARUNDEL (accepted)	£140	18	0
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## MANSFIELD.

For wiring the town hall premises for electric light.

MANSFIELD ENGINEERING CO., Pelham Street (accepted).	£104	1	0
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## MARKET HARBOROUGH.

For sewerage works with manholes, ventilators, &c. Mr. J. B. EVERARD, engineer, 6 Millstone Lane, Leicester.

S. Saunders	£2,889	15	2
R. Wood	1,781	0	0
W. Jones & Sons	1,698	0	0
A. Jewell	1,633	12	6
C. Chamberlain	1,479	0	0
T. Philbrick	1,470	0	0
T. Smart	1,332	5	0
J. H. Smedley	1,261	14	1
W. G. Wilmott	1,260	0	0
J. T. Wingrove	1,254	0	0
G. H. Eastwood	1,212	19	3
J. Holme	1,193	10	2

## MIDDLETON.

For street works in Norman Street and Lomas Street.

Ogden & Hollowell	£680	0	0
R. Heard	671	0	0
R. PARTINGTON & SON, Middleton (accepted)	667	0	0

## NEW ROMNEY.

For painting and repairs at the hospitals situate at the Warren, New Romney, Kent.

W. GOODSSELL, New Romney (accepted)	£11	10	0
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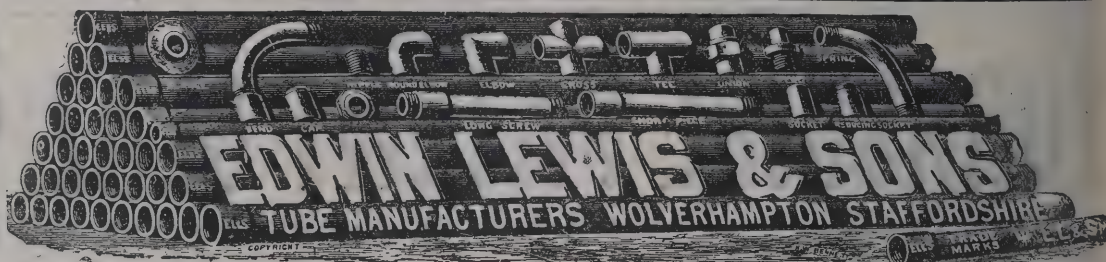
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OXFORD.

For new entrance-tower to Radley College, Oxford. Mr. ARTHUR H. RYAN TENNISON, architect, 12 Little College Street, Westminster, S.W.  
HUTCHINS, Oxford (accepted).

PARKESTON.

For erection of new schools for 510 children, and alterations and additions to present schools at Parkeston. Mr. J. W. START, F.S.I., architect.

W. Chambers	£6,336	0	0
Dupont & Co.	6,190	0	0
F. Bennett	6,050	0	0
S. Wiles & Son	6,002	0	0
J. McKay	5,540	0	0
A. W. Robins	5,510	0	0
Smith & Beaumont	4,791	0	0
E. Saunders	4,790	0	0
W. C. THEOBALD, Chappel (accepted)	4,637	0	0

PETERBOROUGH.

For draining and laying-on water-supply to thirty-nine cottages at Stanground.

D. Hayward	£215	0	0
J. Guttridge	189	0	0
R. Wright	181	15	0
Thurley Bros.	172	0	0
Hawkins & Sons.	170	0	0
KETTLE & SON, Peterborough (accepted)	148	9	0

PLYMOUTH.

For supply of gasfittings to schools in course of erection at Salisbury Road and Laira Green.  
SOUTH-WESTERN BRASSFOUNDRY, LTD., Russell Square (accepted) £169 12 7

POPLAR.

For a 12-inch boring, being an extension of a well 14 feet deep and 4 feet in diameter, in the pump-room of the engineering works at High Street, Poplar.  
W. BROWN & SON, 709 High Road, Tottenham (accepted) £60 18 0

PRESTON.

For widening Standish (County) Bridge, Preston, Lancs.  
R. HALL, Torton, near Garstang, Lancs (accepted).

ROCHDALE.

For supply and fixing of 236 cast-iron fence posts and 4,038 lineal feet of 1½-inch galvanised wrought-iron tube rail, at Newbold Recreation Ground, Dodgson Street. Mr. S. S. PLATT, borough surveyor.  
J. J. SMITHIES, Livesey Street (accepted).

SHREWSBURY.

For construction of a 9-inch pipe sewer, manholes and other works in connection therewith. Mr. W. CHAPPLE EDDOWES, borough surveyor.  
C. HARRIS, Shrewsbury (accepted) £177 0 0

STOCKPORT.

For erection of an addition to the tramcar sheds at Mersey Square. Mr. JOHN ATKINSON, borough surveyor.

W. B. Broadhurst	£1,475	0	0
D. Eadie	1,327	0	0
H. Bardsley	1,289	10	0
D. Mullaney	1,237	0	0
W. Pownall	1,213	16	10
J. Briggs	1,186	0	0
T. & W. MEADOWS, Georges Road (accepted)	1,177	0	0

SWINDON.

For laying the 12-inch water-main from the well at Whitefield farm, Ogbourne St. George, to Overtown reservoir, Wroughton.  
J. RILEY, Gloster Road, Cheltenham (accepted) £971 11 6

TROWBRIDGE.

For sewerage works. Mr. H. G. NICHOLSON-LAILEY, town surveyor.

G. G. Rayner	£5,133	0	0
F. W. Trimm	4,913	0	0
J. H. Ash	4,774	3	0
T. Street	4,768	10	1
S. Ambrose	4,692	13	2
A. Wills & Sons	4,600	0	0
Tryhorn & Sons	4,314	0	0
G. Bell	4,191	16	9
Binns & Sons	4,180	12	10
E. Linzey	4,034	13	0
S. Wood	4,032	4	4
S. Saunders	3,962	0	0
H. Roberts	3,822	18	9
J. RILEY, Gloucester Road, Cheltenham (accepted)	3,383	17	3

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owner's temporary absence.  
DEPOSIT BANK.—Money received on deposit for short  
periods at 2½ p.c. Interest.



**TROWBRIDGE—continued.**

For completion of an existing cattle bay in the cattle market and alterations to urinals at the town hall. Mr. H. G. NICHOLSON-LAILEY, town surveyor.

Trowbridge Sawmill Co.	£85	0	0
F. C. Cheverill	76	13	0
S. Wood	56	0	0
W. R. Moody	54	0	0
P. Isley & Co.	49	15	0
E. LINZEY (accepted)	45	0	0

**WALES.**

For erection of a mixed and infants' school (to accommodate about 400) at Ystradgynlais. Mr. PHILIP WILLIAMS, Tyr Gorof, Ystradgynlais.

T. Griffiths	£3,775	0	0
D. Rees	3,732	0	0
E. THOMAS, Seven Sisters, Neath (accepted)	3,711	0	0

For street works in Tunnel Terrace and Gwynfi Street, Blaen-gwynfi. Mr. W. P. JONES, surveyor, Cymmer, Port Talbot.

M. Thompson	£940	0	8
S. Reeves	760	10	0

BARRY BUILDING & CONTRACTING SOCIETY, LTD., Barry (accepted)

752 19 2

For erection of additions to the Penclyn schools, Llangyfelach Mawr. Mr. W. DAVID, architect, 97 Gorse Lane, Swansea.

Lloyd Bros.	£2,061	0	0
Thomas & Walters	1,860	0	0
T. Richards	1,820	0	0
H. Billings	1,820	0	0
D. Jenkins	1,800	0	0
Walters & Johns	1,780	0	0
J. C. Howells	1,753	2	1

**WEST MOLESEY.**

For sewerage works in the parish of West Molesey, Surrey. Mr. J. STEVENSON, engineer, East Molesey.

S. Kavanagh & Co.	£2,306	19	11
G. Bell	1,702	15	5
F. W. Trimm	1,569	0	0
Free & Sons	1,486	0	0
E. Potterton	1,471	6	6
E. PARRY & CO, 125 High Street, Putney (accepted)	1,229	15	7

**WHITEHAVEN.**

For additions to the bowling-green at the Whitehaven Colliery recreation-ground, Coach Road, Whitehaven.

M. LOWE, 8 George Street, West End, Stoke-on-Trent (accepted)

£85 0 0

**WILLENHALL.**

For street works in Rose Hill and Wood Street, Willenhall, Staffs. Mr. T. EDGAR FELLOWS, engineer and surveyor.

**Rose Hill.**

H. Holloway	£382	17	4
J. Owens	348	0	0
W. H. Reading	339	13	10

G. TRENTAM, 24 Heathfield Road, Handsworth, Birmingham (accepted)

300 0 0

**Wood Street.**

H. Holloway	132	13	11
W. H. Reading	123	7	0
J. Owens	119	0	0
G. TRENTAM (accepted)	110	0	0

**WOOLWICH.**

For erection of the first portion of new cable factory at North Woolwich. Messrs. ARDRON & DAWSON, architects, 6 Old Queen Street, Westminster, S.W.

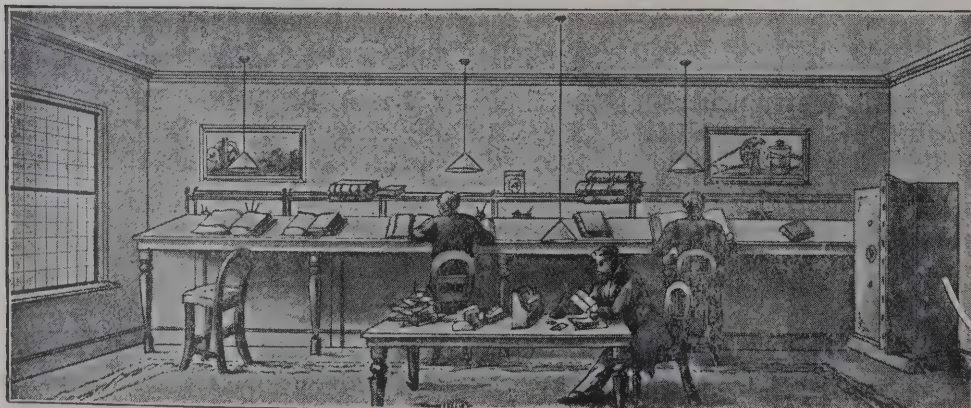
Mowlem & Co.	£23,159	0	0
Foster & Dicksee	22,844	0	0
Holloway Bros.	22,110	0	0
Holland & Hannen	21,705	0	0
Downs	21,229	0	0
Higgs & Hill	20,973	0	0
Lawrence & Sons	20,955	0	0
Lovatt & Roberts	20,500	0	0
Kirk & Randall	20,377	0	0
Holliday & Greenwood	20,377	0	0
Patman & Fotheringham	20,173	0	0
Chessum & Sons	19,997	0	0
GROVER & SON *	19,734	0	0
Shaw & Co., ironwork	3,200	0	0
C. Newman, pile driving	1,598	0	0
Aiton & Co, fire-mains	853	7	0

\* Accepted, subject to reduction, at 18,402/.

# WILSON'S PATENT "MULTILUX" WINDOWS



The above illustrates an office where the light coming from the sky falls on to the floor and is absorbed, thus leaving the back part of the room dark. The illustration below shows the same room with WILSON'S PATENT MULTILUX WINDOW fixed. This refracts the rays of light and throws them horizontally, thus preventing them falling on to the floor, and lighting up the whole room.

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Lights prevent slipping

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THE TEA HOUSE, REIGATE HILL, SURREY.

BURTON COURT, SLOANE SQUARE.

DACRE HOUSE, WESTMINSTER.

THE GREAT HALL, STATIONERS' HALL, LUDGATE HILL.

*Received too late for Classification.*

## CONWAY BRIDGE.

For replacing the suspension rods and cables and putting in strengthening girders and a 6-feet footway on the seaward side of the bridge.

A. THORNE, Westminster (accepted) . . . £5,600 0 0

## HULLAVINGTON.

For erection of the Star inn. Mr. ROBERT BRINKWORTH, architect, Old Broad Street, Bath.

Downing &amp; Rudman . . . £1,467 0 0

J. SMITH, Chippenham (accepted) . . . 1,440 15 0

## LAMBETH.

For repainting the interior iron and woodwork of repairs to the exterior of the Lambeth public baths. Mr. HENRY EDWARDS, borough engineer.

CHUDLEIGH BROS., 202 Blythe Road, West Kensington (accepted) . . . £102 0 0

## LONDON.

For alterations and additions to Messrs. Sim &amp; Randall's auction mart, 280 Romford Road, Forest Gate, E. Mr. P. G. ASHTON, architect, Bank Buildings, 304 Romford Road, Forest Gate, Ilford, E.

H. C. Horswill . . . . .	£250	0	0
J. Gregory . . . . .	220	17	0
A. B. Hill . . . . .	220	0	0
H. HARDIE & Co. (accepted) . . . . .	198	12	0

## MENHENIOT.

For extension of mill building and erection of new buildings for St. Mary's Lead Works, Ltd. Mr. B. ANGWIN, engineer. Quantities by Mr. B. ANGWIN.

J. C. Lang . . . . .	£120	0	0
JOSEPH LAUNDRY, Menheniot (accepted)* . . . . .	97	0	0

\* To complete December 20, 1902.

## SIDCUP (KENT).

For new school for the Greenwich Union Guardians in connection with the Children's Homes. Messrs. T. DINWIDDY &amp; SONS, architects, Greenwich, and 54 Parliament Street, Westminster. Quantities by Mr. L. JACOB.

Foster & Dicksee . . . . .	£16,500	0	0
Killby & Gayford . . . . .	15,538	0	0
B. E. Nightingale . . . . .	15,238	0	0
Thomas & Edge . . . . .	15,160	0	0
W. Shepherd . . . . .	15,038	0	0
Wallis & Son . . . . .	14,583	0	0
Holliday & Greenwood . . . . .	14,457	0	0
C. Wall . . . . .	14,400	0	0
T. Knight . . . . .	14,290	0	0
T. Rowbotham . . . . .	14,268	0	0
J. Lonsdale . . . . .	14,261	0	0
H. L. Holloway . . . . .	14,200	0	0
J. J. Wise . . . . .	13,990	0	0
T. D. LENG, Deptford (accepted) . . . . .	13,320	0	0

MESSRS. BARRETT &amp; DRIVER, architects and surveyors, announce that they have removed from Blomfield Road, Maida Vale, to 23 York Place, Baker Street, W.



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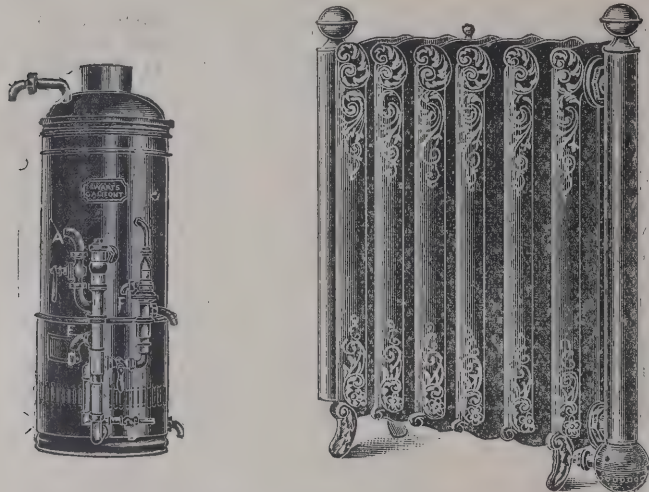


**EWART'S GEYSERS.**

At this time of the year attention turns to the question of the hot water service, which, while sufficient in the summer months, is often inadequate in the cold weather.

A ready manner to increase the existing arrangements without considerable expense is to install one of Ewart's geysers. The "Lightning" geyser provides hot water instantly required (whether night or day) without any waiting, and as the water is heated while passing through the machine the supply is unlimited.

An important departure from the ordinary geyser is the "Califont." This machine is constructed to supply hot water instantly to any part of the house, and as it is made to withstand the pressure of the cold water main, it can be placed in the basement or in any out of the way position. The "Califont" will be found very economical in use, as the gas is only full on while hot water is being withdrawn from any of the draw-off taps, and as soon as the tap is closed the gas is lowered to a small by-pass.



A great advantage with the "Califont" is that it may be connected to existing hot-water pipes already in the house. Another new apparatus is the "Euston" radiator, which is

particularly suitable for warming halls, offices, rooms, passages, &c. It requires connection only to small gas supply, occupies little space, requires no attention and gives excellent results.

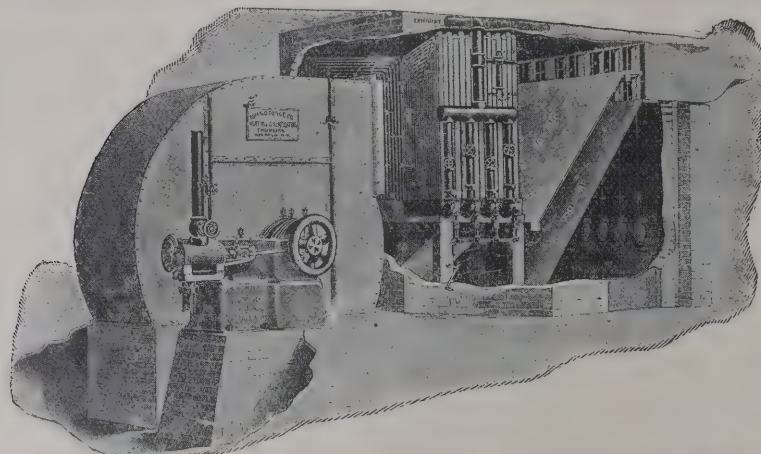
Messrs. Ewart & Son, Ltd., have issued recently a new and complete catalogue of smoke-curing appliances. Special



attention is drawn to the "Empress" smoke cure, which has been found very successful in curing smoky chimneys in the most difficult positions.

An inquiry addressed to Messrs. Ewart & Son, Ltd., 346-350 Euston Road, will receive prompt attention, and catalogues of their different specialties will be forwarded post free on application.

MR. M. K. NORTH, inspector of the Local Government Board, held an inquiry on Tuesday at the Widnes town hall into the application of the Town Council to borrow 1,200l. for the reconstruction of the central outfall sewer. The town clerk (Mr. H. S. Oppenheim) explained that the application arose out of a report of the borough surveyor in April last. The report stated that several of the pipes were broken, and that the majority of the joints were open, some as much as 3 inches. The surveyor was called, and said it was proposed to reconstruct the defective portion of the sewer on a timber pile and concrete foundation.

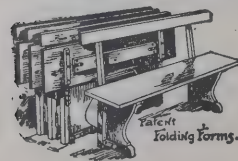


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Patent Automatic Chairs.

Entire Seating of a Hall folded flat round  
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Entire satisfaction where in use.

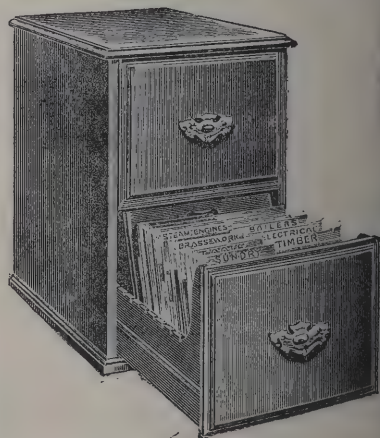
15 per cent. more seated.

Increased Revenue.

Rows can be spaced 24 in. apart.

Pack away into minimum space.

Prices, Particulars, and Samples of all above on Application.

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Architect  
should have.****Catalogue Filing Cabinet.**

Takes any Catalogue up to 11 $\frac{3}{4}$ " x 9",  
with Adjustable Rack to Drawers.

As above, 57/6, or made to order to any size.



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**Partridge & Cooper, Ltd.**  
1 & 2 Chancery Lane, London, E.C.



**TRADE NOTES.**

MESSRS. ANDREW HANDYSIDE & CO., LTD., of Derby, have secured the contract for the iron roof over the new vegetable market at Lancaster.

MESSRS. WM. POTTS & SONS, clock manufacturers, Guildford Street, Leeds, have erected a new hour-striking clock in the tower of Holy Trinity Church, Boar Lane, Leeds, for the vicar, churchwardens and trustees.

THE Wellington hospital, New Zealand, is being warmed and ventilated by means of Shorlands' double-fronted patent Manchester stoves, grates, exhaust roof-ventilators and inlet tubes, by Messrs. E. H. Shorland and Brother, of Manchester.

MESSRS. HODKIN & JONES, LTD., Havelock Bridge Works, Sheffield, are supplying their "H. & J." patent plaster partitions to the premises now being erected in Sheffield for the York City and County Bank (Messrs. Demine & Brierley, York, architects), they having been adopted for use throughout the building.

THE COLUMBIAN FIREPROOFING CO., LTD., 37 King William Street, have completed their contract for fireproof floors and roof at the large building for the Bon Marché, Brixton, Mr. J. B. Chapman, architect, and their estimate has just been accepted for the L. C. & M. Bank, Richmond, for the fireproof floors. This makes the twenty-second bank in which their construction has been adopted for this Corporation.

**BUILDING AND BUILDERS.**

THE memorial-stones of a new Baptist church situated on the Pear Tree Road, Derby, have been laid.

THE foundation-stones of a new Unitarian church in Lytham Road, South Shore, Blackpool, were laid on Saturday.

THE foundation-stone of a new portion of St. Giles's Church, Normanton, near Derby, was laid on Saturday. The estimated cost of the enlargement is 3,500*l*.

THE new Grimsby dock scheme is to be at once proceeded with and Parliamentary powers are to be asked for during this session. It is proposed to construct a light railway from Grimsby to the dock, which is to be about 44 acres in area.

THE corner-stone of a mission church for Huddersfield, in the Primrose Hill district, was laid on Saturday. The church

will accommodate 360 people. It will be built of broken coursed stone, and the cost, including the making of a street, is put down at 3,250*l*.

MEMORIAL-STONES have been laid of a new church and school in connection with the Methodist New Connexion Church, Fairfield Road, Openshaw. The site of the new building is within a few yards from the main road leading from Manchester to Ashton-under-Lyne, and when completed it will have cost about 3,000*l*.

ON the 15th inst. the foundation-stone of a church for the Free Church of the Welsh was laid on a site in Claughton Road, Birkenhead. The building, which is from the plans of Mr. T. T. Rees, will when completed improve considerably the appearance of that portion of the road in which it is being erected. Its total cost, including the site, will be about 3,000*l*. There will be accommodation for between 500 and 600 persons, and there will also be three classrooms and two vestries. The contractor for the work is Mr. W. R. Holland.

AT the meeting of the house committee of the Chesterfield Board of Guardians the clerk reported that he had received an order from the Local Government Board authorising the Guardians to proceed with the erection of the temporary infirmary, and that the Court of Quarter Sessions had confirmed the order of the justices respecting the diversion of the footpath from Marsden Street to Spencer Street. Mr. W. C. Jackson, architect, wrote stating that he was getting out bills of quantities in connection with the work, and asked for an additional commission of 2½ per cent, but the committee resolved that the 5 per cent. fixed when Mr. Jackson was engaged was reasonable and sufficient.

**ELECTRIC NOTE.**

A LENGTHENED discussion took place at last week's meeting of the Kilmarnock Town Council regarding electric lighting and traction. The Council having acquired powers for lighting, the electric committee recommended that an application should now be made for powers under the Tramways Act, so that the two schemes might be put into operation concurrently. Mr. Wilson moved the adoption of the report, which was seconded by Mr. Matthew Robertson. Mr. Burnet moved as an amendment that the matter be delayed for further consideration, and Bailie Turnbull seconded. The amendment was adopted by twelve votes to eight.

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## VARIETIES.

THE Glasgow Corporation sewerage committee have agreed to borrow 600,000*l.* to carry out their sewage purification scheme, on the estimate for which there was a deficiency of 800,000*l.*

THE extensions to the Peebles Burgh and County High School, consisting of hall, art-room, combined workshop and cookery-room, janitor's house, &c., and built at a cost of 3,400*l.*, were formally opened on Saturday afternoon.

THE associate section of the Edinburgh Architectural Association held their annual dinner in Ferguson & Forrester's, 129 Princes Street, on the 13th inst. Mr. A. Percy presided over a party numbering over fifty. After the usual toasts had been pledged an excellent musical programme was submitted.

THE Local Government committee recommend that Mr. Sidney Webb should represent the London County Council on the committee appointed by the recent conference of municipal and other rating authorities to prepare a scheme for the rating of site values.

A PUBLIC elementary school has been opened in connection with St. Cuthbert's Church, Trafford Park, the incumbent of which is the Rev. Benjamin Davies. The premises consist of the mission church, the chancel being screened off, and accommodation is provided for 150 boys and girls.

MR. J. W. PLEWS, surveyor and sanitary inspector of the Wigmore (Herefordshire) Rural District Council, and formerly surveyor in the Pickering and Sherburn districts of Yorkshire, has been appointed to a like office by the Ripon Rural District Council.

AT Morecambe on Monday the new Central Board schools, which are finely equipped and have cost about 20,000*l.*, were opened by the chairman of the School Board, Dr. J. W. Watterson. The style is a combination of Gothic and Renaissance, and the exterior is entirely in stone. There are departments for art instruction, manual classes and other branches not immediately classed as technical. The schools give accommodation for about 1,100 children.

IN connection with the northern approach to the Tower Bridge, the First Commissioner of Works has notified that he is willing to arrange for a triangular plot of land in front of the main entrance to the Royal Mint to be given up to the public way, free of cost to the Council, instead of being, as now, reserved by the Government. This proposal will have the

effect of increasing the width of the thoroughfare at this part beyond the 80 feet already settled as the width of the remaining portion.

CHURCH halls in connection with St. Columba's Presbyterian Church of England, Smithdown Gate, Liverpool, were opened on the 13th inst. They have been built at a cost of 1,685*l.*, of which amount 1,150*l.* has still to be liquidated. The architects were Messrs. Woolfall & Eccles of Castle Street, and they have put up a building that will meet all the requirements of the church for some time to come. It contains in addition to a large hall a guild-room, several vestries, and a small meeting-room.

GENERAL SIR ARCHIBALD HUNTER, commanding the forces in Scotland, opened on Friday last new headquarters and drill halls which have been erected in Main Street, Bridgeton, in connection with the 3rd (Blythswood) Volunteer Battalion Highland Light Infantry. The building, which is of Dumfriesshire red stone, and is in the Late Gothic style of architecture, includes a front building with men's retiring-room, billiard-room, lecture-hall, &c.; a mid-building, 100 feet by 80 feet, to be used as a drill hall, and the old back building, in which provision is made for a Morris tube range.

AT a meeting of the Lancashire and Cheshire Antiquarian Society held in Chetham's Hospital, Mr. R. Falkner gave some particulars of St. Mary's Church, formerly in the Parsonage. He described the tower and the east window, and said the face of the foundation-plate was inscribed—"This spire was built by the voluntary subscriptions of ye inhabitants of Manchester in ye year 1762. The first stone was laid by Edward Byrom, Esq., borough-reave. The Rev. Mr. Downes, rector; I. Lightoler, architect;" whilst the reverse was engraved, "John Jackson, mason." With the approval of the Dean of Manchester and the rector and wardens of St. Ann's, the plate will, it was said, be fixed in the baptistery in the interior of the tower of that church—the ecclesiastical parish of St. Mary's having been united with that of St. Ann's in 1890.

LORD BALFOUR of Burleigh, Secretary for Scotland, visited on Monday the county buildings, Ayr, and had an interview with the parties interested in the buildings in reference to the proposals under consideration for the appropriation of a portion of the buildings for County Council purposes and of a portion for the judicial business of the county. A plan for the alteration of the buildings, prepared by Mr. Allan Stevenson, Ayr, on behalf of the County Council, and an alternative plan prepared

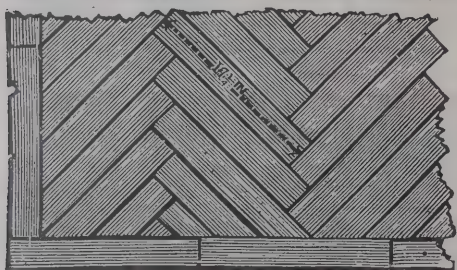
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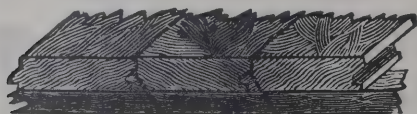
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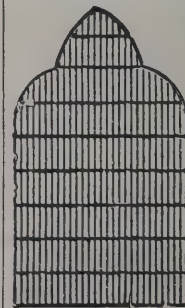
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by the Board of Works were before his lordship. There were present Mr. R. A. Oswald of Auchencruive, convener of the county; Mr. Marcus Bain, vice-convenor; Mr. W. H. Dunlop of Doonside, convener of the Council's law committee; Sir William Arrol of Seafeld, M.P. for South Ayrshire; Sheriff-Substitute Shairp, Ayr; Mr. John Lockhart, solicitor, Ayr, as representing the Ayr Faculty of Solicitors; Mr. Andrew Crawford, Sheriff-Clerk-Depute, Ayr; and Mr. James E. Shaw, county clerk. There is a difference between the parties as to the accommodation to be allotted in the buildings to county and judicial business respectively. Lord Balfour did not express any opinion, and in view of questions raised as to the legal position parties were requested to submit written statements.

### UNDERGROUND BAKEHOUSES.

MANY of the bakers of Liverpool are at present in a state of consternation. Under a clause of the Factory and Workshop Act, which came into operation last January, no bakehouse which is more than 3 feet below the surface of the footway of the adjoining street or ground can continue after January 1, 1904, to be used for the purposes of a bakehouse, unless it shall be certified by the health committee to be suitable for such purposes. In the last report of the medical officer of health for Liverpool (Dr. E. W. Hope) it was shown that on December 31, 1900, there were 1,040 bakehouses on the register which is now kept by the Health Department of Liverpool.

In a note on the provision of the new clause of the Act which Dr. Hope has addressed to the health committee, it is stated that a very large proportion of the bakehouses in the city will be affected by the Act, "practically the whole of those in the older parts of the city, and probably upwards of 25 per cent of those in the suburbs." Many of these bakehouses, it is further said in the note, "are in an insanitary condition, and should be closed altogether. A considerable number, however, perhaps admit of such structural alterations as would enable the required certificate to be given." Dr. Hope's note was accompanied by a list of "suggested requirements for underground bakehouses," the first of the suggestions being "the

bakehouse to be in every part thereof at least 8 feet 6 inches high, measured from the floor to the ceiling, and to have at least 3 feet of its height above the surface of the adjoining street, or of the ground adjoining or nearest to the bakehouse, unless provided with a suitable area or areas into which a window or windows of such underground bakehouses open."

As many of the bakehouses are wholly below the level of streets, it is impossible, says the *Courier*, for them to be brought strictly into accord with the requirements of the Act and of the medical officer's suggestion as given. Copies of Dr. Hope's note to the health committee, with his own suggestions, were forwarded to officials of the Liverpool Flour and Bread Trade Association a few days ago, that an opinion might be expressed upon them. The matter has been considered at two meetings of the committee of the Association, and at a meeting of bakers at the south end of the city, and it has been decided that a deputation representing the trade shall wait upon Dr. Hope and lay before him the views of the trade upon his own suggestions. If a strict adherence to his suggestion be insisted on, the position of many bakers will be extremely embarrassing. In very few cases is there space available to construct new bakehouses on the ground level, and it is not at present seen how bakers will overcome the difficulty of finding fresh bakehouses.

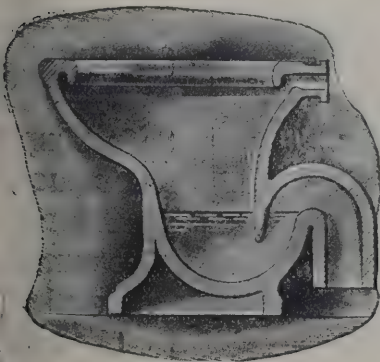
On the bakers' part it is contended that many of the underground bakehouses are as sanitary and well kept as bakehouses on the ground level; that they are more comfortable than ground-floor bakehouses as being "cool in summer and warm in winter," and that in other respects they are more convenient for working than ground-floor bakehouses. It is also contended that, in view of the facts of the bakehouses forming an old existing institution, and of there being no room in the vicinity of most existing bakehouses to build bakehouses on the ground level, every consideration should be shown to bakers by the authorities. It is pointed out that when, some years ago, many of the shippens in connection with dairies in Liverpool were condemned, the late Councillor John Houlding made an inspection of many of them, and suggested that ventilation and improvements should be tried instead of their being summarily closed. This course was adopted, and most of the shippens which had been scheduled as condemned were allowed to remain. Bakers contend that the same policy of ventilation and improvement should be adopted in reference to their bakehouses. At present, however, a state of general unrest and apprehension prevails

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among the many bakers of Liverpool who have underground bakehouses, and the coming interview of the deputation from the local trade association with the medical officer is being awaited with much concern.

### THE AUCTIONEERS' INSTITUTE.

THE second meeting of the session was held on Wednesday evening, when Mr. D. Michael Faraday read a paper upon the rating of machinery, the president, Mr. John Hepper, in the chair. The subject is engaging the attention of surveyors to a great degree, since a Bill is now before Parliament on the question of exemption of machinery from taxation. The matter is surrounded by such complexity of views that it was thought a discussion upon the question of "How machinery is to be taken into consideration if it enhances the value of hereditaments in which it is *in situ*," might solve many knotty points. The assessment authorities urge that this can only be ascertained by finding the actual value of the machinery. The speaker thought that half the difficulty herein would be overcome if the valuer remembered that the whole of the assessment law is based on a hypothetical assumption. What would a tenant give as rent for a hereditament for the purpose for which it is now used? Reference was made to the judgment delivered in the Tyne boiler case by Lord Esher, who laid down the following rule:—"I believe the rule really to be that things which are on the premises to be rated and which are there for the purpose of making and which make the premises fit as premises for the particular purpose for which they are used, are to be taken into account in ascertaining the rateable value of such premises, that when things are brought into this category they would pass by a demise of the premises as such as between landlord and tenant." The company were asked to decide:—"Is the machinery which one finds on any particular hereditament intended to remain permanently there, and is it for the purpose of making the premises fit as premises for the particular purpose for which they are used?" The speaker argued that all machinery in any factory makes that factory what it is, and therefore the only conclusion that one can come to is that all machinery must be taken into consideration where such machinery is

found in use in a factory, and it has to be treated for rating purposes as passing by a demise from the landlord to the tenant. He illustrated how impossible it would be to say how much buildings were enhanced by the presence of machinery if a valuation of the machinery were not made.

Mr. Marshall, K.C., Mr. Herbert Fuller, Mr. James Boyton and others contributed to the discussion.

A cordial vote of thanks was passed to Mr. Faraday for his paper, as well as to Mr. Hepper for presiding.

### NEW STREET STATION, BIRMINGHAM.

IF there is anything more than another which impresses the visitor immediately on his arrival at New Street railway station, says the *Birmingham Daily Post*, it is the colossal and imposing character of the building itself. He cannot fail to be struck, too, by the many arrangements necessary for the proper management of the station—arrangements which work like clockwork, notwithstanding the bustle and animation usually seen there. His attention will be arrested also by the uniform cleanliness of New Street, having regard, of course, to the enormous amount of traffic which is constantly taking place within its walls. Each day the passengers there number well over 50,000, while thrice that number pass over the handsome bridge which cuts through the station, for it has become one of the most populous highways of the city. Yet how many of these have any idea of the vast amount of work that is necessary to keep the huge station in anything like a clean and respectable condition. Quite a series of staffs of men are constantly engaged, in one capacity or other, solely in this work of cleaning and renovating. The necessity of it will be readily understood when one makes even a superficial estimate of the dimensions of the structure and important operations within. Few persons, indeed, even of those who belong to Birmingham, have any true idea of the magnitude of the station. Its area alone is something like 14 acres, and its platforms, if they could be placed in a line, would stretch well-nigh to Moseley. It is calculated that on an average a train either arrives or departs every two minutes. In other words, 700 trains are received into the station in the ordinary working day, and it is computed on the lowest possible basis that their living freights in one year would total the enormous figure of 15½ millions. It

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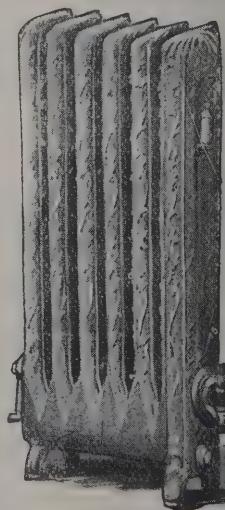
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should be clearly pointed out, however, that these figures only represent a normal condition of things, and that on Bank holidays and other special occasions the amount of traffic is very materially increased. Indeed, there are days when the trains running in and out of the station will number quite four figures.

Time was when New Street railway station occupied the unique distinction of possessing the largest iron and glass one-span roof in the world. It has always been an object of admiration, and although it has during comparatively recent years been surpassed in point of size by the span at St. Pancras, it will ever remain a worthy example of what may be accomplished in the way of roof building. This span, which covers what is known as the old portion of the station, Nos. 1, 2 and 3 platforms, in the entire use of the North-Western Company, has a width of 212 feet, and the highest point from the permanent way is 83 feet. It stretches the entire distance of the station, 360 yards or thereabouts, from north to south, with the exception of course of the lower or Paxton roof at the north end, which continues to the end of the platform to a point near Navigation Street. The span of St. Pancras station, it may be mentioned, is 31 feet wider than that of New Street, and the roof of Lime Street, Liverpool, is also broader, being something near 410 feet, but this is, however, achieved in a couple of spans. The Birmingham roof is supported by a couple of spans. It has been stated that the covered space at Liverpool Street, London, forms the largest enclosed railway station in England, but the roof is not, however, in one span. The Birmingham roof is supported by thirty-six massive iron principals, with innumerable tie bars, which cross and recross in bewildering fashion. The principals on the Stephenson Street side of the station are supported on brick pillars, which form part of the wall of the station buildings and the Queen's Hotel. On the south street side the roof is supported by cast-iron collars, and on the top of these the principals rest on an arrangement of rollers to allow for contraction and expansion due to variations of temperature.

The cleanliness of the roof is, of course, a most important matter. Upon it the light and brightness of the station largely depend, and this brings one to the subject of the work of cleaning and renovation. In this task a gang of workmen are always engaged, for it is of far greater magnitude than would at first sight appear. There are altogether thirty-five bays in the roof, each of which has a width of twenty-four feet, and, assuming that painting was continually carried on by a staff,

say, of twenty men, it would occupy about eight months to accomplish the work, or, roughly speaking, a week for every bay. Having regard to the volumes of smoke constantly emitted from the engines, one would naturally imagine that the glass would be considerably darkened inside. But, as a matter of fact, the result is just the opposite. The sooty deposit accumulating on the outside is very considerable, and it is a common sight to see a strong contingent of men, with ladders, busily working with hard, broomlike brushes. It is quite out of the question to attempt to remove this deposit with water, but by the use of a special chemical preparation the work is easily accomplished, and the huge glass panes are restored to something like their pristine brightness and purity. The cleaning of the inside of the glass is, comparatively speaking, a trifling matter.

For interior renovation, however, the most careful arrangements have to be made for the safety of passengers and workmen, and experts only are employed in the construction of the scaffolding. A platform necessary to do the work required on a single bay will demand, for instance, the use of over 14 tons of scaffolding, and then below this are hung, as an additional precaution, twenty-six huge sheets of black sailcloth canvas. These protection sheets not only serve to the workmen the same function as the netting which is placed beneath the flying trapeze of the circus, but they prevent any tools which may fall from the scaffolding dropping on the platform or permanent way. Altogether there are eight acres of roof, and of this over six are of glass. The "extension roof," or, to make it better understood, that part which covers the Midland platform, is in six spans, the two largest of which have a width of 68 feet, and it is carried by no fewer than 269 wrought-iron principals and girders.

But this roofwork, vast as it undoubtedly is, forms but a part of the duties which receive the cognisance of the painter and renovator. Buildings there are by the score to be maintained—offices, waiting and refreshment rooms and workshops, as well as some eleven bridges, four at the north end, which carry Navigation and Hill Streets, and seven at the south or Worcester Street side. As all these bridges are of iron, it is scarcely necessary to point out the important part which paint must play if the structures are to be kept in good order and free from corrosion. The painting area is nearly three times the acreage of the station. It extends over something like 38½ acres, and to get access to this work 25 tons of scaffolding are always kept at the station. By competent authorities it is

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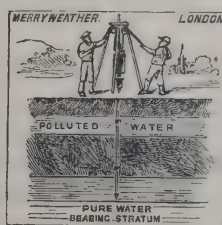
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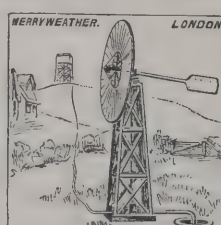
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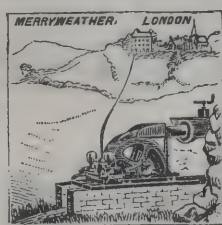
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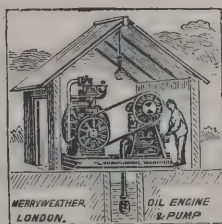


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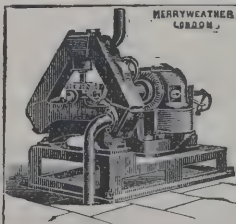


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calculated that if a gang of twenty men started work at the commencement of one year, and worked continuously, it would take them three years to cover the whole surface, and then the area which first received attention would again require treatment. In fact, to give New Street station anything like a respectable appearance the application is necessary of no fewer than 122,000 lbs. of paint, or, to put it in a more simple way, sufficient paint would be needed to fill a small swimming bath. The huge army of station porters are responsible for the cleanliness of the foot-bridge and platforms, and in the early hours, when this work is usually done, they may be seen working with a rest with sweeping brushes of abnormal size. But, with all this co-operation, it is obviously a task of some duration to properly clean a mile and a half of platforms, for such is the distance if their length is totalled up. There is yet another staff of cleaners, but their work is wholly concentrated on the carriage department. By the travelling public, however, their services are perhaps more appreciated than those employed in the capacities already mentioned, for their work comes directly under notice. Yet each, of course, discharges a most necessary work, which, on sanitary grounds alone, is viewed with the utmost satisfaction not only by the travelling public, but by the citizens generally.

### INSTITUTION OF ELECTRICAL ENGINEERS.

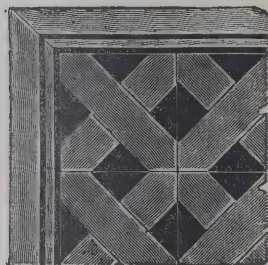
THE opening meeting of the new session of this Institution was held on the 13th inst. in the rooms of the Institution of Civil Engineers, Great George Street, Westminster, when there was a full attendance of members. In the absence of the president, Mr. J. Swinburne, owing to illness, the chair was taken by Mr. Gavey, engineer to the Post Office, who mentioned that after considerable deliberation the Council had determined to postpone the reading of the President's inaugural address until such a time as Mr. Swinburne might be able to attend. Formal business was then transacted, and it was announced that Professor Ayrton had, from ill-health and pressure of other business, resigned the honorary treasurership of the Institution, and that Mr. Robert Hammond had consented to fill his place. The Chairman said that the Council had had under consideration the continuance of the useful and pleasant visits of the members of the Institution to foreign countries, and had arranged the preliminaries for a visit to Italy in the spring of next year. He also mentioned that the Institution had received

a cordial invitation from the American Institute of Electrical Engineers to visit the United States and hold a joint meeting there or in Canada. The communication suggested that such a meeting might be arranged for Montreal next year, or at some spot in the eastern part of the United States in 1904, to include a subsequent visit to the St. Louis Exhibition, where an electrical congress would be held. The Council had considered this invitation, and had decided that as they could not arrange a meeting for next year, owing to the projected visit to Italy, they would accept the invitation for 1904, suggesting at the same time that the joint meeting might be held in Canada, when they would hope to receive the co-operation of the McGill University. The Council had also been in correspondence with the Home Office with regard to the Factory Act, and it had been assured that full opportunity would be afforded for the discussion of the new regulations before they were adopted. The Council had publicly expressed the hope that the Secretary of State might see his way to do what he could for the profession in regard to the employment of young persons in electricity works. The President of the Institute had been elected *ex officio* to serve on the committee appointed by the Home Office to inquire into questions relating to the use of electricity in mines. A suggestion for the levelling-up of the subscriptions to the ordinary maximum would shortly be laid before the members. Before the proceedings closed the chairman presented the premiums awarded for papers read and published during the session of 1901-2.

### BARNSELY MEMORIAL CHURCH.

ON Friday last the Bishop of Wakefield (Dr. Eden) consecrated the church of St. Edward the Confessor, which has been erected at Kingstone Place, Barnsley, by Mr. E. G. Lancaster, of Keresforth Hall, in memory of his father, the late Mr. Edward Lancaster. Mr. Lancaster has also built a vicarage and endowed the living.

The church forms a prominent landmark in the highest portion of the town. It is built in quiet Early English style. The nave is 70 feet long and the total breadth 46 feet, and the chancel is 40 feet long by 20 feet wide. Granite columns separate the aisles from the nave. The floor is in mosaic, the seating of pitch pine, and the choir seats, capable of accommodating thirty-five choristers, of oak. The total accommodation



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is for 400 worshippers. The pulpit is a fine structure of beautifully veined polished alabaster. The upper part is octagonal in shape, each face having tracery panels with carved emblems of the four Evangelists. It is supported on serpentine marble columns with carved capitals, and the steps are of white marble. The font is similar in design and structure, each of the eight faces having moulded panels and richly-carved emblems.

The reredos, which is of an ornate character, is designed in harmony with the church, and is composed of richly variegated polished English alabaster and marbles from Connemara and Castellino used in the sculpturework, enriched by columns of green marble flanking the canopies and backgrounds of gold mosaic. A carved cornice terminates in a pure white marble cross with carved floriated terminations.

At the west end of the church is a screen of pitch pine. The lectern is of brass, representing the eagle with open wings on massive pedestal.

The vicarage, the work of Mr. J. S. Packer, Southport, situated close by, is in keeping with the design of the church. All the elevations are faced with Yorkshire stone, and the roof is covered with green Westmoreland slates and red ridge tiles.

The fabric was erected to designs by Mr. J. S. Packer, Southport, under whose supervision it has been erected.

#### EDINBURGH STUDENTS' ENGINEERING SOCIETY.

PRINCIPAL LAURIE, of the Heriot-Watt College, lectured to the members of the Edinburgh Students' Engineering Society. The meeting, which was held on the 13th inst. in the Heriot-Watt College buildings, was largely attended, and Mr. Horne occupied the chair. Principal Laurie gave an account of his recent visit to the engineering and technical schools of America and Canada. In particular, he described the engineering departments of the Columbia University at New York, the Harvard University at Boston, the Armour Institution at Chicago, the Cornell University and the McGill College in Canada. He noted the extensive scale on which engineering is taught in these institutions, and the thorough and complete character of their equipment. The explanation of the sumptuous character of technical education in the States was to be found in the enormous liberality of America's rich men. The demand for trained and scientific engineers in America was

greater than the supply, and young men, after they had taken their degree, often had the choice of two or three appointments. The course of engineering training extended over four years, during which period practical work in the workshop was taken very seriously. In some of the larger engineering works, when a young engineer was engaged, although he had his degree, he was asked to put in two years in the workshop. While the owners of large works did not accept any but trained and scientific engineers for employment, they also had numerous apprentices, but the latter were only intended to be used as mechanics and foremen. In connection with American engineering schools, the following points, among others, were to be noted:—A high mathematical standard was insisted on at entrance to the university, the authorities did not attach great importance to examinations, and everything was done to encourage students to make original research. Principal Laurie was cordially thanked for his lecture.

#### MINORS AND BUILDING SOCIETIES.

THE appeal of the Nottingham Permanent Benefit Building Society *v.* Mrs. Thurstan has been decided in the House of Lords. The respondent was a member of the Society, and while a minor got advances on land and buildings at West Bridgford. In 1898 the respondent executed a mortgage with the appellants to secure the repayment of 1,200*l.* by monthly instalments of 10*l.* 4*s.* The respondent said that until she was sued for the 500*l.* by her stepmother she was not aware of her disabilities as an infant. After the appellants discovered she was an infant they expended certain moneys in completing the houses without, she said, any request or authority from her. An offer was made by her solicitors to the Building Society to come to a settlement on a fair and reasonable basis, but this was refused. She then raised an action against the appellants asking for a declaration that the mortgage was void, and that she was entitled to have it cancelled. Mr. Justice Joyce dismissed the action. On appeal (the respondent not disputing the claim of the appellants to a lien for so much as was paid by them to the vendors for purchase money and expenses) the Court declared that the mortgage deed was void as against the respondent, and directed the appellants to deliver it up to be cancelled. The respondent had since paid off the amount due to the appellants. The appellants

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contended that the Building Societies Act, 1874, had given minors a general power to borrow and to execute securities, and to enter into obligations for the repayment of money borrowed. Mr. Justice Joyce considered that it was unnecessary to decide the point that an infant could enter into a mortgage to a building society and be bound by the provisions of the mortgage deed, and all the Lords Justices were of opinion that an infant member of a building society could not execute a valid mortgage to secure repayment of advances by the society.

Mr. Hughes, who argued the case for the appellants, contended that upon a true construction of the Building Societies Act and the rules of the appellant society the respondent was competent, notwithstanding infancy, to give a valid mortgage. The respondent could not affirm the purchase and repudiate the advance. They formed one transaction.

At the conclusion of the appellants' argument, and without calling upon counsel for the respondent, the Lord Chancellor moved that the appeal be dismissed with costs. Their lordships concurred and judgment was given accordingly.

### BIRMINGHAM MASTER BUILDERS' ASSOCIATION.

THE annual meeting of this Association was held at the Grand Hotel on November 13, under the chairmanship of Mr. Albert S. Smith. The annual report remarked upon the depressed condition of the building trade during the past year, and stated that the new rules as to operatives had been amicably arranged and appeared to be working satisfactorily. On several occasions during the year deputations from the Association had waited on members of the Corporation and obtained modifications and alterations in the Corporation by-laws and the Omnibus Bill, which were considered essential in the interests of the trade. The balance-sheet showed a sum of £1714. 12s. 4d. to the credit of the Association.

In moving the adoption of the report and balance-sheet, the President said it was a matter for regret that the falling-off in trade had continued during the past year, while it was a matter for greater regret that prices ruling to-day were in comparison worse than the state of the trade; it was many years since competition was so keen as it was to-day. Otherwise the report was of a most satisfactory character.

A dinner followed the meeting, and was largely attended.

Mr. A. S. Smith occupied the chair, supported by the Lord Mayor (Councillor Hallowell Rogers) and Alderman Bowen. Others present were Messrs. W. Sapcote, A. Rowse, G. Kenwick, R. Bulley, C. H. Barnsley, Alderman Bigwood, Councillor Whittall (who was in the vice-chair), T. Cooper, J. J. Moffat, J. B. Whitehouse, A. Harrison, J. Patchett, A. E. Tallis and others.

Alderman Bowen submitted in fitting terms the toast, "The City and Trade of Birmingham." There was, he said, promise in the younger ranks of the City Council which held forth hopes that in the not distant future the city would become entitled to its old title, "the best-governed city."

The Lord Mayor, in responding to the toast, stated that it frequently happened that that banquet was the first public function of the new chief magistrate. It was right that he should attend, humorously added his lordship, in order that he might build a good and solid foundation for his year's work. He approved of the objects of such associations as theirs, pointing out that if the workmen went into union it was right that the masters should do the same, so that there might not be advantage on one side or the other. He had no doubt that, as representative bodies, they were better able to discuss and deal with matters than they would be if there were no organisations. Touching on municipal matters, particularly in relation to the building trade, his lordship stated that what had often struck him had been the great difference in the price of tenders on comparatively small undertakings. There was sometimes a difference of thousands of pounds. He supposed it was one of those freaks of nature which could not be accounted for. The builders as a body were kept closely in touch with several of the departments of the Corporation, and it was a matter for congratulation that the relations between the two had always been of a cordial and friendly character. He hoped that those friendly feelings would be maintained. Alluding to the Corporation Bill, which had just received the approval of the ratepayers, he paid a compliment to Councillor Whittall for the valuable help he had given in framing the building clauses. Councillor Hallowell Rogers, having referred to several other matters engaging the attention of the Corporation, then made feeling reference to the deaths of two of her prominent and most useful citizens—Alderman Hart and Mr. Sam. Timmins. Alderman Hart, he said, died in harness, as a Christian citizen should. Mr. Samuel Timmins was one of a small band of earnest workers of which George Dawson, Charles Vince, John Henry Chamberlain and John Thackray Bunce formed a group, and

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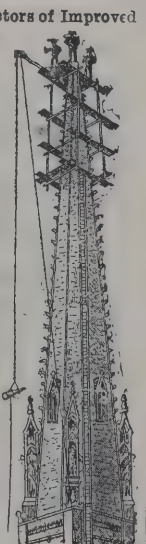
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who endeavoured to raise the social and political life of the city at a time when it was a very low ebb. They laid the foundations on which Mr. Joseph Chamberlain built the new municipal city life of which we were to-day reaping the benefit. Mr. Timmins rendered invaluable work on the free libraries committee. If he had died a quarter of a century ago his death would have been regarded as a great public calamity, for he was then one of Birmingham's most prominent citizens.

The toast "Success to the Birmingham Builders' Association" was proposed by Mr. A. Harrison (president of the Birmingham Architectural Association).

Mr. John J. Moffat gave the toast of "The Architects and Surveyors," and Mr. T. Cooper and Mr. A. Rowse responded.

The toast of the "National Federation of Building Trade Employers" was given by Mr. C. H. Barnsley, and Mr. Sapcote (the president of that body) replied, pointing to the work which it had accomplished.

The concluding toast was that of "The Visitors."

### THE INSTITUTION OF CIVIL ENGINEERS.

At the ordinary meeting on Tuesday, November 11, Mr. John Clarke Hawkshaw, M.A., president, in the chair, the paper read was "Electric Tramways," by C. Hopkinson, M.Inst.C.E., B. Hopkinson and E. Talbot, M.Inst.C.E.

The authors stated that when, about the year 1897, electric tramways had begun to be constructed in Great Britain on a large scale, there had already been many thousand miles in operation in America, and a vast amount of American experience had been available in connection with this branch of engineering. Consequently British tramways had been constructed largely according to American methods, and showed a good deal of the uniformity characteristic of American practice. The authors' experience had been gained principally in the construction of the tramway systems of Leeds and Newcastle-on-Tyne, and the paper discussed a number of important points in tramway practice, which were illustrated by reference to these two systems of tramways. The paper was divided into four sections, viz:—

1. Generation of power. 2. Transmission of power to the cars. 3. Rolling stock. 4. Earth returns.

The nature of the load on a tramway generating station was discussed, and it was shown from actual records to what extent

increasing the number of cars resulted in making the load more uniform. With seventy cars or more, the load was so nearly constant that the steam consumption per unit was substantially the same as though it were constant and equal to the mean. Hence in a station of this size equalisation of the load by means of a storage battery was of no use as regarded economy, though in a small station it might be of great value. A storage battery equal to replacing one-third of the generating plant for half an hour should, however, be installed in a continuous-current power station for the purpose of replacing a generating unit in case of breakdown, and for running cars at night. The effect of short circuits on the generator was considered; in the worst case there might be a force equal to three or more times the normal force applied at the periphery of the armature for a period of one-tenth of a second, that being the time which a circuit-breaker took to open. This necessitated a very strong connection between armature and flywheel. Another effect of the opening of the circuit-breaker was the sudden diminution of the load on the engine to nothing, which necessitated special arrangements for preventing the engine from running away. This required either very quick governing or a heavy flywheel. Except for short circuits, an ordinary governor and an ordinary flywheel were sufficient. Tachograph records showing the rise of speed on one of the Newcastle engines when the load was thrown off were discussed. The question of over-compounding dynamos was considered, and dynamos wound for constant potential were recommended.

The simplest method of transmitting the power to the cars was to make the trolley-wire into an electrically continuous network, and to feed the current into it at various points. In practice, however, it was found necessary to divide the trolley-line into sections insulated from each other, each section being fed at one point. The points of division in the centre of a city were determined by considerations of safety; in the outer districts questions of economy and the necessity of keeping the variations of line-potential within limits might come in. The principles were illustrated by reference to Newcastle-on-Tyne. There was no objection to the line-potential occasionally dropping 100 volts below normal, and this led to the result that a 2½-minute service of cars could be worked up to a distance of two miles from a feeding-point. The most economical size of cable was next considered; the mean current density should rarely exceed 300 amperes to the square inch. This entailed a mean drop of potential of about 13 volts per mile of feeder, and feeders could

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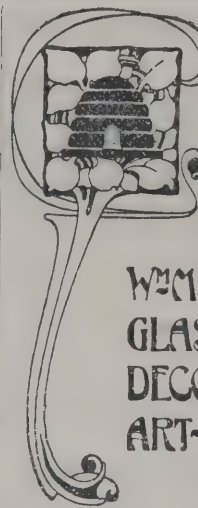
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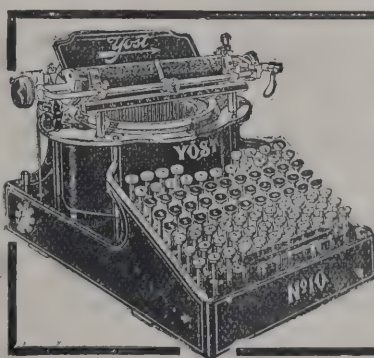
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be carried to a distance of 1 mile or  $1\frac{1}{2}$  mile without boosting. The loss in the trolley-wire in supplying ten cars on 1 mile of double track from one end was between 2 per cent. and 4 per cent. of the power given to the cars. The conclusion was that on the outer sections the line might be divided into sections 2 miles long. In many cases excessive traffic on a particular route had to be dealt with on a few days of the year, the traffic being small on other days. This was illustrated by reference to a case in Leeds where fifty cars had to be supplied with current on twenty days in the year at an average distance of  $3\frac{1}{2}$  miles from the generating station. The method by which this was done with continuous current and boosters was discussed, and was compared with and found preferable to three-phase high-tension transmission and conversion. The Leeds tramway system was as extensive a system as could be economically served by a single continuous-current generating station placed in the centre of the system.

The most important requirements in a motor car for use in city tramway systems were that it should be capable of rapid and well-sustained acceleration, and that it should be able to go quickly up hill. These requirements could be fulfilled only by motors capable of travelling on the level of speeds far above what was allowable in practice. Curves were given showing the acceleration of the car from rest with various motors and under various conditions. A mean acceleration of 3 feet per second up to a speed of 10 feet per second could be obtained with motors of a type found to be satisfactory in Leeds and Newcastle. The effect of bad driving on starting was considered.

There was much difference of opinion on the subject of earth returns. In Great Britain the Board of Trade restriction of the rail-drop to 7 volts had made cases of electrolysis by return currents very rare, but it could not yet be said that absolute safety was secured for metallic pipes in the neighbourhood of tramway-tracks. The resistance of the rails and bonds used in tramway practice as determined in experiments by the authors was given. In a new fished and bonded joint a good deal of current went through the fish-plates and sole-plates. The Falk cast-welded joint was described and also the thermit-welded joint. It was unadvisable to use such joints on sharp curves or on crossing a bridge with steep approaches on account of the effect of expansion and contraction. On straight track, however, the lateral support to the rails prevented variations of temperature from doing damage. Experiments were described from which it appeared that from one-sixth to one-fourth of the

current in the rails was diverted into the earth. A service of about ten cars per double mile could be worked over a distance of two miles, the feeding-point being at one end, without the 7-volt limit being exceeded. The system of return feeders in Newcastle and Leeds was described. Where the Board of Trade limit was exceeded, if all the current were taken out of the rails close to the power station, the extension of the return feeder to points about half a mile distant from the power station would produce a very marked reduction in the rail-drop, owing to the fact that the great concentration of current which took place in the centre of the city with converging routes was thereby avoided. This was the system now adopted in Newcastle-on-Tyne, but provision had been made on the switchboard whereby the cars could be divided into two groups, each group being run by its own generator. The first comprised all the cars outside a radius of three miles, and a second all within that radius. In Leeds the greater part of the current would be taken out of the rails close to the power station, but a portion sufficient to bring the drop of potential in the rails within the legal limit would be sucked back through a number of return feeders about one mile long. Exceptional traffics at particular points were dealt with by special boosters and return feeders. The authors' experiments showed that a current of 300 amperes in the rails between two points, two miles apart, implied a potential of about 5 volts between those two points. The potential was proportional to the current within 1 per cent., which showed that the conduction of the leakage current through the earth was metallic in its nature and not electrolytic to any considerable extent. Examination of the current in the rails and of the potential at various points of the tramway system with a constant current of 300 amperes passing had shown that only a very small portion of the current got into the gas-pipes. This result was discussed and was shown to be not surprising. The possibility of electrolysis with such currents as did get into the pipes was considered. Unless there were strata of such small extent and high conductivity compared with the average and so placed as to cause a concentration of the current into the pipe to a density of a thousand times the mean current density or more, no corrosion of the pipe would take place and the 7-volt limit might be exceeded many times without damage to the pipe. On the other hand, if such strata were present, electrolysis (with damage to the pipe) was quite possible, even though the 7-volt limit was not exceeded.

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# The Architect.

## THE WEEK.

THE Glasgow Corporation are evidently in competition with the London County Council as to which body will display the most colossal discrepancies between estimates and outlay, and it is by no means certain that with the metropolitan body will rest the victory. In 1896 borrowing power was obtained to raise 600,000*l.* for carrying out a sewage scheme. The works were estimated to cost 450,000*l.*, and purchase of lands, wayleaves and other expenditure were put down at 150,000*l.* The amount already expended amounts to 526,000*l.* People who believe in northern methods will jump to the conclusion that the works have been completed for that sum, or say 70,000*l.* below the estimate. Unfortunately for the reputation of Glasgow, the works cannot be considered as more than half executed, for a further outlay of no less than 563,000*l.* will be required. It will therefore be necessary to have recourse to borrowing a second sum of 600,000*l.*, and as affairs are conducted it is impossible to say whether that sum will be adequate for the realisation of the scheme. The latest proposal is to borrow a million. Of course various causes are forthcoming to explain the discrepancy. One is that owing to the inordinate claims made by contractors on other works it was necessary, "in preparing the specification for the sewers and works, to insert such precautionary clauses as would prevent this practice being successfully attempted in the large undertaking which the Corporation had in hand, and to devise, in a form more drastic than usual, provisions to insure the best quality of workmanship and materials. These precautions, which were urgently needed, resulted in the preparation of a specification with terms whose rigidity became the subject of complaint on the part of the contractors. The vigilance of supervision necessary to insure the proper execution of the work gave further cause for discontent, although the experience of engineers in Glasgow, Edinburgh, Manchester and elsewhere abundantly proved the necessity of employing every possible means of scrutiny and superintendence." If contractors have to execute works which were not originally specified, it is only equitable that they should be paid for them as extras, or under another name if preferred. The plain meaning of the precautions was that no extras would be recognised, and contractors were not to blame if they endeavoured to secure themselves from losses and over-estimated the probable extras as contingencies.

ALTHOUGH not publicly announced, there is little doubt about the desire of the Local Government Board to have modified by-laws adopted by the Dartford Rural District Council which would allow of the erection of caretakers and labourers' dwellings of an economical class. It is not easy to use compulsory means, but if the Council will seek authority for passing such a cottage as Mr. E. D. TILL has erected, and for which he was fined, a modification of the by-laws will be sanctioned. At present the subject is under consideration. What has to be insured is that in case of fire there will be no structures sufficiently near to become a menace. With agriculture in its present condition it is not to be expected that substantial cottages of a type adapted for towns can be erected in country districts, although the need for shelters is urgent.

ARTISTS as a rule are not like RUBENS in mastership of diplomatic tactics, and it is as well they make no pretensions to that kind of skill. A case has occurred in Glasgow which came very near failure because of disposition to employ language as if it were intended for the concealment of thought. At a late meeting of the Glasgow Corporation report was submitted which recorded that representatives of the Royal Glasgow Institute of the Fine Arts, viz. MESSRS. MICHAEL SIMONS, P. H. DUNN, J. L. MACFARLANE, J. BURNET and JOHN HENDERSON, with Mr. PERCY TATE, the secretary, were heard on the subject of the communication received from the Institute, "expressing their desire to offer to the Corporation practical sympathy in view of their possible action in extending the scope of

their artistic enterprise, when, after a lengthened interchange of views, it was agreed that a small sub-committee of the parks committee and a small sub-committee of the Institute should be appointed to confer and further consider the matter." So mysterious an announcement was too much for Scottish caution, and there was a general inquiry about the meaning of the transaction. All the representatives of the Corporation could offer in explanation was that information on the subject could not be given. One member's solution was that the members of the Institute wished to obtain control of something which they did not possess at present. The Deputy Town Clerk said the members of the deputation could not tell definitely what they wanted. Eventually, it was arranged that the sub-committee, when appointed, will endeavour to ascertain what is sought in so unusual a manner. We suppose the Glasgow Institute of Fine Arts consider there is a probability that the Corporation will expend money on pictures and statues which are not masterpieces, and they wish to act as guardians of the ratepayers. But if that was the intention, why was it not frankly announced?

THE art masters under the Board of Education are in a precarious position, for outside the official limits there is no demand for their services. When they are found remonstrating or unfolding grievances it may be concluded they have reason for their action. The deputation from the Society of Art Masters that waited on Lord LONDONDERRY a few days ago is a sign that the new organisation of the Board of Education is far from being as efficient as the outside world has imagined. The complaints related to the insufficient qualifications of inspectors in art schools, and the absence of art masters and experts from the Advisory Council for Art Purchases. The want of co-ordination of study in elementary schools and institutions giving advanced art instruction was also mentioned. Lord LONDONDERRY could only say that the Board of Education had at its disposal the services of occasional inspectors whose qualifications had been regarded as of the most valuable kind. Their services would be utilised in the future, and steps were being taken to extend the operations of the art inspectors to other schools in addition to schools of art. The importance of co-ordination was admitted, but for the present it was necessarily mainly a matter for local arrangement. His lordship promised that the request for representation on the Teachers' Registration Council and the Council of Advice for Art should be submitted to the consultative committee now considering the regulations governing the matter. Lord LONDONDERRY's reply is more generous than those usually given. The masters have revealed defects which should be remedied. Whether the official spirit will facilitate improvements has yet to be seen.

THE project of another line of railway between London and Bristol revives the battle of the gauges. BRUNEL was nothing if not original, and he could not accept the gauge which had been adopted by the STEPHENSONS, LOCKE and other pioneers. But he always found men to support his most grandiose projects. The broad gauge was very costly, for there had to be more land purchased, the bridges were of larger span, the rails were heavier and the rolling stock more capacious; but, on the other hand, it was more satisfactory to travel on the Great Western than on any of the lines running northwards. One effect was that the Great Western was compelled to be isolated, for there could be no running powers over other lines. It was necessary, therefore, to convert the broad gauge system into correspondence with the narrow gauge. What is now proposed is to seek for powers to construct a line which will serve a similar purpose with the Great-Western Railway. Bristol, Bath and Basingstoke will be points, and running powers will be sought over the South Western through Woking and to the Waterloo terminus. The only novelties will be the new termini in London and Bristol. It is claimed that the proposed line will diminish the distance between London and Bristol, and there will be more direct communication with the South-Western system. If constructed, the proposed line is likely to increase the importance of Bristol.





PAINTERS' ARCHITECTURE: ALBANO.

### MACHINERY AS FIXTURES.

IN the course of the articles relating to the case in which certain tapestries were claimed to be fixtures, although they were not directly attached to walls, we endeavoured to point out the modern tendency of the Courts with regard to fixtures in general. It is not always feasible nor perhaps is it at any time judicious to endeavour to reduce so important a subject to the brevity of a formula, but architects and surveyors cannot be expected to go through a long course of reasoning when they are required to give a decision on a short notice. It is generally sufficient for their purpose to realise the extent to which anything described as a fixture can be considered as attached to the land, which in England appears to be not only the most esteemed class of property, but the very base of the Constitution itself. Electricity is popularly supposed to be an invisible power which, regardless of the injuries it may inflict on the way, is always seeking a refuge in the earth, and fixtures likewise are not to be considered as they appear in the form of wainscoting, conservatories, trees, but as things which as much belong to the earth as does the lightning, which seems to rush from the heavens to it as a home and protection.

By using the ground as a support it is supposed that the law of fixtures gains not only consistency and security, but simplicity also. A house becomes, as it were, a part of the earth, therefore any action which injures walls, roof or foundations, affects the earth, and as such is penal. If tapestries or other decorations are closely united to walls, the removal causes risk; therefore if such things were not intended to remain permanently as part of the building, they should have been set up in such a way as would make their portability (in a legal sense) manifest to all. In other words there should be nothing to suggest direct or indirect legal conductivity between them and the land.

It is comparatively easy to determine what objects correspond with those which were in use when the difference between fixtures and removable possessions was first made the subject of discussion. Doors, windows, outbuildings, massive dressoirs, hearthstones, chimneypieces, &c., have been long in use, and although put in by a tenant, were in old days rarely removed. It is not going too far to assume now they were never intended to be removed. But a great variety of aids and appliances have in course of time become necessary in houses. Some of them are more advantageous when fixed, and on that account a real, or more often a tacit, permission is given by which their removal is allowed, and they become only nominally fixtures. If it were anticipated that objections would be raised it would be possible in the majority of those cases to make arrangements by which even an indirect attachment to the freehold would be avoided. A bookcase or a pier-glass need not be nailed to a wall, and invention could easily devise security for other pieces of furniture or decoration while in position.

There are, however, classes of things employed in buildings, if not always in houses, which were unknown to our ancestors, but which are now indispensable. They may be comprised in one class as means to supplant or supplement human labour, or, in other words, as machines.

Fixity is essential to the majority of them. That quality can sometimes be imparted by the mere weight of material employed in the machine or apparatus. If the machine vibrates a base of cast-iron will sometimes be sufficient to make it steady. But from the time of the introduction of machinery by tenants it was seen that a landlord's interests were not served by the imposition of regulations which would hamper the tenant's trade. Under the name of trade fixtures a great many things were held to be removable which, if the letter of the law were imposed, would have to remain. If we take the list prepared by CHITTY over half a century ago we find among trade fixtures steam and other engines; machinery, "if let into caps or steps of timber;" buildings, if used in connection with an utensil that was removable; cranes, furnaces, pumps, &c. In case removal led to deterioration of the property, it was no doubt optional with the freeholder to adhere to his full rights. As far as can be judged there was, however, a spirit of equity everywhere by which a tenant was not deprived of the assistance which he had set up and which enabled him to live.

In modern days the use of machinery has become more general. It would be no exaggeration to say that in the industrial conflict which England is waging against the greater part of the civilised world, machines are as important as cannon in military struggles. Without the aid of machinery, or with less effective machines than our competitors, it will be impossible to sustain our position as producers. As a consequence, it is now possible to have the temporary use of machines, and the modern "hire and purchase system" has been adopted for them in common with furniture, musical instruments, books, &c. The question arises, How is the law of fixtures affected by arrangements which are intended to increase the productive power of the country? There was no fear of foreign rivals when it was laid down that whatever is attached to the soil directly or indirectly belongs to the soil, and why should a fear arise now, or, if it must exist, why should it not succumb to the ancient privilege by which land is held to be superior to all the products of all the machines which can be collected in any one place? In a few words, that represents the discussion in which the ablest judges and lawyers have been recently engaged. The circumstances are remarkable, and, it may be added, characteristic of Great Britain alone.

A man who held a lease for ninety-nine years of some land at Reading erected a factory on it. He mortgaged the premises with the fixtures. The mortgage was assigned to the defendants, Messrs. WILLIAM ASHBY & SON, LTD. Before the assignment, Messrs. F. W. REYNOLDS & CO., the plaintiffs, let on hire to the lessee woodworking machinery which was to be paid for in instalments, but until all the conditions were fulfilled the machinery was to remain the sole and absolute property of plaintiffs. Everyone knows that machines for planing, moulding, tenoning and such operations are useless if there is the least vibration. Accordingly a bed of concrete was laid down beneath each machine, to which it was bolted. There was nothing extraordinary in the arrangement, for we sup-



pose there is not a woodworking machine in the country which is fixed for work in any other way. Although the effectiveness of the machines was thus insured, the course adopted was sufficient by English law to transform the ownership of the property, to take it from the manufacturer and to vest it in a firm who had not paid for its possession. Such is the power of a few bolts, although they are removable through having a part tapped and nuts screwed on them. The conditions not being complied with, the plaintiffs demanded the return of their property, but the possessor refused. An action was taken, but the case was so simple the judge declined to allow the question of ownership to be left to a jury. The decision in *HOESON v. GORRINGE* was that similar articles were fixtures, and judgment was accordingly entered for the defendants.

The case came a few days ago before the Court of Appeal in the form of an application for a new trial. The Master of the Rolls, Lord Justice ROMER and Lord Justice MATHEW were the judges. Counsel for plaintiffs could not boldly face the facts. He could only argue about the absence of evidence that the machines were part of the freehold, and that the mortgage was entered into prior to their arrival. There was no getting over the circumstance of the beds of concrete, the iron plates with holes and the bolts with nuts. If the machines depended on their own weight English law might concede they were not fixtures, for as Mr. Justice BLACKBURN laid down:—"Perhaps the true rule is that articles not otherwise attached to the land than by their own weight are not to be considered as part of the land, unless the circumstances are such as to show that it was intended all along to continue a chattel, the onus lying on those who contend that it is a chattel." A gas stove, however large, is removable; a gas engine becomes a fixture. It is true Mr. Justice BLACKBURN did not anticipate the hire and purchase system, but if he did his rule would be unaltered. The Master of the Rolls said it was clear law that, as between landlord and tenant or between tenant for life and remainderman, trade or tenants' fixtures, which were attached to the freehold in such a way as to become part of the freehold were included in a mortgage of the land and could not be removed as against the mortgagee. There is consequently an extraordinary risk in disposing of machines without prepayment. A man in difficulties may forget to point out when he is raising money his exact position as respects all the property found on his premises. The apprehension will prevent arrangements for acquiring machines on easy terms, but architects and surveyors who may be engaged in cases connected with machinery will do well to remember that in most cases a machine must henceforth be considered as a fixture.

### THE ENCYCLOPÆDIA BRITANNICA.\*

THE subjects which are treated in the seventh volume of the supplementary series of the "Encyclopædia Britannica" are no less varied and important than those in the preceding volumes. The first article relates to Mosaic, and is from the pen of Sir W. B. RICHMOND, R.A. He begins by remarking that "the art of mosaic has never been deeply implanted in the artistic sensibilities of the North of Europe, nor has it been employed much either in France, or Germany, or England. It ceased to be generally adopted in Italy when fresco, oil and tempera painting came into vogue." Reasons are given for the indifference to mosaic decoration. So long as efforts were restricted to imitations of paintings in oil or fresco there could not be success. According to the writer, "The very first principles which go to make a fine picture are just those which should be avoided in mosaic—elaborate modelling, delicate transitions of light and shade, and picturesque effects of dark and light—materialistic resemblance indeed. The designer for mosaic should ever

bear in mind his material, and in his designs for it he should accentuate those characteristics which belong essentially and specifically to mosaic and to no other technique." Sir W. RICHMOND is opposed to the execution in Italy of mosaics for English buildings. All mosaics should be executed on the wall under the direction of the designer. He maintains that in those by him in St. Paul's the work "was conducted on a right basis, and not on the wrong and futile method previously employed in England." When executed in that way mosaic is likely to be more costly than if produced in a manufactory, and the demand will therefore be restricted.

The article on Mural Decoration, by Mr. WALTER CRANE, also refers to the difficulty of producing mosaic corresponding with the work in Ravenna and Venice. "It is," he says, "perhaps the most difficult method to use with success in a building not originally intended for such decoration, or where carved architectural ornament competes with it, especially where the difficulty exists (which is always present) when it is sought by moderns to decorate a building of another age." As respects fresco, it is remarked that "unless some means can be found of enabling the actual painted wall to resist the natural dampness of the English climate, it does not seem likely that true fresco can ever be really naturalised in Great Britain." Among experiments Mr. CRANE refers to his own work in Redcross Hall, in which ordinary oil-colours with turpentine as a medium were used on fibrous plaster. Recent efforts in tempera painting on the method described by CENNINO CENNINI are commended. Something is said about the varieties of wall-papers. As to stencilling, it is remarked that "house painters and decorators do not use stencils much except for small borderings and corners, where they usually have a mean and cheap effect; but used as a means of covering a wall with a bold field of floral repeating pattern of an abstract kind, they may be quite sufficient and agreeable." The coloured poster is described as the real modern equivalent for mural decoration. While the largeness of the figures and the bold and simple colouring are admired, commercial exigencies are said to have a vulgarising effect on the work, and therefore "a serious school of design cannot be expected to arise out of such conditions."

The article on the allied subject of Ornament, by Mr. L. F. DAY, is rather short. He says the designer should transfigure instead of imitating natural forms. It is pointed out that national characteristics in ornament are becoming rare owing to international traffic. The question of pattern is now important, for it is supposed by amateurs, at least, that a more free arrangement is possible. Mr. DAY holds that the designer's "first business is to build patterns upon lines, if not intrinsically beautiful at least helpful to the scheme of decoration." Professor A. H. CHURCH writes on Pigments, and a surprising amount of chemical knowledge is conveyed in half a dozen columns.

Another subject treated by a master is Portraiture, by Sir GEORGE REID, ex-president of the Royal Scottish Academy. He gives a brief history of the art. Among the artists who are now practising in this country he cites WATTS, ORCHARDSON, SARGENT, OULESS, SHANNON, FILDES and HERKOMER as worthily carrying on the best traditions of the art. A print from Sir G. REID's *Professor Mitchell, D.D.*, is introduced as an illustration.

All lovers of Greek art and literature will find in the paper on Mycenaean Civilisation, by Mr. D. G. HOGARTH, an admirable résumé of the latest conclusions on one of the most important of subjects. When SCHLIEMANN discovered corpses "smothered in jewels" at Mycenæ in 1876 he did not realise the full importance of the site. It has since been ascertained that "Mycenaean civilisation was a phase in the history of all the insular and peninsular territories of the east Mediterranean basin." Traces have been found in a region extending from Malta to Paphos. Not only the isles of Greece but parts of the mainland display evidence of the mysterious influence, but how it arrived at Mycenæ has yet to be determined. Another Greek subject with which Mr. HOGARTH has been associated is Naucratis, from which the British Museum was enriched.

From Mycenæ or Naucratis to a modern city like New York the distance is vast. The architectural transformation of New York through the agency of steel is described,

\* The new volumes of the *Encyclopædia Britannica*, constituting combination with the existing volumes of the ninth edition the tenth edition of that work, and also supplying a new, distinctive and independent library of reference dealing with recent events and developments. The seventh of the new volumes, being volume xxxi, of the complete work. (Published by the *Times*, London.)



but it has to be acknowledged by Mr. ALBERT SHAW that "no great metropolis, however, had done so little as New York to produce those notable effects in architecture that are derived from the symmetrical and balanced placing of buildings of a public character with reference to each other, with suitable approaches and with open spaces about them; and no other great and rich city of any period of the world's history, perhaps, was so lacking in the embellishment of great public fountains, heroic monuments and groups of statuary."

Among the biographies are one of WILLIAM EDEN NESFIELD, by the late J. M. BRYDON, and one of JOHN LOUGHBOROUGH PEARSON, R.A., by Mr. W. D. CARÖE. Of the latter it is said, "Pearson's church plans possess great variety and interest. The management of choir and sanctuary evidences much individuality, and the side chapel is frequently treated so as to give additional scale to the building. In general design he first aimed at form, embracing both proportion and contour; and his work may be recognised by accurate scholarship coupled with harmonious detail. Its keynotes are cautiousness and refinement rather than boldness." NESFIELD served with his uncle, ANTHONY SALVIN, as well as Mr. BURN. In his twenty-fourth year he commenced practice in London. "Three years afterwards began a nominal partnership with NORMAN SHAW, the artistic fruits of which have sometimes been exaggerated; they shared rooms in Argyll Street for some years, but never collaborated in any design." NESFIELD planned Cloverly Hall when he was twenty-nine. There was more of a developed taste in Kimmel Park, and the two are the typical examples of his style. His career was rather short, for he retired from practice some years before his death in 1888.

The references to a few of the articles in the seventh volume are intended to be suggestive of the comprehensiveness of the work. There are many articles which are scientific and practical, such as those on Power Transmission, Photography, Motor Vehicles, the Phonograph, Ore Dressing, Ordnance, &c. Owners or occupiers of houses may derive a lesson from what is said in the article on Negligence, viz.:—"Ordinarily a man is responsible only for his own negligence and for that of his servants and agents acting within the scope of their authority. For the acts or defaults of the servants of an independent contractor he is not liable. But in certain cases a stricter obligation is imposed on him by law. The occupier of premises is under a duty to all persons who go there on business which concerns him to see that the premises are in a reasonably safe condition so far as reasonable care and skill can make them so. Thus he cannot release himself by employing an independent contractor to maintain or repair the premises. The effect of this doctrine is that the occupier may be liable if it can be shown that the independent contractor, or his servant, has been guilty of a want of due care." If in the volume one class of articles seems to engross most attention, it is that comprising such subjects as Pathology, Physiology, &c. A glance at them is enough to suggest how empiric is the ordinary medical practitioner's system of dealing with disease. The prefatory essay treats of "The Influence of Commerce on International Conflict," and is by Mr. FREDERICK GREENWOOD. Fifty years ago it was taken for granted that commerce would overcome war. It is now evident that a new market may become a *casus belli* as easily as an insult to an ambassador. The volumes must have the effect of clearing away many similar illusions, and on that account they are among the most valuable products of the printing press.

**The Land Agents' Committee** of the Surveyors' Institution met on Tuesday, 18th inst., at the offices of the Irish branch, 110 Grafton Street, Dublin, Mr. Alfred H. Wynne, F.S.I., in the chair. The minutes of last meeting having been read and signed, the committee entered upon the consideration of several matters of moment to Irish members of the Institution, which it is intended to bring before the Council in London by deputation. A deputation was also appointed to wait upon the Chief Secretary for Ireland to submit the views of the committee on questions dealing with the forthcoming Land Bill. Amongst other business transacted applications from leading land agents desiring admission by election to the membership in Ireland were dealt with, after which the committee adjourned.

### MORRIS'S RED HOUSE.

"THE Red House," Bexley Heath, which in a few days is to come under the auctioneer's hammer, was described by Dante Gabriel Rossetti as "more a poem than a house." And indeed (writes a *Daily News* representative) it was the cradle of so much that is noble and true in our life of the beginning of the twentieth century that when I bent my steps towards William Morris's old home it was with the feelings with which one enters on the reading of a stately and beautiful romance.

Think of the houses turned out forty years ago, to the order of prosperous aldermen and successful contractors, those "sensible houses, with no nonsense about them," brick boxes with lids of slate; or perhaps affecting to be "artistic" and "genteel," with utterly incongruous stucco ornament. Think, too, of the houses of more pretensions, ugly and slavish copies of the classical buildings of old Greece, or a mean and meaningless muddle of the Gothic, the whole spirit of which had died out amid the hurry and clamour of our factories and market-places.

The spirit that treated use and beauty as things apart, and saw not the usefulness of beauty, that believed the multiplication of machines a greater thing than the enriching of life, seems to us to-day stupid, but at the beginning of Queen Victoria's reign it had well-nigh engulfed the nation.

However, in the world of ideas the note of revolt had already been sounded, and in the romantic pages of Scott and the wonderful visions of Keats and Shelley men's souls had sought relief from the dreary commonplace of a life founded too exclusively on the maxims of Mr. Wordly Wiseman. It was just when the new influence was beginning to spread to the world of art that William Morris and the brilliant circle of which he formed part were in the flush of their youth and the heyday of life's summer. Morris had published in 1858 "The Defence of Guinevere and Other Poems," which, although cast into the shade by the more musical and brilliant work of Tennyson, struck a higher and more splendid note of passion, which marked the young writer as one of the finest spirits of the time. Ford Madox Brown, Swinburne and Burne-Jones were among his intimate friends, and so was Dante Gabriel Rossetti, under whose imperious influence he had abandoned architecture as a profession and taken to painting, in which he never became more than an imitator of his friend.

Morris, too, had just met at Oxford the beautiful Jane Burden, whom he married, and whom Rossetti never tired of painting. It was then that he began to discover his wonderful power in decorative art, and with the aid and stimulus of his circle of choice spirits to wage war on the universal ugliness of the life around them. Not only houses, but furniture and every object of common use had descended under the pressure of the utilitarian spirit to a hideous depth of plainness, and it was theirs to charm back the Spirit of Beauty into our daily life.

And first and above all it was necessary for Morris to have as his workplace, the background of his inner life, a home which should in some sense realise the new spirit. What could be a prettier notion than that this background should be provided in the house to be erected for himself and his newly-wedded bride? All the friends joined with enthusiasm in the idea, they would enshrine Morris and the work of which he was to be the active head in a scene which should be—to steal the title of his later famous poem—an "earthly paradise."

Thus it was that the Red House came to be built. Amid the flowery-lanes of Kent, on the very ground the "Canterbury pilgrims" of old Chaucer had trod, and where John Ball had stirred up the carles and yeomen of the south, a beautiful orchard was bought, and the building of "the house beautiful" began.

The architect was Philip Webb, another of the brilliant group, in whose hands the house became not a mere survival of dead Gothic forms, but an application of its spirit to the needs and circumstances of the time. It was the first example of the revived use of red brick for domestic architecture, and thus became readily known throughout the district as "The Red House." It was the mother of thousands of such houses which now grace our English landscapes from sea to sea, and Mr. Norman Shaw owed much of the inspiration of his fine work in our London streets to this original.

And what a happy time was spent in the early years of Morris's wedded life, when in their charming home they kept open house to a circle of bright spirits, all of whom combined to make each detail of furniture and decoration perfect. Every article, every utensil, had to be designed and manufactured on purpose for the house, to escape the debasing influence of universal machine production—and the making of the home was thus a constant experiment and lesson, which aided the business of artistic manufacture.

It was a royal time. Here the "idle singer of an empty day" took his fill of beauty, tended his grounds in his blue shirt, till, with their wattled rose-trellis, bowling-green shaded by apple trees, quaint beds, green alleys and trim hedges, they



became the very type of a restful old English garden. And month by month the young friends foregathered here and perfected each detail of beauty, till Rossetti himself declared that it had become "more a poem than a house."

Sadly enough, after five years in this house, where his two daughters were born, Morris had to leave, in order to keep a firmer hand on the growing business which he afterwards made such a triumphant success.

It was growing dusk as I approached this sacred spot, the very birthplace of beauty in these realms. With its steep-pitched roofs of dark red tiles, its low, overhanging eaves, low, wide porches and clinging ivy, the house seemed to embody the very spirit of repose. Through the massive oak door I stepped into the entrance hall, and there and in other rooms noticed the red-brick fireplaces with a slight start. The spaces of plain red brickwork seemed for a moment as though one was mistaken, and had accidentally stepped outside, until one realised how much finer and more natural were these fireplaces, with their plain brass and iron and entire absence of added ornament, than the pictorial tiles and cast-iron leaves and flowers with which the builder even to-day insists on decorating our domestic hearth. This throughout was the spirit of the house; grace and strength of form, but an utter absence of trivial decoration. Not that applied ornament was missing; the drawing-room walls contain scenes from Chaucer done in distemper by Burne-Jones, and the armoire in the hall a painting dealing with a subject from the "Niebelungenlied," by Morris himself, showing curiously his efforts at copying the style of Rossetti. Mrs. Morris, too, whose face we all know so well from a score of pictures, stencilled with her own hands the decorations of some of the walls and ceilings, and Morris's own work is to be seen in the stained glass of the windows. The house, with its well sheltered by a conical candle-extinguisher of red tiles, gives an impression of harmony and grace and restfulness such as no combination of architectural "features" could have produced. The beauty is the building's own, not a meaningless line is in it.

#### BERKS ARCHÆOLOGICAL SOCIETY.

THE first meeting of the winter session of the Berks Archæological Society was held at the Abbey Gate, when an interesting lecture was given by Mr. O. A. Shrubsole on "An Ancient British Barrow containing Cinerary Urns at Sunningdale." The Rev. Alan Cheadle presided.

Mr. O. A. Shrubsole, according to the *Reading Mercury*, said the subject of graves and dead men's bones was not an attractive one, but it was a subject which, if pursued reverently and scientifically, was capable of yielding very fruitful results. Remarkable discoveries had been made quite recently in Egypt in this direction. The cinerary urns—specimens of which were recently found at Sunningdale—showed what a lot of trouble the people took with regard to the burying of their dead. They saw at once there was a great deal of civilisation behind it. With regard to the particular urns before them, the body of a person had been cremated, the ashes collected and placed in an urn, which was deposited in a convenient place. Then, too, they found a number of ideas connected with this practice. At a very early period, before that represented by those urns, the bodies of persons were placed in a chamber in a large mound, the chambers representing houses. Here they had a situation pregnant with ideas—that the dead person would appreciate the comforts of a house. There was an instance in this county where a deposit of charcoal was found, it evidently being thought that the dead person would be able to warm himself. It was frequently found that the earlier ancient Britons buried their dead without cremation. They used to lay the corpse in a reclining or sitting position in a huge mound of earth, and put vessels of food and drink near. All investigation pointed to the fact that as far back as they could go in the Neolithic ages social distinctions existed. This was evident from the fact that some of the burials were on a larger and more costly scale than others. The mounds and urns in one case would be large, and in another small. The urns found at Sunningdale were of great variety, and the mounds in which they were found differed in size. They belonged to the Bronze period. These urns were found upside down, and he had no doubt that in certain cases the people thought it undesirable that the spirit of a dead person should escape, and so inverted the urns to prevent this. There were other tumuli in the immediate neighbourhood of Sunningdale which had not been examined, and he would like all landowners, and those who had influence with landowners, to know the great desirability there was to have these "barrows" examined. But for the intelligent care of Mr. W. G. Craig (of the firm of J. D. Craig & Son, contractors, Camberley) they could have known nothing whatever about these tumuli. They saw how difficult it was to strike out anything new in this

world; at the present moment there was an agitation for the substitution of cremation for inhumation. London had just started a crematory, and he (Mr. Shrubsole) wished it every success. No doubt the ancient Britons were much more practical in sanitary science than we were at the present day.

On the proposition of the Rev. P. H. Ditchfield a hearty vote of thanks was accorded to Mr. Shrubsole for his instructive lecture.

Mr. J. D. Craig spoke of the finding of the urns, numbering altogether about twenty-three. The proprietors of the land, however, were hurrying them in getting the ground turfed over, and they did not have quite so many opportunities for research as they wished. These urns remained in a stable for two months, and it was a wonder they had not been unknowingly destroyed.

Mr. Ll. Treacher said there seemed to be two kinds of burial-places. In one case the dead were cremated and their remains placed in urns; in the other, where the bodies were not cremated, the remains were deposited in elongated mounds. He had recently read an article on the subject, and the writer's theory of this was that people in times past who buried their dead in the round "barrows" entertained the doctrine of the immortality of the soul, while those who used the elongated mounds believed in the resurrection of the body. The writer traced the connection between these latter and the graves we now saw in our churchyards.

Mr. Shrubsole pointed out that the idea of the immortality of the soul had been recognised as far back as they could go with regard to man's thought about himself. They never could conceive of themselves or of anything ceasing to be. The theory of their predecessors was that there were two parts in everything—a body and a spirit; the body might end, but the spirit continued. When a person slept, the theory amongst uncultured races was that the spirit for the time left, and returned when the person awoke.

#### VAUXHALL BRIDGE.

AT the meeting of the London Council on Tuesday the bridges committee presented their report with regard to Vauxhall Bridge, recommending—"(a) That the resolution of the Council of February 22, 1898, directing that the new Vauxhall Bridge be a granite bridge backed with concrete be rescinded; (b) that the estimate of 170,000*l.* submitted by the finance committee for the building of the superstructure of the new Vauxhall Bridge be approved, and that an expenditure up to the amount be sanctioned; that the design submitted, showing a steel elliptical arch structure, be adopted, and that the engineer be instructed to prepare the necessary contract, plans and specification."

Lord Monkswell stated that the report of the bridges committee had been before the general purposes committee, who had expressed a desire that further information might be given. He asked that the report might be withdrawn for that purpose.

Mr. Sears declined to take that course.

Lord Monkswell said the reason given by the committee that they could not make the spans of a granite bridge conform with the Act of Parliament was not a sufficient one for asking the Council to reverse its whole policy with regard to the bridge. Parliament might see its way to modify some of the details so as to permit a granite bridge to be erected. It now, however, appeared that that was not the only reason for asking for a reversal of the Council's policy, and he thought they should have the fullest information before the Council before they came to a decision on the present proposals.

Mr. Sears (vice-chairman of the bridges committee) said it was after careful consideration and with some regret that the bridges committee had decided to alter the design. The decision had been arrived at on two grounds. The first was that stated by Lord Monkswell, not so much that the spans of the bridge could not be built in accordance with the Act of Parliament, but that, owing to the increased strength of centering, it would be impossible under the Act to form that centering with the headway throughout the whole width as required by the Act. An even more material reason was that a difficulty had arisen with regard to the foundations already constructed. When the original borings were taken, it was thought by the then engineer that they would have arrived upon the hard blue clay, and would have been able to secure sufficient strength of foundation to carry a heavy granite bridge. But it had been discovered that that was a mistake, and that the clay was of a softer nature than was originally expected. They were not on the blue clay, and when the cofferdams had been constructed it was discovered that the clay was not capable of carrying a heavy weight. It was then too late to make any alteration and to increase the width of the foundations in order to carry a granite bridge. No responsibility for this rested on the present officers, and they



were acting upon the advice given by the present officers. They looked at the matter as practical men. It was no use seeking to go back and regretting what had been done. The opposition to the steel type of bridge came entirely from artists and from those who thought it would not be so artistic as a granite bridge, which they considered would be more harmonious with the surroundings. Even if that was so, it did not follow that a steel bridge was incapable of artistic treatment. The essential point was that, whatever material they used, the design should be suitable for the material. The engineer told him that the plan put up in the hall was only the first sketch. The details of ornamentation and finish were yet to be considered, and the engineer had offered to consult with the architect of the Council with regard to the artistic finish of the bridge. The engineer said he could not take the responsibility of building a granite bridge upon the piers.

Mr. Strauss supported the recommendation, and declared that whatever type of bridge they put up there would always be a certain amount of artistic prejudice against it.

Mr. Ward said they must consider the utilitarian side of the question before the artistic. No one could say that Westminster was an ugly bridge, and the one now proposed was like Westminster in many of its features.

Mr. Beachcroft asked what they had been doing if after five and a half years they found they were mistaken in the composition of the bed of the river. It revealed a state of things which no municipal body should pass over *sub silentio* or without the fullest possible information. He therefore moved that the report be referred back to the committee for further information.

Mr. R. A. Robinson seconded the amendment.

Mr. J. Burns, M.P., declared that outside criticism on this matter was both unfounded and undeserved. He knew that considerable delay had already occurred over the rebuilding of Vauxhall Bridge, but that was partly owing to the requirements of the Thames Conservancy. The bridge was urgently required, and he hoped that there would not be further delay. The Council had listened too much to the voice of so-called culture, and whenever in the past it had departed from its primitive common sense and abandoned its own idea of what was beautiful at the instance of artists, it had always been led into pitfalls.

Mr. Emden supported the recommendation of the committee. He declared that they had before them every information to enable them to come to a conclusion on the subject. If they put up at Vauxhall another such structure as Westminster Bridge they would have nothing to fear from criticism in the future.

Mr. Dickinson asked that the report might be put off for a week or two in order that the public might be convinced that it was impossible to put up a granite bridge at Vauxhall.

After further discussion the amendment was rejected by a large majority.

The recommendations of the committee were then adopted.

The following letter from Professor Beresford Pite has appeared in the *Times*:—The London County Council will shortly have to come to a fresh decision upon the design of this bridge. It is a matter which presents many problems of importance to the public, not only as to its sufficient width and suitable gradient for dignity and use, but as to its construction, whether of stone arches, concrete cantilevers, or steel arches and girders, each of which methods have at one time been considered. There are also artistic problems of an architectural character to which public attention should be directed, as a building of this magnitude forms a sufficient monument of the taste and feeling of the generation which erected it to merit the earnest attention of all who are capable of being influenced by beautiful objects and their characteristics.

In a work of the magnitude and character of this great bridge the grandeur of the simple lines of the constructive arches and piers, and the rising curve of the roadway gradient, have sufficient meaning to give interest to the whole structure. Mere applied ornaments in such a case are needless and wasteful superfluities. They cannot add beauty or meaning, or afford scale or increased dignity to the vast structure to which they would be attached. Monumental statues might be placed upon the piers as affording convenient pedestals adjacent to the roadway, but the bridge as a design would gain nothing from such adornments owing to the great difference of scale involved. It will be a wise economy in the interests of art and of the public purse to reject the cost of any ornamental features on this bridge. The Council have already decided, in deference to the views of the public and of artistic authorities, to erect a granite bridge, though confining this material to its surface, and proposing to construct the bridge of concrete cantilevers upon the design of Sir A. Binnie, its former engineer. The concession of granite instead of iron was a considerable gain in principle, monumental effect, and the possibility of an effective architectural treatment being afforded,

as well as increased permanency and the economy of perpetual repainting.

The gain, however, in principle proved illusory in application, as a granite design was approved by the Council involving the use of an abundance of very bad architectural detail in a most inartistic way with meretricious contrasts in different coloured granites. That the artistic parts of this design fell into incompetent and unknown hands was much to be regretted, as the severe beauty of London Bridge and the simple effectiveness of the newer Putney Bridge would have ever demonstrated. A granite bridge, whether of good or bad architecture, is however now abandoned by the committee in charge, and the Council are to be asked to adopt a steel design by their new engineer. It appears that the committee fear difficulties in the execution of a granite or granite and concrete bridge which another application to Parliament would have to remove. This reason, in view of the large amount of time expended upon preliminaries already, should not be allowed to weigh with so permanent a work, and the powers required ought to be obtained to properly complete the bridge to a good design.

Should, however, the Council decide otherwise, which it is to be hoped they will not do, and Mr. Fitzmaurice's new scheme is to be developed and carried out, attention should at once be called to the artistic character of the new design. Examination of the drawings recently on view at the Council chambers shows that the engineering factors of form and line in construction simply expressed will have a perfectly satisfactory effect, and need only to be externally emphasised by the simplest arrangement of the lines.

It is, however, thought necessary to apply to the engineering design some would-be Gothic architectural forms of great vulgarity and stupid want of meaning, against which all people of intelligence and taste will incessantly protest, if carried out. Let us ask the need to imitate badly in cast-iron, upon an essentially modern steel bridge, the forms of Gothic stone tracery of the Middle Ages, and in a method unworthy of even a churchwarden of the early nineteenth century? The Council could do nothing more certainly to mark ignorance and want of taste in architectural matters than to permit the perpetration of the ornamental parts of this design.

The stonework piers which support the steel arches are also terribly mauled in this same design by the Gothic spirit, and evidence gross ignorance of simple architectural design. On the whole subject it is easy to be angry and yet to feel that wrath may be useless; but an earnest appeal should be made to the London County Council to avoid the pitfalls of would-be artistic design from untrained hands, and to authorise their engineer, for whose skill as a constructor all London will be glad to cherish esteem, to seek competent and responsible architectural advice, so that an engineering success may not become an artistic abomination, a quite needless, though frequent, achievement of the last century, which, we are sanguine enough to hope, may not in the newer age or be any longer considered inevitable.

In conclusion, the better and more monumental granite bridge of good design and permanent construction is what has been promised to London, proposed and authorised by Parliament; and this should certainly be carried out.

## ST. AIDAN'S CHURCH, DRUMCONDRA.

ST. AIDAN'S CHURCH, Drumcondra Road, co. Dublin. It was dedicated on Saturday last. The new church, although it is an unpretentious building externally, is not lacking in points of architectural beauty, and it is admirably adapted to serve its purpose. It consists of a nave measuring internally some 68 feet in length and 24 feet in breadth, with a side aisle 14 feet wide and 60 feet long, separated from the nave by an arcade of five bays. The arches are built in brick, thus affording a pleasing harmony in colour with the cool grey of the walls. The arches are supported on Bath stone piers, alternately octagonal and circular, with moulded capitals and bases. The chancel measures 24 feet by 14, and has a well-proportioned three-light lancet window over the holy table, and a pair of smaller lancet windows in the side wall admit the light of the southern sun. The chancel arch, all of Bath stone, with richly-carved bases or corbels to the responds, is one of the most effective architectural features in the church. The roof of the nave, chancel and north aisle is an open-timbered one, all constructed in pitch pine. The chancel is tiled, as are all the porches, and the rest of the church floor is laid in wood-block flooring, which is warm and silent to the tread. The old organ from the iron church has been erected in a temporary organ chamber in the south wall of the nave adjoining the chancel, and seating accommodation for the choir is provided in close proximity. The architect was Mr. R. Caulfield Orpen, B.A., from whose designs and under whose direction the entire work was carried out.



## PROTECTION OF STEEL FRAMING.

A REPORT has been prepared by Professor Charles L. Norton, Massachusetts Institute of Technology, who is in charge of the laboratory of the Insurance Engineering Experiment Station, Boston, on the corrosion of steel. An abstract of the report is given by the *Engineering Record*. The difficulty of cleaning the steel as done in the experimental work is so costly on the scale of practical building construction as to be prohibitive. It is true that structural steel is cleaned, but the result of the cleaning satisfies only a much less exacting definition of the term, clean, than that used in a laboratory. Protective coatings for steel are legion, and probably some of them would be effective if applied to the steel; but it has been the writer's common observation that the coating was put to a large extent upon rust, scale or foreign substances on the surface of the steel rather than upon the metal. The trouble is further increased by the fact that if the steel should be perfectly cleaned it would not remain cleaned long enough to be coated by the usual commercial processes. Absolutely clean, bright steel will flash rust, when exposed to atmospheric moisture, almost as rapidly as powder will flash fire. It would seem then, that what the practical constructor needs to know is not alone, or so much, what happens to steel when cleaned and coated under laboratory conditions, but rather what befalls the steel as ordinarily manipulated in the operations at mill and shop and in building construction. The latter line of investigation, it is understood, the director of the Insurance Engineering Experiment Station hopes to undertake in the near future, and in this undertaking he invites engineers and architects to co-operate.

The problem of steel framing for a textile factory, bleachery or dyeworks, paper and pulp mill, and the protection of the metal from both heat and moisture, is a very much more difficult one than the construction of a department store or office building. The working of the fibres of cotton and wool requires a constant humidity at a rather high degree, the working of pulp and paper generates great volumes of vapour which must be guarded against.

The constantly increasing use of steel as a structural material in modern buildings has led to many questions as to its permanency. The examination of buildings ten to fifteen years old, when, during alterations, the steel framework has been exposed to view, reveals all stages and conditions of disintegration of the steel. So great has been the corrosion, even in this short time, in some cases, that a note of alarm has been sounded by some engineers most familiar with the subject. The use of steel beams and posts is of so recent date that no very exact deduction can be drawn as to the time required for a very serious or destructive loss of steel through corrosion; but surely, when a steel plate one-half inch in thickness loses more than one-eighth inch in five years, there arises a question as to the ability of the structure to last more than twenty-five years.

Some of the factors in the matter of corrosion of steel we know; others we do not know, and cannot until after a lapse of some years. There can be no question that moisture and carbon dioxide are the active agents in causing much of the rusting of steel. To what extent the two are relatively responsible and in what measure they need renewal, to keep up the process, is uncertain. It has been held that the formation of a coat of rust upon the surface of steel was the beginning of a progressive action whereby the rust or iron oxide acted as a continuous carrier of oxygen to the steel beneath. This process seems to require only moisture and atmospheric air containing carbon dioxide to start it, but as to the depth of penetration of the process, no assignable maximum in any given time is known.

There can of course be no question as to the ease of access to the steel, in many cases, of both moisture and carbon dioxide. When steel is bedded in the wall of the building, as is almost always the case, the changes in temperature from time to time, is well as the more or less constant difference in temperature between the two faces of the wall, tend to cause a condensation of moisture in the wall at different points. Further, the necessary carbon dioxide is most plentiful in the large cities, where the steel frame is most common. When the walls of the building are of brick or stone moisture and carbon dioxide may enter at the joints, and to a greater or less extent through the body of the stone or brick. Few stones are, however, porous to such an extent as to allow an appreciable penetration. Terra-cotta tile is of itself porous, and the existence of air passages tends to increase the condensation of moisture and its absorption by the terra-cotta and possible contact with the steel. Concrete, made of Portland cement with sand and either cinders or stone, would seem to offer more protection to the steel than any of the materials just mentioned; yet we hear of the loss from time to time by corrosion of steel bedded in concrete.

It has been held by several engineers that the mere alkaline nature of Portland cement was a sufficient guarantee of its protecting steel from rusting. There is, of course, good

chemical reasoning for this, the familiar use of strong alkaline solution in boilers to prevent the formation of scale being based upon the same principle. This would seem to settle the matter once and for all, were it not a fact that steel bedded in concrete has corroded very rapidly, while other steel in a different concrete of the same kind of cement stands without change for ten years or more. An examination of several cases where expanded metal had been embedded in concrete showed plainly that wherever the steel was exposed through cracking rusting began, even though the cracks were very fine. It would seem that the alkaline nature of the cement would be sufficient to prevent corrosive action occurring within a few hundredths of an inch on the moist surface of the steel, but such is not always the case. To study the matter systematically, two brands of American Portland cement (Alpha and Lehigh) were selected; two kinds of cinders, one from a sugar refinery, the other from Boston and Albany locomotives; a sharp, clean beach sand; and a hard, clean broken stone, the larger part being fragments of flint and trap rock. Concretes were made up in bricks about 3 by 3 by 8 inches, with the steel specimens near the centre.

The following mixtures were tried at first:—Neat cement; cement, one part, to three of sand; one cement to five broken stone; and one cement to seven cinders. All briquettes were made in duplicate with both cements. There were later made up briquettes of one part cement, two sand and five cinders, and of one cement, two sand and five crushed stone.

It was hoped to vary the density, the porosity and the nature of the contact with the steel, as well as the chemical composition of the concretes. The cements were tested chemically and physically and found good. The cinders, when washed down with a hose stream and dried, tested distinctly alkaline, and analysis revealed very small amounts of sulphur. The stone and sand were thoroughly washed and clean. The ingredients were mixed dry in every case, and when wet thoroughly mixed and tamped until wet on top.

The cleaning of the steel was the most troublesome problem met with. It was necessary to scour the pieces, then pickle in hot dilute sulphuric acid, and finally dip into hot milk of lime. When cold the lime was removed with a wire brush. This left the steel clean and bright, ready to be put into the test bricks. The specimens used were a mild steel rod 6 inches long and  $\frac{1}{4}$  inch in diameter, a piece of soft sheet steel 6 by 1 by  $\frac{1}{32}$  inch, and a strip of expanded metal 6 by 1 inch, all three pieces being put in each brick. Since time would not permit of exposing these specimens to natural conditions, they were enclosed in several large tin boxes, sealed tightly and subjected, one-quarter of them to an atmosphere of steam, air and carbon dioxide, and a second quarter to air and steam, a third to air and carbon dioxide, and a fourth stood upon the table of the room, with no special care as to their temperature or dryness. Of the entire number, about one-half were set in water for one day the rest for seven days, before sealing up.

At the end of three weeks the briquettes were carefully cut open and the steel examined and compared with specimens which had lain unprotected in each of the tin boxes. The neat cement specimen can be dismissed without discussion, for the protection was perfect. The steel was as bright as when put in. The unprotected pieces were found to consist of rather more rust than steel. The steel was wrapped about pieces of uralite, to serve as a means of identifying it by number, the stamped numbers being nearly obliterated by the rust. Of the remaining specimens, hardly one had escaped serious corrosion. The location of the rust spot was invariably coincident with either a void in the concrete or a badly rusted cinder. In the more porous mixtures the steel was spotted with alternate bright and badly rusted areas, each clearly defined. In both the solid and the porous cinder concretes many rust spots were found, except where the concrete had been mixed very wet, in which case the watery cement had coated nearly the whole of the steel like a paint and protected it. Some briquettes made later of finely ground cinders and cement in varying proportions when exposed to moisture and carbonic acid showed how effectually the presence of cement prevented rusting, even in a highly porous mass—one cement to ten of cinder, provided there were no cracks or crevices or distinct voids.

From the examination of these several hundred briquettes there have been drawn several conclusions:—First, neat Portland cement, even in thin layers, is an effective preventive of rusting. Second, concretes to be effective in preventing rust must be dense and without voids or cracks. They should be mixed quite wet where applied to the metal. Third, the corrosion found in cinder concrete is mainly due to the iron oxide, or rust, in the cinders and not to the sulphur. Fourth, cinder concrete, if free from voids and well rammed when wet, is about as effective as stone concrete in protecting steel. Fifth, it is of the utmost importance that the steel be clean when bedded in concrete. Scraping, pickling, a sand blast and lime should be used if necessary to have the metal clean when built into a wall.



## NOTES AND COMMENTS.

THE strange story of the Diamond Necklace is recalled in Paris by the preparations for the demolition of the Imprimerie Nationale. That building was originally the Palais Cardinal, or Hôtel de Strasbourg, which was erected by ARMAND GASTON DE ROHAN, bishop of Strasbourg, when he was raised to the cardinalate. He was the dupe in the necklace affair. His palace became the Government printing office on the Bank of France acquiring the building formerly used for that purpose. At one time there was a large garden near the palace, which until 1808 was open for public use. There are some relics of the eighteenth century which will be removed to various museums. The carved woodwork is of great interest. But the most curious part of the building is the "Cabinet des Singes," which, according to tradition, was the cardinal's bedroom. CHRISTOPHER HUET painted the walls up to the ceiling with numerous figures of monkeys.

THE French ambassadors in Rome have occasionally occupied some of the most famous palaces. All the world knows that buildings of the kind, however grand or historic, are usually let out to a number of tenants, and an ambassador has as much right to hire a floor or a few rooms as any other visitor. Latterly the Rospigliosi Palace was occupied by the French Embassy, but the lease expired at the end of last year. It was not the first time to be so used. MAZARIN purchased the building from the BENTIVOGLIO family in order to convert it into a French palace. It was adorned by GUIDO's *Aurora* among other works. In 1704 it ceased to be French property. The building selected for occupation is the Santa Croce Palace. It was designed by FRANÇOIS PAPARELLI, and from 1769 to 1792 was used as a residence by Cardinal DE BERNIS, who was the representative of the French Court in Rome. In the court are several bas-reliefs. In the rooms are examples of Italian painting. The palace does not stand in one of the fashionable quarters of the city, but the rent charged for the first floor will be 25,000 frs. a year. In addition there will be an outlay on alterations which will be carried out under the direction of M. CHEDANNE. As the term of the tenancy is ten years, there is no likelihood of an immediate change in the relations with the Vatican.

THE invitation of the Liverpool Corporation to architects for designs for workmen's dwellings was responded to by the preparation of forty-five sets of drawings. Mr. THOMAS BLASHILL was appointed assessor. His award is as follows:—First premium of 250*l.*, Mr JAMES DOD, Exchange Buildings, Liverpool; second premium of 150*l.* to Messrs. BROCKLESBY, MARCHMONT & EAST, of Merton, Surrey; third premium of 100*l.* to Mr. A. MITCHELL TORRANCE, of London. The designs by the following architects were highly commended, viz.:—Mr. HUON A. MATEAR, of Liverpool; and Messrs. WORTHINGTON, SYMON & CRAWFORD, of Manchester; Messrs. SPINKS & M'JARROW, of London; and Messrs. GROVER, HALFORD & CUTLER, of London.

THE utmost praise which any member of the London County Council could bestow on the new design for the Vauxhall Bridge was that it resembled Westminster Bridge. That was Mr. EMDEN's opinion. It was forgotten by him that PAGE's structure did not meet with general approval, especially as regards ornamentation, but it was considered to be in keeping with the Gothic Houses of Parliament, and that any other style would not harmonise with the most important of the country's buildings. It cannot be said there is a like need for Gothicising the contemplated Vauxhall Bridge, as there is no building of any importance in that style to be found in the vicinity. Unfortunately, Mediæval ornament is assumed to have been mainly geometrical, and the curved lines to be parts of circles. That mode is consequently in favour

in engineers' offices. As the superintending architect of the London County Council is to be allowed to have a share in the preparation of the working drawings, we may hope that the architectural defects which mar the design recommended will vanish.

THE pamphlet on "Artesian Well Boring"—a class of work which is one of the numerous departments of the business of Messrs. MATHER & PLATT, LTD.—is a practical treatise on the subject. The particulars of over two hundred borings which are supplied indicate the remarkable variations of strata which have to be encountered before water is reached. The success of the system is shown by the numbers of water companies utilising it for supplies. Among them are the Southwark and Vauxhall (1,035 feet), Birmingham, Grimsby, Bootle (1,300 feet), Wirral, Stockport, Canterbury, Caterham, Liverpool, Slough, Wolverhampton (920 feet), Sunderland, Richmond (1,334 feet), East Warwickshire, West Cheshire. In some cases the boring was 26 inches diameter, at Port Sunlight one is 37 inches and at Rickmansworth are two of 40 inches. A boring at Lodz, Poland, is 2,250 feet deep and 33 inches diameter. The strata which had to be pierced consisted of clay, quicksand, chalk, sandstone and marl. As a rule the sandstones have yielded the majority of the supplies. As in the case of waterworks purity has often to be sought, and brewers, distillers, mineral water manufacturers, &c., are indebted to Messrs. MATHER & PLATT. It is stated that they are able to sink a hole 18 inches or more diameter at a fraction of the cost formerly required and in much less time. The supply obtained is cheaper than if derived from other sources, even in the vicinity of towns. Messrs. MATHER & PLATT employ either the round-rope system or the flat-rope system, according to circumstances. They find that the yield is increased by the adoption of air-lift pumping, and the water has the advantage of being aerated and thus becoming more potable, while it is better adapted for some manufacturing purposes. They have also a patent process for softening water in cases where it is very hard, and special filters with capacities ranging from 6,500 to 500,000 gallons per 24 hours. Water cannot be dispensed with either for domestic or manufacturing purposes. Accordingly an increased supply is everywhere recognised as an addition to the public wealth. Messrs. MATHER & PLATT have brought the sinking of wells to a perfection such as the good people of Artois or their predecessors could not have imagined in their dreams.

THE useful handbook on "Alphabets Old and New," by Mr. LEWIS F. DAY, has been followed by another entitled "Lettering in Ornament" (B. T. BATSFORD), which is practically a history and exposition of one class of art. The examples go back to an early period, and we find that letters were appreciated not only for their use as a substitute for sounds, but from the extent to which the forms lent themselves for artistic treatment. So many upright, horizontal, inclined and circular lines were recognised as elements of ornament which, although limited in variety, could cover a space with more or less success. The letters could also be surrounded with ornament and made to form part of a panel. "The Alphabet," by GODFREY SYKES, on page 189, is as fine an example of treatment as can be found. The small volume can be of use to many, and those who may not require to form letters can learn from the examples how art became the auxiliary of literature.

## ILLUSTRATIONS.

LIVERPOOL CATHEDRAL COMPETITION: DESIGN SUBMITTED BY MR. A. BRIGGS, F.R.I.B.A.—SOUTH ELEVATION, INTERIOR VIEW LOOKING EAST, SHOWING CENTRAL OCTAGON.

TELEPHONE HOUSE, VICTORIA EMBANKMENT, E.C.

CATHEDRAL SERIES: HEREFORD.—THE NORTH DOOR.  
A COFFIN LTD.



## THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Association was held on Friday evening last, Mr. H. T. Hare, president, in the chair.

The following were elected as members:—Messrs. L. L. Jeeves, C. D. Power, G. R. Bryce, H. Rigg, B. G. Gwyther, J. Swarbrick, G. A. Soames and A. C. Bosson. Messrs. P. M. Holden and H. W. Roberts were reinstated members.

Mr. C. C. BREWER read a paper entitled

## Sanatoria.

The principle which seems to have actuated your committee in their invitation to me to speak to-night on "Sanatoria for Consumptives," seems to have been this, that if you invite someone who but half knows his subject you are likely to get a livelier discussion than if you put up your expert, and by so doing frighten away other speakers. I am perfectly conscious that there are others here to-night much more competent to speak than I, but I was assured by the Secretary that none were willing to take up the subject, and as it is one on which I am most anxious to obtain information, I consented to act as a bait to these gentlemen, and I can only hope that they will be drawn by my remarks to give to the meeting some of the knowledge they undoubtedly possess.

I feel, too, that I am speaking at a not very opportune moment. I had hoped that before this date something would have been known as to the outcome of the King's Sanatorium Competition. That is to say, something further than the mere awards—that the essays and plans would have been published, and that we should have had a chance of seeing and discussing the plans accompanying the prize essays on the ideal sanatorium, as judged by the leading medical specialists. However, these have not been published, and nothing is as yet publicly known as to the form the building will ultimately take.

Let it be understood that I shall confine myself to sanatoria for the treatment of consumptives by the so-called open-air or "Nordrach" system, of which the two main features are open air and abundant feeding, though Dr. Walker will tell you that it means a great deal more than this. I shall speak first of these sanatoria generally, mentioning some of the most prominent of those already built, both for paying and non-paying patients, and shall then go on, if there is time, to discuss some details of construction and fittings. I shall not tell you anything about sites, aspect, climate. Those are all more medical than architectural points, and I shall leave them to Dr. Walker, who is to speak after me, and who will give you a description of the life of a sanatorium patient and of the essential points of the treatment, and will, from her very great practical experience of the treatment, answer any questions you may put, and give reasons for many of the things that I state as axioms.

Existing sanatoria as to their plans may roughly be divided into two classes:—Firstly, those built on a concentrated plan; and secondly, those on the cottage or block system; that is to say, they vary from the large hotel-like buildings, such as Falkenstein and Hohenhonnef, in Germany, both having five floors, to Nordrach and the American Cottage Sanatoria, with quite small blocks, having two floors at most. In comparing the two systems, it must be remembered that Nordrach, perhaps the most successful of all these sanatoria, is on the cottage plan, and there can be no doubt that, from a purely medical point of view, this plan is best; but the disadvantages in working are many and obvious, both as regards convenience and economy. The medical requirements are extremely simple. Every part of the building must be (i.) Well ventilated. (ii.) Free from dust and easily cleansed. (iii.) Patients' rooms, in addition to abundant fresh air, must have as much sunlight as possible, and must be protected from cold winds. (iv.) The building must be as sound-proof as practicable. The perfect sanatorium, therefore, will be the one that fulfils these requirements, and at the same time is convenient of management and supervision, provides reasonable comfort for patients in all weathers, and has not too much the appearance of a hospital or barrack, but which must not, on the other hand, degenerate into the hotel or hydropathic establishment.

At Nordrach which is rightly called a colony, the various buildings are scattered throughout the village at some considerable distance apart; some of them have been especially built, but others, such as the administration and staff offices and some patients' blocks, are merely old buildings converted, and it is generally admitted that the success of this sanatoria has been due to management, strict régime and the personal magnetism and enthusiasm of Dr. Walther, the founder, rather than to its buildings or site.

Nevertheless, some recent sanatoria in this country have been built closely following the Nordrach plan. One lately built has its dining-room, kitchen and staff offices on one side of a little valley, and the patients' rooms on the other, at least 200 yards away, and with no other means of communication between them than an uncovered and unsheltered path. Considering that in any sanatorium a certain proportion of the patients must be confined to bed, and must at the same time be

provided with substantial and appetising meals, such a plan is surely absurd, and I can see no reason why, because a sanatorium in the Black Forest has succeeded, in spite of such an arrangement, that we should handicap ourselves with it in England, and the cottage system seems unsuitable to our climate, but would rather suggest the large building spread over as much ground as possible, and so arranged that the parts may be easily isolated.

I propose now to show you the plans of some sanatoria built in Germany and elsewhere on the concentrated plan, discussing them as they are upon the screen.

1.—*Falkenstein*.—I have placed this first, as it was one of the earliest, and now is, perhaps, the best-known, German sanatoria, having been much advertised lately through the visit of our King, and it happens to be one which I have myself seen. This building, which was erected in 1876, accommodates 112 paying patients on five floors. There is a basement occupied by very large stores, bath-rooms, and offices, with a verandah in front, and above are three floors of patients' rooms. The lay-out is ingenious, but it is doubtful whether the central recess on the plan is an advantage, for the rooms in the centre are somewhat deprived of sun. The building generally is too much of the hotel type, and the number of sitting-rooms is altogether excessive and harmful, they are difficult to supervise, and are a temptation to patients to spend too much time indoors; it being now generally admitted that patients when indoors should be as much as possible in their own rooms, which can be thoroughly ventilated, and where talking and forbidden amusements are not indulged in. There are also too many mouldings, decorations, curtains, and other dust-traps about the building. The water-closets are not detached from the main building, and the ordinary baths are poor, except for the douche, &c., which are much used, and which are situated in the basement under the staff-rooms, and here the bathing is done under medical supervision, and the taps are placed outside the rooms. The dining-room, the one really important sitting-room in a sanatorium, though a fine room, is not well placed, having only north and east aspect. The patients' rooms are 13 feet to 14 feet high, which is quite unnecessary and even inconvenient, 8 feet 6 inches to 9 feet having been found in practice to be quite an efficient and convenient height. But to take the chief objection to this plan last, the patients' rooms are placed on both sides of corridors, and it has become an axiom that patients' rooms should only be placed on one (and that, of course, the south) side of a corridor; in other words, that your patients' block must only be one room thick. This has been realised in Germany now as well as in England, as you will see in the plans of more recent German buildings which I shall show immediately.

2. *Hohenhonnef*.—This closely resembles the Falkenstein plan, but is, I think, an improvement on it, as it should be, having been built sixteen years later. The wings here are shorter, so that the centre is not so shut off from sun. The dining-room with east and west aspects and the complete blow through is better, and on the upper or patients' floor the central portion is only one room thick, and the water-closets are partially isolated. But we get the same excessive number of sitting-rooms and the same number of storeys. In both these sanatoria, which are for paying patients, there are bedrooms for visitors and friends of patients, and these, together with the number of reception-rooms, lead one to suppose that the life more nearly approaches to that in a large hotel than would be allowed at Nordrach and Falkenstein.

3. *Ruppertsheim*.—This sanatorium for the poorer classes, built about six miles from Falkenstein in 1895, is as regards plan and arrangement to be a great improvement on the former. The building was originally planned to accommodate men in the west and women in the east wing, and was so being used when I visited it; but a new sanatorium for women was then being built close by, and the whole of the old building was to be given up to men. The arc form is distinctly good, although the thickening of the ends seems a mistake, and overshadows the rooms next to them. The room and corridor plan has been adopted, so that by the use of fanlights over doors an excellent blow through may be obtained. A dining-room and a day-room are the only sitting-rooms provided, but there are ample open-air galleries. The basement contains, beside the day-rooms, douche-room, stores, cellars, heating chambers, &c.

On the first and second floors the dining-rooms occupy the centre, one being for men, the other for women, and there are small pantries off them, a certain amount of the light housework being done by patients, both men and women. The bedrooms are arranged for one, three and five beds respectively, but at the time of my visit were being used for larger numbers than these. This dormitory arrangement can only be tolerated on the ground of expense, and possibly in the case of very poor patients who, Dr. Walker tells me, do not always appreciate the luxury of a single room. But anyone who has slept for many nights in the next room even to a coughing consumptive patient will realise how essential separate rooms



are. Here the sanitary arrangements are fairly isolated, and for the most part good, except for the earth closets, which are of a strange and wondrous pattern—that is to say, they are on the soil-pipe plan, this pipe being a 9-inch glazed stoneware one, and as it bends and twists and is jointed to connect to the closet below, the result may be imagined, and I could well believe the doctor when he assured me that they must shortly be abolished and water-closets put in. Two small buildings on the extreme west of the plan are objectionable, being pigstyes, and comfortably placed between the open-air gallery and the scullery. In spite of these objections the buildings are well laid out and built, and as there is no ornament and reasonable precautions are taken to avoid the lodgment of dust, they struck me as in every way better than those at the parent institution, Falkenstein.

4. *Alland*.—This sanatorium, which was opened in 1897, is 30 miles from Vienna, and at present accommodates 118 patients, but the grounds, farm, laundry, lighting, laboratory and other blocks are sufficiently large for a sanatorium for 300, and new patients' blocks will shortly be built to bring the number to this total. This sanatorium is particularly interesting to us in England at this moment, as in present size and completeness it closely approaches the King's scheme. It is intended for patients of the poorer classes, the charges being about 30s. per week for first and 12s. per week for second-class patients. The patients are accommodated in dormitories as at Ruppertshain, but here each dormitory accommodates eight patients, except for six small rooms to accommodate two each. The lay-out of the main patients' block is fairly good as a whole. The sanitary blocks are not, of course, sufficiently isolated for English ideas. But the chief fault lies to my mind in the size of the dormitories, and the fact that each acts as a passage-room for at least one other. As at Ruppertshain, the washing is done in the lavatories and not in the bedrooms, excepting in the case of patients confined in bed, and where dormitories are used, this is the best arrangement, though where separate rooms are provided it is a very vexed question as to whether washing and bathing should be done in the rooms or not. At Nordrach, where great stress is placed upon bathing, each room is provided with a shower-bath, and in other sanatoria a fixed lavatory is placed in each room. The disadvantages in having wash and supply pipes in rooms are obvious. It is better to have all washing and bathing done in separate rooms, allowing washstands and baths, which may be connected only to the first-class of patients and to those too ill to walk to the bath-rooms.

The dining and kitchen block are to the south-east of and rather lower than the patients' block, the ground floor being on a level with the basement of the latter, to which it is connected by a covered way. There are two basements to this block, used for cellars, servants' rooms, offices, &c. This dining-hall is a well placed room, and the cooking arrangements seem excellent. Alland, like the projected King's Sanatorium, has a fine laboratory block with mortuary and dissecting-room, also a scientific library and accommodation for one or two foreign medical men who may wish to visit the place for purposes of study; there is also an electric-light house, laundry and model farm. These are detached from the main building, and as they are similar to those which must be provided for any general hospital, the whole is very well and fully set out in the Alland Sanatorium Association's report, published in Vienna, which contains full plans, diagrams, &c.

5. *Albertsberg*.—I have included this among my slides, for it seemed an interesting plan for an inexpensive poor patients' sanatorium, the cost having been but 125 $\frac{1}{2}$  per bed against 173 $\frac{1}{2}$  per bed at Ruppertshain and 240 $\frac{1}{2}$  at Alland. The dormitories here are for ten beds each, but there are said to be eight single-bedded rooms in the block behind the dining-room. This seems a mistake, for they must, unless the slope in the ground is very great, be somewhat cut off from light and air. Another and very obvious fault is that the open-air galleries are too much sheltered between the blocks; but there seems an idea in the plan, and the use of the dining and sitting-rooms as passages seems an expedient to which no real objection can be taken.

Before leaving these German sanatoria, let me add that they all, except the last, appear too high, having five floors. This, even though the stairs be made easy of go, places too great a strain upon consumptive patients.

Having shown you plans of several German buildings, may I be permitted to show you the plan of a small English sanatorium, namely, that built for the East Anglian Sanatorium Company at Nayland, Suffolk, and of which Dr. Walker is the medical director? This building was originally intended for twenty-eight paying patients, but seven more rooms were fitted up in the roof during construction. Slightly radiating wings were adopted; the angle which these make with the centre has been found to be about right, that is to say, they afford a certain amount of shelter without shutting off the sidelight from the centre. Each wing contains six ordinary patients' bedrooms (10 by 14 by 8 feet 6 inches) on

each floor, and larger bay rooms at each end, those next the open air galleries being given up to staff officers' rooms so that control is always kept over patients in the galleries and also over the corridors. Practically the whole width of the south wall is window from 2 feet 6 inches sill level to the ceilings. A corresponding light is put in right across the north wall of the room above 6 feet high, and again in the corridor opposite, so that a complete blow through can be obtained.

The sanitary blocks are placed centrally behind the patients' blocks, and a nurses' room at each end close to the secondary staircases. The administration block is at right angles to the main block with a passage through to the dining-room which is an almost detached room. The small passage connecting the administration block with the dining-room was originally planned as an open verandah, but after one or two south-westerly gales which had an unfortunate knack of upsetting nurses with trays passing to patients' bedrooms, glass screens had to be fitted, which in really fine and settled weather can be removed. If one short length of corridor open on one side proved itself inconvenient here, it seems to me that a cottage or villa block sanatorium could never be a success in English climate unless the blocks were connected by enclosed passages either above or below ground, or unless each block was provided with kitcheners and full equipment for serving meals, and either of these two expedients would be exceedingly extravagant and there would be no corresponding advantages. Stretching eastwards from the dining-room come the kitchen and offices, with extra larders and stores in a basement under the east end of the block. Here an open corridor is provided, but there is a passage-way through kitchen and pantry, which can be used in windy weather. There is no first-floor over the dining-room and kitchen block. On the first-floor over the administrative block is a pathological room, and sewing and linen-rooms. The front portion of the first-floor is similar to the ground floor. On the top floor on the east side are patients' room, and on the west nurses' and servants' rooms. Owing to the slope of the ground the administrative blocks are midway between the ground and first-floor patients' room, so that patients on either floor have only to go up or down one flight of steps to reach the dining-room.

I have chosen these plans from those available, almost haphazardly. Open air sanatoria are being built all over Europe and North America. They are to be found in Africa, and I learn from the highest authority that Wei-Hai-Wei is considered a suitable position. In Switzerland, of course, are many of the best known ones, though I do not think that these are constructed on the latest and most scientific methods. You will probably have realised how extremely simple the planning of small sanatoria is. Difficulties undoubtedly increase enormously directly the members to be accommodated increase. You are then at once confronted with the question of area covered, and distance from dining-room and kitchen, and the number of floors allowable. As it is exceedingly important that patients should dine in the general dining-room as often as possible, this question of the distance of the patients' rooms from the dining-room is really a vital one. It has sometimes been suggested that the buildings should be built on a great number of floors, and lifts provided. Against this there are two objections—(1) The fear that the lower rooms may ventilate into the upper; (2) the expense of running the lifts, which would have to be very large, as they would be chiefly used in going to and from meals, and therefore by practically the whole of the patients at once.

As to construction, everything that applies to general hospital construction applies here, but an effort should be made not to give the place too much of the hospital air. In this climate verandahs outside the bedrooms are generally considered a mistake. The open-air galleries should be placed either in between the rooms (I have sometimes wondered whether the ideal plan would not be to have one between every alternate room), or at the ends of corridor or quite away from the house. They should not be less than 10 feet deep, and there should be ample space laterally, say 8 feet to each person. When I visited Falkenstein and Ruppertshain the couches in the open-air galleries seemed much too close together.

*Ventilation*.—In some German and some American sanatoria mechanical ventilation is resorted to. But this seems a great mistake—one of the objects of the treatment is the hardening of the patients, and for this there can be nothing better than open windows. Casements opening in have been found the best form of window. Sashes only allow of half the window-space being used for ventilation, and casements opening out are most troublesome and noisy in windy weather. The upper parts of the windows should be hopper hung or on centres, and it is a good plan to have lift butt hinges to the casements so that they may be taken right away in hot weather. Open fireplaces, except for appearance in sitting-rooms, are not advisable on account of the dust, and low pressure steam is generally admitted to be the best form of heating. Hot water would, of course, be preferable, were it



not that in sanatoria the temperature of rooms may fall below freezing, and there is a danger of burst pipes, and as the radiators are chiefly used for a short time while patients are dressing, hot water will not heat them rapidly enough. Besides, with very long, low buildings such as I have been advocating, hot water cannot be efficiently used.

The best position for the radiator in patients' rooms is another point to be settled. I show you three plans of patients' rooms at Falkenstein, at the East Anglian Sanatorium, and at a sanatorium recently designed. The position of the radiator in the last, under the windows, has been severely criticised by doctors as not efficiently heating the room, and the other position is probably the best. The foot of the bed has been suggested, and the place seems an excellent one, were it not for the difficulty of moving the bed. The radiators should be fixed at some little distance from the wall to allow of dusting behind, and should be of such a pattern that a brush can be used between tubes. The doors of patients' rooms and open-air galleries should be made large enough to allow of beds being wheeled in and out with ease.

The flooring of patients' rooms and corridors is a question to which a great deal of attention has been given—smooth, plain linoleum is probably the best for both. Tiles, parquet or mosaic, are excellent, except on account of noise, and this is of the very greatest importance. Sanatoria with long lengths of corridor and a number of rooms having both doors and windows sprung on to them are apt to be so noisy as to have a really bad effect on nervous patients, and everything in the way of rubber door stops, silent window fastenings and noiseless floor coverings must be adopted. Probably the indiarubber flooring now used in banks, &c., would be the best if expense allowed. The floors of the dining-room may very well be of hardwood, and of the open-air galleries unglazed tiles.

Fixed hanging cupboards running up to the ceiling are better than wardrobes, as dust underneath, behind and on the tops of the latter is avoided.

Electric light is, of course, the best form of illuminant, and its advantages are so great that it should be installed almost at any cost. It is necessary to have the fittings arranged so that the lamps shall not swing and be broken by the draughts that blow through the rooms, and, of course, to have the switches in patients' rooms within reach of the bed. It is also well to have at the same point an extra plug, which may be used for keeping plates warm or for a lamp for examining throats. Here also should be fixed the push of the bell to ring in the servants' bedroom.

As to the height of rooms, 8 feet 6 inches or 9 feet at most has been found a good and convenient height. There are many who will criticise this, and it is not in accordance with the custom of continental sanatoria, where rooms vary from 12 feet to 14 feet. The advantages of low rooms are:—(1) The reduction in the height of the building, consequently in the number of stairs; (2) the reduction in the cube, and consequently the cost of the building; (3) the convenience of cleaning, the top corners being easily reached with an ordinary mop; (4) the ease of opening the top lights of windows. With such low rooms the windows must be tight up to the ceiling. After all, if patients are to live in a constant stream of fresh air, it matters not whether that stream is 8 feet 6 inches or 14 feet deep.

Before concluding, may I recapitulate what seem to me the chief points to remember in designing the ideal room of a consumptive patient? The room should face south or south-east, should be ventilated back and front, as should be the corridor behind. The windows should be the full width of the room, and the sill low enough for the patient to see out when lying in bed, and should be carried right up to the ceiling; they should open inwards and to their full extent, as well as being entirely removable. Open fireplaces should be avoided, and the heating provided should be such that the room may be warmed speedily. The doorway should allow the bed to pass. The room should be as close to dining-rooms, bath and water-closet as possible, and separated from them by the least number of steps. The usual hospital precautions against dust should be taken, and the walls and floor should be made as sound-proof as possible. In conclusion, let me recommend to any one wishing to study the subject Dr. F. R. Walter's exhaustive work, "Sanatoria for Consumptives," to which I am indebted for some of the plans shown to-night.

## II.

### Notes on the Construction of a Sanatorium from a Medical Point of View

read by Dr. JANE WALKER:—

In building a sanatorium for the treatment of consumptive patients, we must keep ever before our minds the meaning of the so called "open-air treatment." This term, which has come into very general use, is a convenient one, but is apt to be misleading, for it has led, not only the general public, but even people in authority, to assert that all that is required is open air, and that, if windows are only opened, consumption will diminish, and in time cease to exist.

Now the sanatorium treatment of consumption is a great deal more than this. It is a minute and elaborate system made up of endless details, all of which are important. It is not enough to say, open all windows in all weathers, and all will be well, nor even to add, feed all patients very plentifully. With these two points, essential as they are, must be united careful regulation of exercise and rest and constant medical supervision. No two cases can be treated on exactly the same lines; the sick individual, not the individual sickness, must concern us, in other words the reaction of a patient to his environment is a very important element in the cure of consumption. The moral qualities which most aid consumptives in recovery are, firstly, strength of will; secondly, common sense; thirdly, equability of temperament. Therefore, the essentials in the treatment of consumption are to preserve and strengthen the physique, to enforce prudence and to induce placidity. Hence it follows that a sanatorium which is designed to be an ideal establishment must be arranged (so far as is possible in a mere structure of bricks and mortar) in such a way that not only the physical, but the mental and moral well-being of the patients may be taken into consideration.

In building a sanatorium for a large number of phthisical patients, the points which must be kept specially in mind are that, just as overcrowding and want of sunlight and fresh air are factors in promoting the disease, so abundant space for each patient, and, if it may be so stated, a superabundant supply of fresh air and light are, among the chief means of combating the disease. Abundant sunlight and fresh air are necessary on two grounds: firstly, because they tend directly to kill the organisms of disease; and, secondly, because they increase the patient's power of resistance; whereas, impure air keeps him in a low state of health, and so renders him an easy prey to the inroads of the tubercle bacillus.

There is in some minds a great feeling against treating patients in a sanatorium instead of in their own homes, partly because of the supposed danger of massing a large number of consumptive patients together, and partly because of the fear lest the treatment in a sanatorium should degenerate into a mere routine, by which every patient is treated exactly alike. The first danger is overcome by (in addition to antiseptic precautions) spreading the sanatorium buildings over a large area, in a somewhat isolated spot; and the second by realising that the sanatorium treatment is essentially individualistic. In a sanatorium the treatment of consumption is continuous—it does not consist in prescribing a dose of medicine and then giving no more attention till the following day, but it lies in ceaseless care and attention every minute of the time. For example, the amount of food, the amount of exercise and rest, the time that may be given to employment and recreation, the kind of employment and amusement, and every detail of the daily life is carefully regulated according to the requirements of each individual patient. A good deal of the necessary routine of the open-air treatment is irksome to most patients, and is easier to bear if the sufferer be one of a community all the members of which are undergoing the same strict regimen.

The following conditions are necessary for an establishment for consumptive patients:—The building must be placed on a slope facing south, and at such an elevation above the surrounding country that an air is insured free from the impurities caused by industrial establishments, business or traffic of any kind. The building should be therefore in an isolated district, far from lines of traffic, and should be at a considerable distance from any town or large village. It should be so constructed that patients can be distributed over a considerable space, and that there may be constant and efficient ventilation. The building should be surrounded by woods, meadows and streams, and the farm should be at some distance from the sanatorium.

The sanatorium should be so constructed that the strictest attention can be easily paid to cleanliness; the heating should be by some central system. The greatest restrictions should be placed upon all accessories, such as carpets and curtains, &c., which may harbour dust, and the lighting should be by electricity. But as, in spite of the best ventilation, the air inside a building is never so pure as that without, arrangements must be made to allow of patients spending as much time as possible in the open air, so that the rooms are used practically for sleeping only. In this climate verandahs are a mistake; they keep off sunlight and air. There should be covered shelters either quite away from the house or built as an extension of the corridors.

A very important element in the possibility of constantly living in the open air, and of rational ventilation, is protection from wind. This can best be obtained by placing the building on the slope of a hill at some distance from the top and facing nearly due south. A south wind is rare, and as it nearly always brings rain, it cannot bring dust, and therefore is the least harmful that blows. Another point in the efficient ventilation of the building is the construction and situation of the windows. It is essential that the patients' part of the



building, at any rate, should be only one room thick, the rooms facing south, with a corridor behind, into which open windows facing north. Each patient's room should have practically the whole of the south side window space; the lower part of the window should be of the casement type, as sash windows at the best only allow of half the available space being used as fresh air inlet; the upper part of the windows should be flaps or casements, falling inwards. On the north side of the rooms should be a similar series of upper windows which should be opposite to the windows in the corridor.

In a building such as this, standing in complete isolation, the only source of infection can be from the patients themselves. To eliminate risk from this source as much as possible, all excreta must be rendered harmless, and care must be taken that no infectious disease be able to spread. The means by which this is obtained are by total prohibition of all promiscuous expectation, by providing each patient with a suitable portable spitting flask when he is out of his room and placing a properly fitting cup in each bedroom; by having a disinfecting chamber for furniture, clothes, bedding, &c.; by having walls that can be washed and floors that are impermeable. All these measures should be taken, not only to render the tubercle bacilli harmless, but also to eliminate the various other micro-organisms which endanger health.

Owing to these precautions, the prophylactic treatment of persons of a phthisical tendency, especially children, can go on side by side with that of consumptive patients.

As carefully regulated exercise and rest play important parts in the curative treatment of consumption, it is necessary in an establishment of this kind to have due facilities for carrying out these two factors in the treatment. The great end in view is to strengthen the heart and body muscles, and with this object the building should be surrounded by a sufficient number of paths at varying gradients, some shady, some sunny, and all free from dust. Arrangements should be made for sufficient rest and avoidance of over-exertion by providing a large number of benches and covered seats at intervals along the paths. There should also be a suitable couch in each patient's room, and an ample supply of reclining chairs in all the shelters of a kind which will not be injured if left out in all weathers. The extent and duration of all patients' walks must be fixed daily, and notes taken of patients' pulses, temperatures and conditions as to fatigue, sweating, &c., on their return from exercise. The attention to all these details necessitates constant medical supervision.

The subject of the sanitation of a sanatorium is important. In view of the fact that the Royal Sewage Commission in their interim report practically admit the possibility of bacterial processes producing reasonably good effluents, it would seem that either land treatment, or treatment by one or other of the bacterial processes, might be adopted. The exact method of sewage disposal will depend on the nature of the soil surrounding the sanatorium, and also on the slope of the ground. If the soil be light sandy loam, and the slope and other conditions favourable, land treatment should be preferred. If, on the other hand, the soil be peat or clogging sand, such as Bagshot sand, probably a septic tank, followed by some form of bacterial bed, will be the best method.

Whether land or bacterial process be chosen, a septic tank should be interposed to hold back solid matter, much of which will be liquefied when septic action is started.

In dealing with the land system, some experienced person is needed, who will treat the land carefully, so as not to let it get "sick," and also obtain the best possible results in the way of crops—e.g. cabbages, rye grass or other growths.

If one or other of the forms of bacterial beds is to be used, Dibden's contact bed, Whitaker's continuous process, Duckett's aerobic self-acting continuous filter, or Scott Moncrieff's process may be adopted. It is impossible to say which of these processes is the best, but from the London County Council experiments carried out at Barking and Crossness, it is extremely doubtful if any of them can be relied on to destroy pathogenic germs. In the case of the land effluents the destruction of pathogenic germs could not be relied on, but no doubt mechanical separation of the organisms takes place, and also the process being slow as compared with bacteria beds, pathogenic germs would be more apt to be destroyed.

Considerable difficulty arises if the effluent must go into a watercourse which, in its turn, runs into streams or rivers supplying water which is to be used for drinking purposes. Provided the water is not subsequently to be used for drinking purposes, sterilisation might be disregarded, if the effluent were non-putrescible and incapable of creating any nuisance. Probably the Mersey and Irwell standard will suffice.

But with regard to effluents running into streams used for drinking water, the subject is very complex, and until the Royal Commission on sewage disposal has made some definite pronouncement on the matter, it would be rash to express too definite an opinion. Personally, I should be inclined to say that complete sterilisation, that is, destruction of all spores as well as bacilli themselves, is impracticable, except in a very

large establishment, on account of its extreme costliness. Therefore the point to be aimed at is to consider whether partial sterilisation, to the extent of destroying the tubercle bacillus, is also impracticable. On this point the greatest diversity of opinion exists. Available data do not permit of a definite pronouncement being made. Thermal processes, though on theoretical grounds the best methods, cannot compete in point of cost with chemical methods. The ozone method has been tried, with apparent success, on the Continent, both with water and sewage effluents, but the cost of installation is a serious element. I should feel inclined to advocate the use of chlorine compounds; for example, bleaching powder, or else sodium hypochlorite. These chemicals are cheap; the former can be bought anywhere, and the latter from the United Alkali Company, and they are possessed of conspicuous germicidal properties. But whatever process be adopted, the effluent, to be of any value, must first be brought into a chemically pure condition, such as has been attained by the Mersey and Irwell Board.

To supplement the remarks of Mr. Brewer on the internal arrangements of the sanatorium, I have a few observations on the treatment of the walls. The walls of the bed and sitting-rooms and of the corridors should be painted or colour-washed with some cheap material. It is not advisable to have varnished walls. There is a constant percolation of air through the ceilings and walls of ordinary dwelling-houses sufficient to materially aid in their ventilation. By varnishing walls not only is the air prevented from gaining access to the rooms, but a cool surface is presented upon which in cold weather the warmer air of the rooms condenses and a continual state of moisture of the walls results, which, especially in damp or foggy weather, may be described as sweating. I have found, by personal experience of a varnished bedroom, that all metal things, such as keys, scissors, &c., are continually rusty, and that the room tends to have a damp, musty smell, and that in spite of perpetual open windows. At the Pinewood Sanatorium I was interested to find the other day when I visited it that they have similar difficulties owing to varnished walls. There is constant moisture on the walls, and all their metal things, such as the edges of the temperature chart-holders, get rusty and tarnished, and so much is this the case that they are putting radiators into all the rooms to try and dry them by heat. I doubt myself whether they will not find that the rooms will have to be heated to a high degree, and that constantly, in order to make any appreciable impression whenever the weather is either cold and damp or cold and dry.

The moist condition of the walls is not only unpleasant, but is certainly injurious, as germs tend to breed in moisture, and though varnished walls can be readily washed and cleaned, yet unless they are done most thoroughly every day and every part of the wall is dried, I consider that such accumulations of moisture are a very distinct drawback. It is not so much that the walls are likely to be harbours of the tubercle bacilli, as that anything which forms a nidus for any kind of micro-organism is to be highly deprecated in a building which sets out to be upon correct hygienic principles.

If walls are colour-washed and done again as a routine thing from time to time, and the walls of the bedrooms are done always when a patient leaves the sanatorium, the expense is not great, and the certainty that the walls are clean and aseptic is secured.

The description of the daily *régime* of the sanatorium may not be without interest to many here. Breakfast is at 8 or 8.30 o'clock. Before breakfast the doctor visits each patient, and after hearing how he has slept, and what are the pulse and temperature, maps out the morning in accordance with these conditions. Those patients who are well enough to be out and about take their prescribed amount of exercise some time before 12 o'clock. From 12 to 1 o'clock all patients rest on long chairs, either in their rooms or out of doors. During this hour they are again visited by the doctor, who settles what they may do during the afternoon, and all temperatures are registered at 12 o'clock. At 1 o'clock is dinner, which generally consists of three courses. Each patient is given, and expected to eat, the amount of food provided, for the doctor supervises each helping, and though, in common with many other medical people who have to do with the care of consumptive patients, I do not feed patients so largely as I used to do, yet it is really surprising how cheerfully and willingly patients eat three substantial meals daily when they are out in the open air from morning to night.

After dinner patients again take a regulated amount of exercise, and from six to seven o'clock they rest before supper, which is at seven o'clock, and is on the same lines as dinner, though it is generally a rather lighter meal. During the evening rest hour the patients take their temperatures again, and are again visited by the doctor. Of course, patients who are quite confined to bed, or those who are at all weak, have their meals taken to them, either in their rooms or out in the garden. Those who are quite in bed often require to be fed by a nurse, and therefore in any sanatorium in which any but slight cases



are to be taken, the accommodation provided for nurses must be ample, for in a day such as I have described full of endless small, but important, details, a day so arranged as to guard against the slightest fatigue on the part of the patient, good and efficient nursing is one of the most important points. All patients who are in bed entirely have a visit from the ubiquitous doctor before they settle down for the night. It is of the highest importance to realise the point that in the treatment of consumption the patients must be considered and treated individually. There must be no massing them together, either physically, so far as the building is concerned, or mentally, so far as the doctor is concerned; the ordinary red tape of a hospital routine will not work with consumptive patients. With some the visit of the most harmless and unscintillating old lady will send the temperature up a degree or two; others suffer from boredom, and require, and are the better for, some amusement and the visits of friends occasionally. Four visits a day from one's medical attendant may seem excessive, especially when one is suffering from a complaint which is likely to last for months, if not for years; but it is, in all cases where phthisis is at all active, necessary to watch closely the effect of exercise upon the pulse, temperature and respirations of each patient, and to note at once any signs of fatigue. Probably one of the secrets of the so-called "open-air" system lies not really so much in the open air as in daily, intelligent and tactful management of each individual patient.

Mr. E. T. HALL, in proposing a vote of thanks to the readers of both papers, said the subject was one of great interest, and was engaging the attention of both medical men and architects, especially those architects who practised particularly in hospital work. The King's proposed scheme had given an impetus to the study of the requirements in such work. The great height of German sanatoria was a mistake. It meant much fatigue to patients climbing upstairs, or if lifts were used great cost in the initial outlay. For such buildings two storeys were an admirable arrangement. Adequate centralisation in large blocks was a great difficulty. Verandahs were hard to plan successfully. The better arrangement would be to have the windows carried down to the floor level. If there were many points to admire in the German plans, there were, however, certain things to avoid. The Germans did not seem to adopt the first principles in sanitary administration, a matter that was of the utmost importance. With reference to the size of rooms the speaker agreed with the writers of both papers. High and large rooms were not necessary. A cube of about 1,100 feet was ample in rooms of that type.

Mr. K. D. YOUNG seconded the motion, supported by Drs. Hudson and Wethered, and Mr. Arnold Mitchell.

### THE ARCHITECTURAL MUSEUM AND THE ASSOCIATION.

A SPECIAL general meeting of members of the Architectural Association was held in the rooms of the Royal Institute of British Architects on Monday evening to consider proposals which had been made by the Royal Architectural Museum and Westminster School of Art. Mr. H. T. HARE, president, occupied the chair.

The PRESIDENT, in opening the meeting, said:—The object which calls us together this evening is one of the greatest importance to the well-being of the Architectural Association, and the present meeting promises to be an historical one in its history. It is therefore gratifying to note by the numbers present that the decision to be arrived at will receive the endorsement of a large proportion of our members, and will be no hasty one, but will be considered from all possible points of view. It may perhaps be useful for me to recapitulate the history of the negotiations which have led to the calling of this special general meeting. The need of adequate premises for the work of the Association has been one which has pressed itself upon us for many years, but although it has been felt in the past, I do not think there has been any period in our history at which that necessity has been so urgent as it is at the present moment. Previous to the year 1891 the work of the Association was comparatively limited, and no serious attempt was made at actual architectural education. Two or three rooms were occupied in this building sufficient to accommodate what was then a very small library, and practically no staff except a voluntary one. Our meetings were held in one of the galleries on the ground floor. When the studios and various other classes were established it was necessary to acquire greatly extended accommodation which it was not possible to find here, and the present premises in Great Marlborough Street were taken. These promised to serve our purpose for many years, although lacking the dignity and importance which a Society of this nature should be able to command. The work and scope of the Association, however, increased year by year, and every session more consideration was required in order to arrange for the classes to be carried on smoothly without friction.

Two years ago my immediate predecessor in the chair,

Mr. Seth-Smith, initiated a movement with the object of raising funds for the erection or acquisition of new buildings, and *pari passu* for the establishment of a day school for the training of prospective architects. The former project, though prosecuted with unbounded energy and with a considerable measure of success, appeared to have its realisation largely in the future. The profession of architecture is not in the main a wealthy one, and we cannot look for any very extended support from the general public, who are lacking in interest and appreciation of our art. The funds collected and promised up to the present moment, though amounting to a substantial sum, are still hardly one-quarter of the total which was estimated to be required, and the collection of the remaining three-quarters would probably be a work of some years. The second project, that of the establishment of the day school, has been, however, entirely successful, and is now proceeding in a manner which exceeds the most sanguine hopes with which it was initiated. The numbers attending and the enthusiasm with which the students are prosecuting their studies give every promise for increased success and usefulness in the future. The success of the day school has accentuated the need for more room to an extent which was hardly anticipated, and the want is now so pressing that unless we can secure what we require at once the work must be curtailed and cramped just when circumstances are most favourable for expansion. At this juncture a most fortunate circumstance has occurred, and a proposition has been made to the Association which appears to show the way out of all our difficulties, and this in a manner well within our means. The circular which called this meeting together briefly stated the nature of this proposal, which is that we should take over the buildings now occupied by the Royal Architectural Museum and Westminster School of Art in Tufton Street, Westminster. The majority of us are probably familiar with the building, which has been maintained successfully for a number of years. The premises consist of a large central hall surrounded by galleries containing an immense and unique collection of casts, the value of which it is impossible to estimate, but which probably amounts to many thousands of pounds, together with eight large studios and office accommodation. The Council of the Royal Architectural Museum propose to hand over the whole of these premises to the Association, together with the equipment and collection of casts, without any payment beyond a deficit estimated at about 700*l.*, and on condition that the museum shall be maintained and be accessible to the public, as heretofore. There are one or two minor conditions, but these are not material.

I should, perhaps, explain that the deficit will be mainly attributable to the comparatively sudden closing of the school of art which is carried on in the premises, and which has been a substantial source of revenue. The buildings are held on two leases from the Ecclesiastical Commissioners, one of which expires at Michaelmas 1926 and the other at Christmas 1976, at a total rental of 140*l.* per annum. The rates and taxes amount to about 17*l.* per annum, making a total of 157*l.* per annum. The rental of our present premises in Great Marlborough Street is 380*l.* per annum. Possession of the Royal Architectural Museum can be given to us on March 25 next, and by the terms of our present lease we can vacate the Great Marlborough Street premises on June 24 next by giving notice next Christmas. The proposal and the conditions have been very carefully considered by the committee of the Association in all its bearings, with the result that they are unanimously prepared to accept the gift with gratitude, and the transaction now only requires confirmation by the general body of members. The committee took into consideration the following points:—1. The position of the Royal Architectural Museum and its accessibility. 2. The adequacy of the premises to our requirements. 3. The leases. 4. The alterations required and their expense. 5. The terms of the transfer.

With regard to the first, that of position, we concluded that any disadvantage there might be in position was more than counterbalanced by the fact that the building is universally known throughout the profession, and also one which has an extremely interesting past history. There are also the facts that the museum is in close proximity to the Church House, Westminster Abbey, the Houses of Parliament and other notable buildings, and that the entire district is rapidly improving in all respects. Westminster, too, is fast becoming the home of all kindred societies. As to the second point, that of the adequacy or adaptability to our requirements, there can be no question that there is ample room for all our classes. The only point on which we are in some doubt is as to whether we can arrange to hold our meetings there, or whether it will still be necessary to have them here or elsewhere. We are hopeful, however, that a meeting-room may be arranged on the premises. The Westminster School of Art has for some years been carried on in the studios, so that they are well adapted for the purposes for which we require them. The third point as to the leases, or rather the lease which expires in 1926. This gives about twenty-four years, and we considered that



this period was long enough to warrant us taking the risk of being able to secure a renewal at the end of the term. The fact that the other lease is for a much longer period should prove of some assistance, but in any case it is proposed to approach the Ecclesiastical Commissioners at an early date in order to ascertain what arrangements can be made for extension.

The fourth point is as to the alterations and their probable cost. This question the committee have been unable at present to go into exhaustively, but a sub-committee has been appointed to consider the matter and prepare a report with suggestions. It is evident, however, that the sum which has been collected and promised towards the Premises Fund will not be more than sufficient to carry out all that we shall want. The subscriptions having been given on the assumption that a new building was to be erected, it will be necessary to obtain the sanction of the donors for the fund to be applied to the alterations, but there is no reason to anticipate any difficulty on this score. As to the terms of the transfer, there does not appear to be anything to which exception could be taken on any ground. Beyond the deficit above-mentioned our liabilities are confined to a small compensation to one of the art masters, and the retention of the present curator, whose services will no doubt be of great value to us. The opening of the museum to the public can, it seems to me, only result in benefit to the Association, as it will tend to make it more widely known and appreciated. We undertake no responsibility which the present Council of the museum have not borne since its institution, and the possession of the collection of casts will be of the greatest value in our educational work. In conclusion, I think I have stated the case in its various aspects as fairly as possible, and it seems to me personally, as it has to the committee without exception, that the gift of these premises is the most fortunate circumstance which has occurred to the Association during the course of its long history, and I trust it will prove to be the starting-point for a widely extended sphere of increased usefulness.

I beg now formally to propose that the Architectural Association take over the premises and equipment of the Royal Architectural Museum and Westminster School of Art on March 25, 1903, and accept the conditions named by the Council of the museum, and agreed between the respective solicitors.

The PRESIDENT read several letters from members who, unable to be present, desired to express their confidence in the committee and to support the proposal.

Mr. L. AMBLER formally seconded the President's proposal.

Mr. W. H. SETH-SMITH, who supported the resolution, called attention to the admirable way in which Mr. Maurice B. Adams had brought the negotiations to a successful issue. For thirty years he had held to the Westminster Museum with the faith and enthusiasm of a devotee, and with the prescience of a prophet. He foresaw apparently that the profession would require the collection of casts at some time for the education of young architects, and now that time had arrived. The museum and Westminster School had grouped around them a series of classrooms of the very best type. The main purpose of this building had been to preserve the museum for the architectural profession, and it therefore seemed a legitimate termination for such a school to be taken over by a representative body. Although they might feel that some of the staff of the school could reasonably have hoped to continue their work in spite of the transfer, such an arrangement had been thought impracticable, and the committee had acted as generously as was within their power. Although the future looked full of promise in view of the fact that they were getting these premises as a gift, and that the yearly rental would be lower than that of the premises in Great Marlborough Street, the committee were aware that in the new undertaking the work of the Association could not be properly done at a less expenditure than hitherto.

Mr. MAURICE B. ADAMS said he attended the meeting rather as a listener than as a speaker, but the President had suggested that he should make a few remarks. He said he had never thought that the Association would be able to do in his lifetime what they were proposing to do. He always believed that a change of taste would bring the collection in Tufon Street more into favour and result in the specimens and casts being treasured as examples of English architecture. He did not think there would be a revolution in their work because the Architectural Association had come into possession of the museum. The casts were more like the dry bones of the art, and their value would only be realised when they were brought before students by a capable teacher. No better use, however, could be made of the collection than was proposed. With regard to the transfer of the premises, the speaker said the occasion was a most pleasing one to him. The matter had given general satisfaction, and everybody had co-operated and given aid absolutely for the good of the profession. He did not wish to take the credit of this to himself, for without the assistance of the Council of the museum nothing could have been done.

The other speakers who supported the proposal were

Messrs. F. T. Baggallay, C. F. Hayward, Owen Fleming, E. O. Sachs, T. Blashill, F. N. Reckitt, F. Hooper, H. Satchell, T. H. Watson, Max Clarke, F. Lishman, W. H. White, R. P. Jones, E. Swinfen Harris and Cole A. Adams.

The PRESIDENT said there had been no difference of opinion among the speakers. He quite agreed as to the desirability of retaining the present school of art, but it did not seem possible for the Association to carry out such an undertaking at the present time. The insurance of the lease was under the consideration of the committee. Turning to the financial side, he was quite sure they had no more funds than they would require, and he expressed the hope that all those members who were able to, and who had not subscribed would see their way to do so.

The proposal being put to the meeting was carried unanimously.

The PRESIDENT in conclusion, on behalf of the Association, moved a hearty vote of thanks to the Council of the Architectural Museum for their gift, and particularly to Mr. Adams, for the initiation of the idea. The thanks of the Association were also equally due to Mr. H. Seth-Smith for the part he had taken in the matter and for having started the Premises Fund. It was the subscriptions to this fund which enabled them to take advantage of the generous offer made by the Council of the museum. The total subscriptions towards the new premises scheme amounted to 4,320 $\frac{1}{2}$ l., but they hoped for further additions.

## LEEDS AND YORKSHIRE ARCHITECTURAL SOCIETY.

THE first of a series of "Craft Evenings," inaugurated by the above Society, was held on the 20th inst., the president (Mr. Butler Wilson) in the chair. Mr. John Wright, of the Royal Painter Etchers' Society, discoursed to the members and their friends on "The Evolution of an Etching." The various processes of etching, aquatint, mezzotint and dry-point were also explained, whilst the making of an etching from its commencement to the completed print was practically demonstrated. Mr. Wright's illustration was followed with great interest, and the attractiveness of his subject was evidenced by the large number of members present.

## ARCHITECT'S FEES.

IN the King's Bench Division of the High Court of Justice on Monday the case of Owen and Another v. Davison, which came before Mr. Justice Ridley and a common jury, was an action by Mr. S. Owen and Mr. George Frederick Ward, architects and surveyors, of 71 Colmore Row, Birmingham, to recover from Mr. Arthur William Davison, a licensed victualler, of the William IV. inn, Camberwell, London, 161 $\frac{1}{2}$ l. commission and expenses for preparing plans for the erection of an hotel at Benfleet, Essex. The plaintiff's case was that instructions were given to Mr. Ward, a member of the plaintiff's firm, by the defendant, in June 1901, when the site of an hotel proposed to be erected at Benfleet was visited. The plaintiffs prepared the plans of an hotel estimated to cost 7,000 $\frac{1}{2}$ l., and charged the defendants 2 per cent. The charge authorised by the Institute of British Architects was 2 $\frac{1}{2}$  per cent., but, as specifications were not prepared, plaintiffs made a reduction of  $\frac{1}{2}$  per cent. The remainder of the sum sought to be recovered was charged for expenses in visiting the site of the proposed hotel and other incidental expenses. The plans were sent to the defendant, who approved of them and returned them with a letter of approval. The defendant's case was that he met a man named Bell who proposed to form a syndicate to erect and finance the hotel, the defendant to procure a license and to undertake the management for one year. Mr. Ward, he said, agreed with the scheme, and defendant understood that the plaintiff firm were to go shares in the profits of the sale of the hotel after it had been fairly set afloat. The defendant never gave any orders on his own account to the plaintiffs. He understood that he was merely a member of a syndicate or partnership who were to share and share alike in the profits of the scheme, to which he was to contribute the site of the hotel and his personal services as manager. The scheme, however, fell through owing to the failure to obtain a license, the local authority requiring an old license to be surrendered in return for the new license. The defendant further stated that he gave up in favour of this scheme a scheme of his own to erect an hotel on the same site, at a cost of 800 $\frac{1}{2}$ l., which was all the outlay he could afford without being financed. The plaintiffs, in reply, denied that Bell was an agent of the firm, or that there was any understanding whatever as to a partnership or syndicate, or that plaintiffs were to finance the scheme. The plaintiffs (Mr. Ward and Mr. Owen) and the defendant gave evidence in support of their different views of the



transaction in dispute, but Bell, the supposed agent, was not called, it appearing that neither side had been able to secure his attendance. The case therefore depended upon the evidence of Mr. Ward and the defendant, which was contradictory, and the jury, it appeared, found it very difficult to decide between them. They commenced the consideration of the case at 1.30 P.M., and after half an hour's deliberation without arriving at a decision were locked up, and did not return into Court till a few minutes to four o'clock, when they gave a verdict for the defendant. In the meantime Mr. Justice Ridley had left the court, and judgment was consequently not entered.

#### MANCHESTER INFIRMARY.

THE first ordinary meeting of the new Board of Management of the Manchester Royal Infirmary was held on Monday in the infirmary board-room. Mr. John Thomson, chairman of the Board, presided.

It was mentioned in the minutes that a bill for £1,898½ presented by Messrs. Simpson & Milner Allen, architects, had been passed, and that the firm had been informed that all questions of fresh plans and building an infirmary on another site would rest with the new Board.

The Chairman said it seemed to him that it would be necessary to ascertain the nature of the offer of an infirmary site in Stanley Grove. He did not propose to interfere with the work of the committee, to which he would refer presently, but he thought it was essential that a letter should be obtained from the Owens College Council making a distinct offer, with any conditions there might be, and enclosing plans of the land which the Council were in a position to offer. The committee which it was proposed to appoint would not be able to make any progress until they had received such a letter.

The Chairman was authorised by the Board to write to the Council of the College on the matter.

The Chairman then proposed that the Board should have a special meeting to appoint one or two committees, as might be thought best, to deal with the acquisition of the new infirmary site and with the sale of the site of the existing infirmary and other important matters, and to have power to engage such legal assistance as might appear desirable.

Mr. Milne expressed the hope that the proceeding with the new infirmary would not be allowed to depend upon the Board's getting rid of the old site.

The Chairman agreed, but said it was necessary to ascertain what restrictions there were, if any, on the old site, so that the Board might know what their asset was.

It was resolved that the Board should meet on Monday next to appoint the committees suggested by the Chairman.

#### TESSERÆ.

##### Moorish Work in Spain.

IN Spain the Arab conquerors first adopted the Roman architecture prevailing in the country, but soon introduced forms familiar to them in the earlier seats of Islam. Thus the great Mosque at Cordoba, built about the end of the eighth century, was at first an eleven-aisled basilica, resembling the Mosque of Al Aksa at Jerusalem, but subsequently lost its original character by additions and modifications in a purer Mohammedan style. Other mosques preserved more closely the form of the Christian basilica, as, for instance, that converted into the church of Sta Maria de Blanca at Toledo. The Moorish architecture of Spain, however, gradually lost the traces of its Romanesque origin. Form was soon sacrificed to decoration, stone and marble gave way to more perishable and less costly materials. The Mussulman taste for ornamentation was displayed in an infinite variety of elaborate and elegant stucco mouldings painted in every colour, in stalactitic ceilings, rare woods and gilded columns. Of the great Palace of Zahra, celebrated in Moorish story, with its 4,300 columns of precious marbles, its painted walls, its roofs of cedar and its gold and azure ceilings, not even a trace now remains. The more humble Alhambra, built of less costly and more perishable materials, with its gardened courts and pleasant fountains, has been more fortunate, and has remained to us as the type of Moorish architecture. It shows the same sensuous enjoyment of life, the same luxurious delight in flowers and running waters that distinguish Mohammedan architecture in all parts of the world. But the Moslems of Spain seem to have almost foreseen the shortness of their tenure and the remorseless persecution which would destroy the very traces of their hated race and creed. They left no such monuments as the mosques of Egypt or the massive edifices of the Pathans of India. It is remarkable, too, that unlike other Mohammedan nations, they raised no time-defying tombs over their illustrious dead. The entire absence of monuments of this nature induces Fergusson to conjecture that there was no mixture of Tartar blood in their

veins. Whether this be so or not, it does seem probable that this absence of sepulchral edifices deprived them of one of the most attractive features of Mohammedan architecture—the dome.

#### John Bacon the Sculptor.

To rebuke the eternal sarcasms about his ignorance of the antique because he had never studied in Rome, Bacon modelled a head of Jupiter Tonans, gave it the exterior aspect of time, and produced it amongst the connoisseurs, who, with one voice, inquired from what temple it had been brought. He often remarked on the affectation of many with respect to the antique, who are without taste for selecting what is really excellent in it. "Call it," said he, "but an antique, and people begin immediately to find some beauty. Look at that figure in the corner of my study, can you see anything in it? Yet many who come here and at first take no notice of it, as soon as they hear it is a cast from the antique, begin to admire. Had I made it a few years ago it would not have produced me a shilling." He found, however, some consolation in contemplating other sources beside the antique for inspiration. "I cannot grasp," he once said, "much less arrange at one time, several ideas. If I have anything distinguishing, it is a knack at expressing an idea single and detached; I stick to my mistress Nature, and she often lends me her hand." "He knew," said one of his sons, "where his forte lay. I have heard him often compare himself to the cat in the fable, that had but one sure trick by which to save herself. He used continually to inculcate the importance of a man's attending to that one point in which he discovered his chief talent to lie, and mentioned himself as an instance of the success attending this principle." When captious remarks concerning the antique assailed him, he consoled himself with the idea that he saw art through nature, and that he approached the dignity of ancient sculpture by the same road which Phidias had walked before him. The boasted antique, he said, was found where he himself was seeking beauty and grace, and that the finest of all those wondrous statues of old was but the result of poetry acting upon the actual form and mind of man. Banks was one of those who taxed Bacon's works with the want of antique feeling; neither in his Mars, his Venus, nor his Narcissus, a soft and graceful figure, would the brother sculptor allow the presence of poetic thought. Flaxman, too, concurred with Banks, and Bacon had little consolation save in his own good opinion of his works, supported by the almost general voice of the country. This indeed was most intelligibly expressed; his studios were filled with commissions, his banker respected him for the weight of his deposits; his name began to be coupled with that of Nollekens among the moneyers on Change, and the India Company seeing his shares in their stock increase, thought that a sculptor who was at once eminent in art and strong in Eastern interest might be employed in recording in marble the actions of their heroes. It was probably his increasing importance which brought on those fits of humility to which Cecil says he was liable. "We are all beggars at the best," said the moralising sculptor, "but we are ready to forget it, and that is one source of our pride. Two beggars stand at a door, the one receives a penny, the other a guinea; it is well if the latter does not begin to imagine reason for the distinction; it is well if he does not swell upon it and turn in contempt upon his fellow. Yet this is but a picture of a man's admiration of his gifts." This suspicious and sordid view of human nature made Bacon, as it well might, fearful of his fortune, and induced him to set a guard upon his feelings and receive with gladness the admonitions of his friends. Whatever might be the moral inferences which he drew from an increase of wealth, it is quite certain that his talent in acquiring it was strengthening, that he had the art of keeping it well together, and surpassed many who thought themselves clever in the way of laying it out to advantage.

#### St. Paul's Cathedral.

Buried amidst a thick-piled city—hampered as its architect had felt himself in planning the western front to suit that narrow aperture called Ludgate Hill—composed as it is of freestone and not of marble, and stained with all the impurities of sea-coal smoke, St. Paul's never fails to fill the mind of the commonest beholder with admiration at its exquisite unity and varied and boundless magnificence. To construct a small work, pleasing at once from its beauty and neatness, is something; but to conceive and unite the many distant and distinct parts of such an immense pile as this into one complete whole, tying them elegantly together with that magic band which is at once their ornament and security, like the sculptured keystone of a triumphal arch, requires a master spirit. There is perhaps no one part of the existing cathedral that equals the celebrated Corinthian portico of Inigo Jones; the merit or Wren lay in observing the proprieties of art—he has few bold masterly hits, few unlooked-for beauties; there is no little space in the pile on which he has, as it were, condensed his strength; his glory lies in the entire structure, in his unrivalled skill



balancing and combining all the members of his edifice into one consistent and harmonious whole. This is to have in architecture a genius of the epic order. "A variety of knowledge," says Walpole, "proclaims the universality, a multiplicity of works the abundance, St. Paul's the greatness, of Sir Christopher's mind. Our noblest temple (St. Paul's), our largest palace (Hampton Court), our most sumptuous hospital (Greenwich), are all works of the same hand." Foreign censure as well as native praise has been exhausted on St. Paul's.

#### Mohammedan Domed Tombs.

The usual process for the erection of these structures is for the king or noble who intends to provide himself a tomb to enclose a garden outside the city walls, generally with high crenellated walls and with one or more splendid gateways, and in the centre of this he erects a square or octagonal building crowned by a dome. This building is generally situated on a lofty square terrace, from which radiate four broad alleys, generally with marble-paved courts ornamented with fountains; the angular spaces are planted with cypresses and other ever-green and fruit trees, making up one of those formal, though beautiful, gardens so characteristic of the East. During the lifetime of the founder the central building is called a Barrah Durrie, or festal hall, and is so used as a place of recreation and feasting by him and his friends. At his death its destination is changed; the founder's remains are interred beneath the central dome. Sometimes his favourite wife lies beside him, but more generally his family and relatives are buried beneath the collateral domes. When once used as a place of burial its vaults never again resound with festive sounds. Perfect silence now takes the place of festivity and mirth. The beauty of the surrounding objects combines with the repose of the place to produce an effect as graceful as it is solemn and appropriate.

#### Pliny on Ancient Art.

The "Natural History" of Pliny is certainly a most interesting, amusing, and in many respects valuable book, but quite as certainly it is one of the most inaccurate that ever was written, abounding in half-knowledge, second-hand information, legendary statements and rubbish of every kind. It is, in a word, the commonplace book of an agreeable, gossiping man, of a wide reading, who took little pains to be accurate, who reported everything he heard with slight examination, who was exceedingly credulous, and who accepted as truth and fact the most ridiculous stories. All is fish that comes to his net. In his chapters relating to artists and art he is singularly devoid of judgment or accurate knowledge; he constantly confuses things together which have no relation to each other, often contradicts himself and becomes at times utterly unintelligible. Yet we are forced to turn to Pliny to give a weight and authority to his words upon art, and to own a deep debt of gratitude to him—not because he is trustworthy, but simply because he alone of all the ancient authors, with the exception of Pausanias, has given us a detailed account of the statues and artists of antiquity. His account of the ancient artists and their works is the fullest we have, and adrift as we often are in a wide sea of conjecture, we are glad to seize upon any straws and fragments "rari nantes in gurgite vasto" of blankness and doubt; seizing here a bit from Pausanias, Herodotus or Lucian, there a waif from Cicero, or a floating fragment from one of the great tragic poets, and glad enough to get upon any such raft as that which Pliny gives us, however leaky and rickety. But seaworthy or trustworthy in emergencies Pliny certainly is not.

#### Nero's "Golden House."

Suetonius gives some curious details of this enormous edifice. In the vestibule stood a colossal statue of Nero 120 feet in height; there were three porticoes, each a mile in length, and supported by three rows of pillars; the garden seems to have resembled a park, and contained an immense piece of water, woods, vineyards and pasture ground, herds, and even wild beasts. On the banks of the lake rose various edifices that resembled towns. In the palace itself the rooms were lined with gold, gems and mother of pearl. The ceilings of the dining-rooms were adorned with ivory panels, so contrived as to scatter flowers and shower perfumes on the guests. The principal banqueting-room revolved upon itself, representing the motions of the heavens; the baths were supplied with salt water from the sea, and mineral water from the Albula, now Solfatara, near Tibur. The buildings of Nero were more destructive, adds Suetonius, to the empire than all his other follies. Cicero had passed a still more severe judgment upon excess. He held no expenses to be really laudable but such as had the public utility in view; as the walls of cities and citadels, arsenals, ports, aqueducts, causeways and others of a like nature. He carried his rigour so far as to condemn theatres, piazzas and even new temples, and supported his opinion by the authority of Demetrius Phalereus, who absolutely condemned the excessive expenses of Pericles in such structures.

Cicero makes different reflections upon the buildings of private persons; for there is certainly a difference to be made in this point, as well as all others, in regard to princes. He is for having persons in the first rank in the state lodged in an honourable manner, and that they should support their dignity by their habitations; but at the same time that their houses should not be their principal merit, and that the master should do honour to the dwelling, and not the dwelling to the master. He recommends to the great men that build, carefully to avoid the excessive expenses incurred by the magnificence of structures, expenses which become of fatal and contagious example to a city; the generality not failing, and making it a merit, to imitate and sometimes even to exceed the great. Palaces thus multiplied are said to do honour to a city. They rather dishonour it, because they corrupt it by rendering luxury and pomp continually necessary, by the costliness of furniture, and the other expensive ornaments required in lofty buildings, which are, besides, often the cause of the ruin of families.

#### GENERAL.

**M. Marcheix** has been appointed a conservator of the Ecole des Beaux-Arts, in succession to the late Eugène Müntz.

The "Cat and Mutton Bridge" over the Regent's Canal is to be reconstructed by the London County Council. The estimated cost of the improvement is 71,800*l*. Bow Bridge is likewise to be reconstructed.

The Bridges Committee, to whom the Oxfordshire County Council delegated powers of settling the design for the Sonning bridges, have decided to carry out the original plans of the architect with lattice girder parapets supported on iron piles, with spans of 50 feet width, and not to incur the additional cost which would have been involved in dispensing with lattice parapets and building brick piers as supports, with less width of span.

**M. Paul Besnard**, the French painter, has received the dignity of a commandership of the order of St. Maurice and St. Lazare, in recognition of his services as president of the exhibition of decorative art in Turin.

The Municipal Council of Paris have arranged to borrow 45,000,000 francs, which will be expended on the improvement of the hospital buildings of the city.

**Mr. Norton P. Otis**, chairman of the Board of Directors of the Otis Elevator Company, has been elected to Congress from the 19th Congressional district, New York.

A Congress of French contractors for buildings and public work has been held this week in Paris.

The Jurors selected by the exhibitors of signboards who will represent artists and manufacturers are MM. Grasset, Jambon, Lalique, Alexandre Charpentier and Frantz Jourdain, architect. The supplementary jurors are MM. Jules Chéret and Binet.

The Rectory House of Pakefield, near Lowestoft, has been rendered uninhabitable by the encroachments of the sea on the Suffolk coast. The lawn, on which the Pakefield "conventions" used to be held, has already been washed away. The Ecclesiastical Commissioners have promised 700*l*. towards a new house if a similar sum is raised by December 1.

**Mr. Batsford** is preparing for publication a folio work on "Old Silver, chiefly English, from the Fifteenth to the Eighteenth Centuries," with notes by Mr. J. S. Gardner, F.S.A. It will contain 120 plates. A part of the payment for each copy will be given in aid of the Children's Hospital.

The Institution of Civil Engineers will hold an ordinary meeting on Tuesday next, December 2, at 8 P.M., when the paper to be submitted for discussion will be on "High-speed Electrical Generating Plant," by Mr. Thomas Herbert Minshall.

The next Ordinary Meeting of the Society of Engineers will be held on Monday next, December 1, at the Royal United Service Institution, Whitehall, when a paper will be read entitled "Depreciation of Plant and Works under Municipal and Company Management," by Mr. Charles H. W. Biggs.

**Mr. Akers Douglas**, Home Secretary and formerly First Commissioner of Works, has been appointed an Ecclesiastical Commissioner.

The Design by Mr. Boscombe John, A.R.A., has been adopted for the memorial of the men of the Liverpool Regiment who fell in South Africa which is to be erected in Liverpool.

**Dr. Goegg**, professor of technology in Geneva, read a paper before the Society of Arts on Wednesday on the Simplon Tunnel.

**Mrs. Baxter**, who was more generally known as "Leader Scott," and was author of several valuable books on Italian art, has died in Florence. She was the daughter of the Rev. William Barnes, the Dorsetshire poet and philologist.



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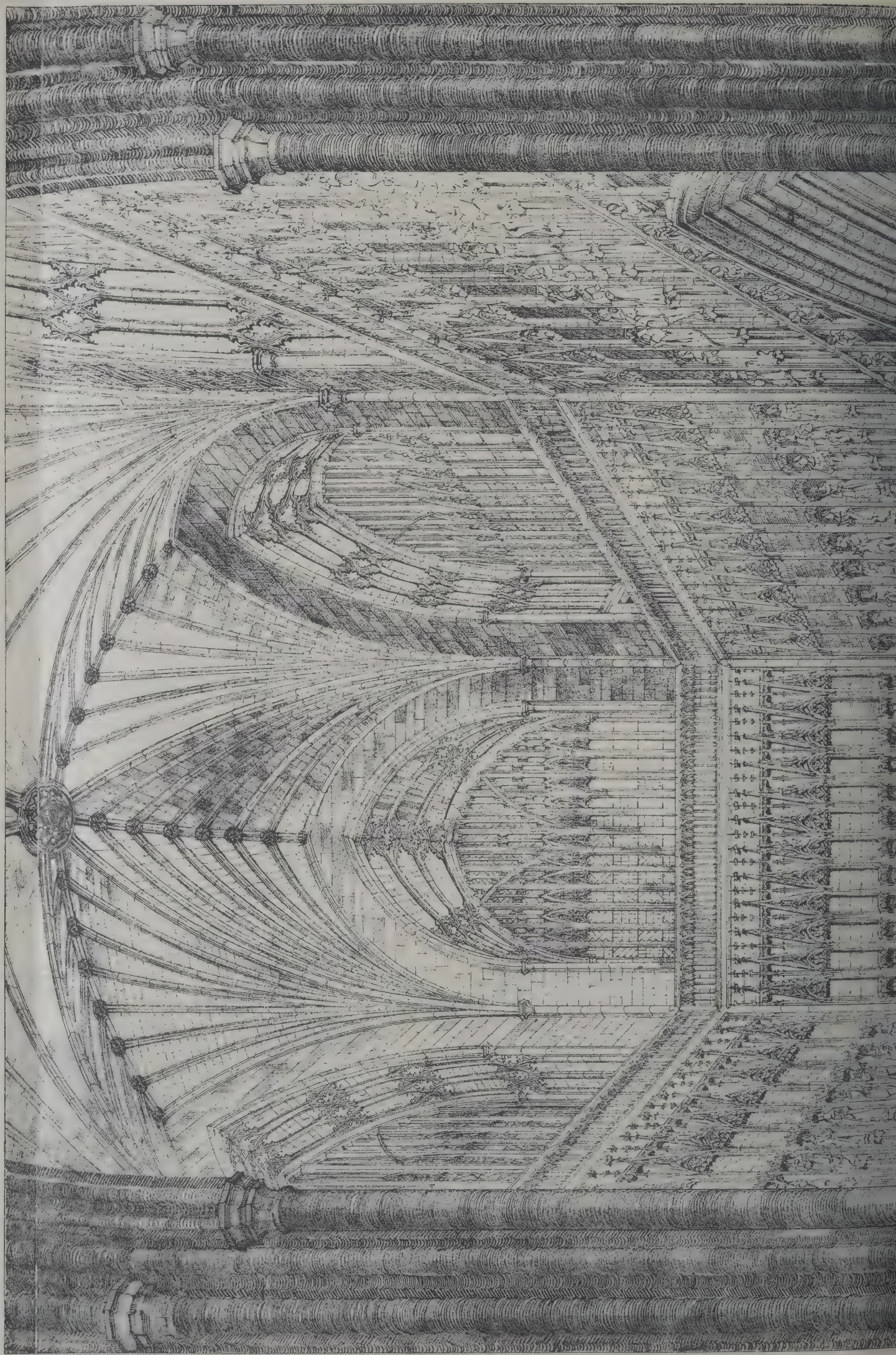
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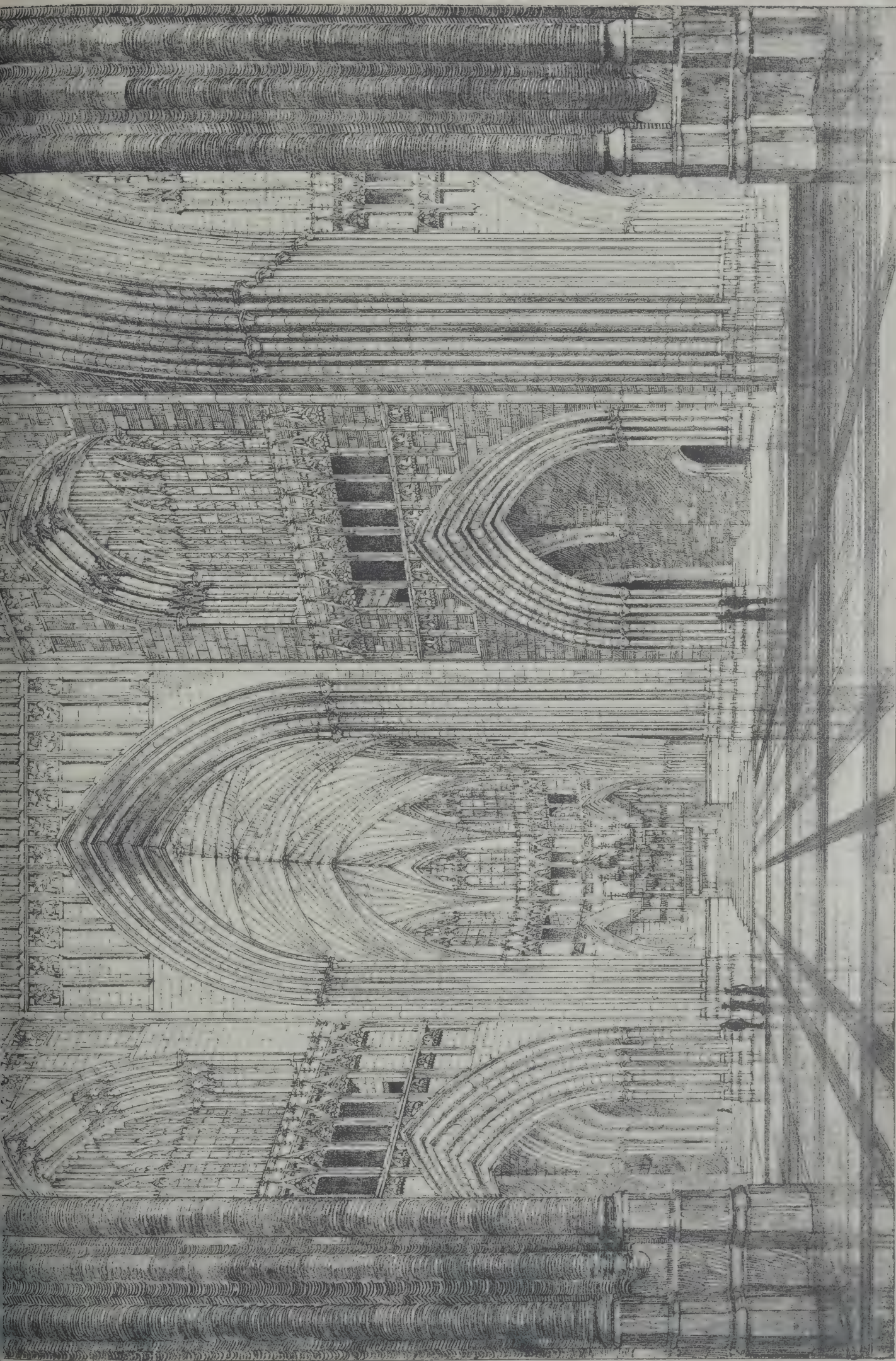


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INTERIOR VIEW LOOKING EAST, SHOWING CENTRAL OCTAGON.



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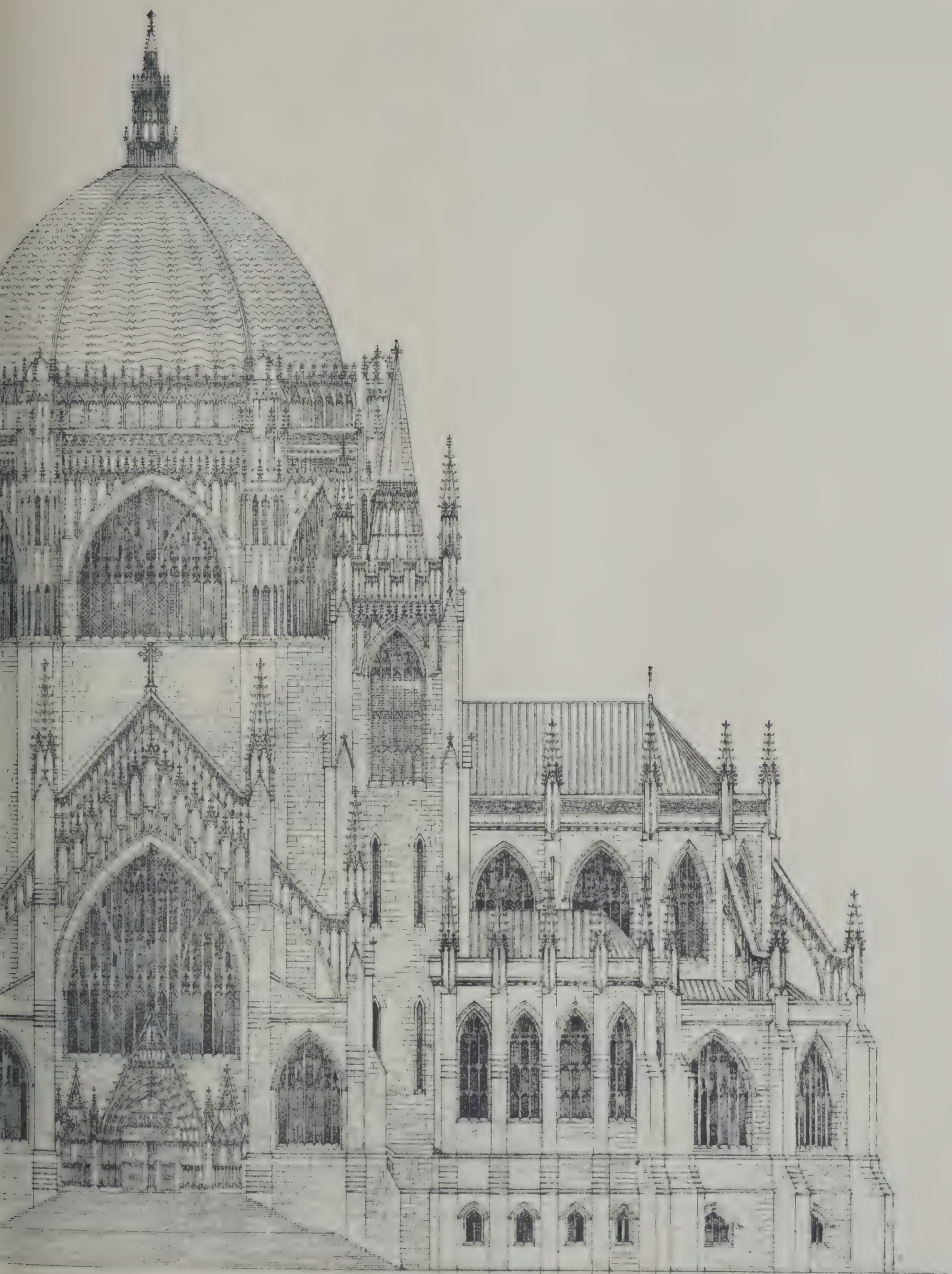


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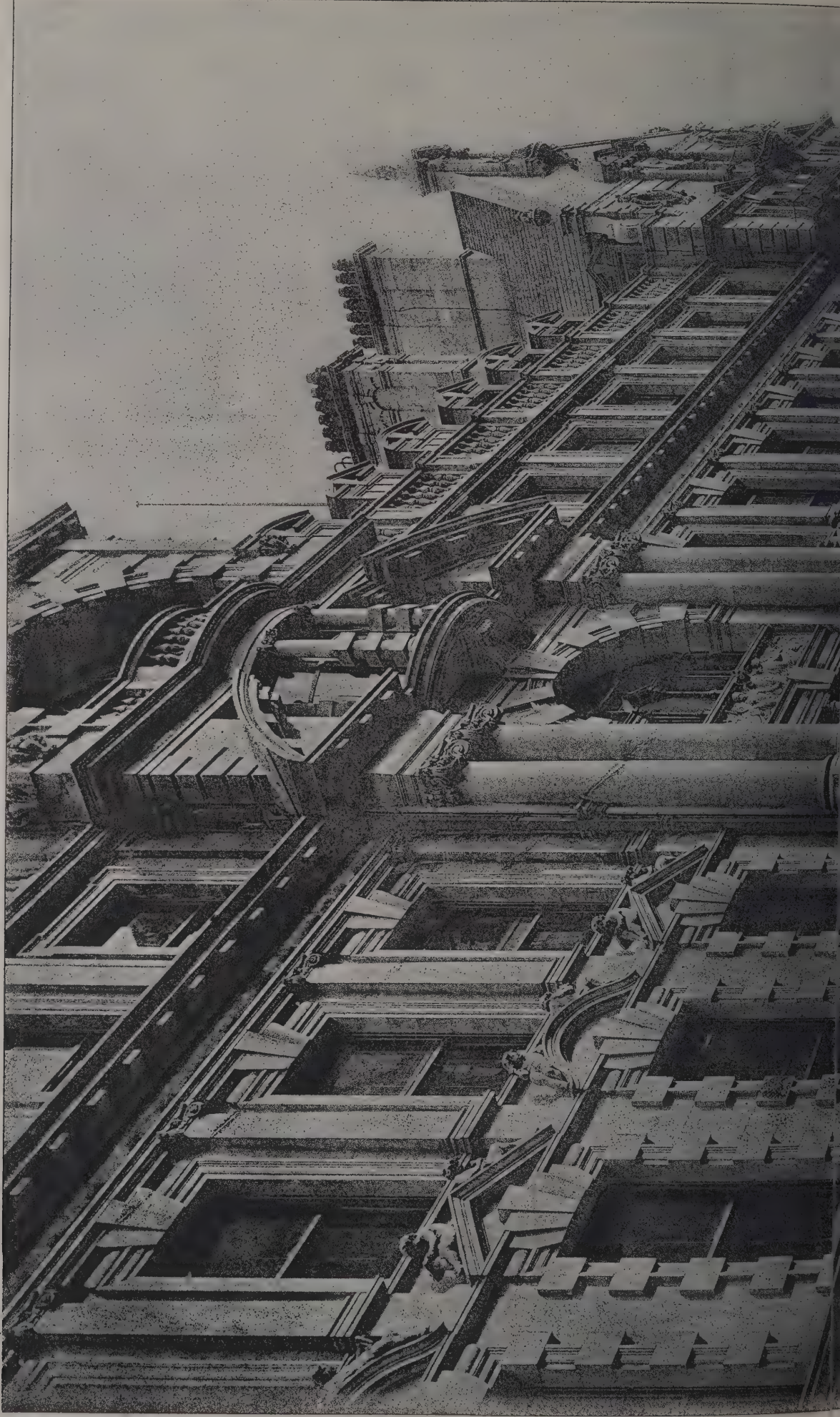




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The Architect, Nov 28<sup>th</sup> 1902.







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THE

## Architect and Contract Reporter.

## EDITORIAL NOTICES.

*In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

## TENDERS, ETC.

*\*\* As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

## COMPETITIONS OPEN.

ASHTON-IN-MAKERFIELD.—Dec. 31.—Designs, &c., are invited for the enlargement of the Infectious Diseases Hospital. The architect whose plans are accepted and approved will be retained by the Council to carry out the work at the usual professional charges. Plan of the hospital site, together with full particulars of the alterations and extensions required, may be obtained from Mr. T. Burgess, surveyor, at the Council Offices.

BRIDGWATER.—Feb. 28.—Plans, specifications and estimates are invited in competition for power and appliances to deal with the accumulations of silt in portions of the river Parrett. Mr. W. T. Baker, town clerk, King Square, Bridgwater.

CAPE TOWN.—Jan. 31.—The Council of the University of the Cape of Good Hope invite designs for the erection of university buildings. Premiums of 400*l.*, 200*l.* and 100*l.* will be awarded to the authors of the designs placed first, second and third respectively. Particulars of the competition may be obtained on application to the Registrar at Cape Town, or to the Agent-General in London.

DURBAN (NATAL).—Dec. 18.—Design are invited for new town hall, library, museum, art gallery and municipal offices. Three premiums of 500*l.*, 300*l.* and 200*l.* respectively will be awarded for the three best designs in order of merit. Mr. W. H. Radford, C.E., Albion Chambers, Nottingham.

ECCLES.—Dec. 12.—Plans are invited for the laying-out of an area of land and for erection of dwellings for the working-class on part of such area. Premiums of 50*l.*, 30*l.* and 15*l.* will be awarded in respect of the plans placed first, second and third in order of merit. Mr. Wm. Henry Hickson, town clerk, Town Hall, Eccles.

HOLYHEAD.—Dec. 2.—Sketch designs are invited for schools and a teacher's house. The competitor whose designs and terms are approved and accepted by the Board will be appointed the architect. Mr. R. E. Pritchard, clerk, Holyhead.

HULL.—Jan. 31.—Designs in competition are invited for the extension of the town hall. Premiums of 300*l.*, 200*l.* and 100*l.* are offered. Mr. E. Laverack, town clerk, Town Hall, Hull.

KINGSTON-ON-THAMES.—Jan. 15.—Plans and designs are invited for a central home and cottage homes for children of both sexes in the Kingston Road, in the parish of New Malden. A premium for the first three selected plans of 25*l.*, 15*l.* and 10*l.* respectively is offered. Mr. Jas. Edgell, clerk, Union Offices, Coombe Lane, Kingston-on-Thames.

SURBITON.—Dec. 16.—Designs are invited for erection of a Coronation memorial clock tower near the refuge in the area fronting Surbiton station. Premium 10*l.* 10*s.* Dr. Coleman, chairman, clock committee, District Council Offices, Surbiton.

## CONTRACTS OPEN.

ACCRINGTON.—Dec. 13.—For erection of a parish-room at St. John's Church, Accrington. Mr. Henry Ross, 15 Cannon Street, Accrington.

AMSTERDAM.—Dec. 3.—For supply of—Contract No. 319—Corrugated and flat galvanised iron (soft steel) with appurtenances. Contract No. 70.—Asphalted cast-iron pipes with appurtenances. Contract No. 71.—Corrugated galvanised iron with appurtenances. Contract No. C8.—Galvanised iron (soft steel). Contract No. D8.—Corrugated and flat galvanised iron plating and roofing. Contract No. E8.—Zincd iron wire. Contract No. F8.—Soft steel. Contract No. H8.—Sundry plates, discs, &c. Contract No. 18.—Light rails and chairs with bolts and sleepers. Particulars may be obtained from the firm of Mart. Nyhoff at The Hague.

AUSTRALIA.—Dec. 22.—For erection at Perth, Australia, of a rubbish destructor capable of dealing with forty tons of garbage in eight hours. Mr. W. E. Bold, town clerk, Town Hall, Perth.

BARKISLAND.—Dec. 2.—For erection of a road-roller shed, Barkisland. Mr. R. Clements, surveyor to the Urban District Council.

BARNACK.—Dec. 6.—For erection of walling, wrought-iron fencing and gates, enclosing the new cemetery at Barnack, Northamptonshire. Mr. J. B. Corby, architect, 15 All Saints Place, Stamford.

BEXLEY HEATH.—Dec. 8.—For erection of car-shed buildings. Mr. T. G. Baynes, clerk, Urban District Council, Public Hall, Bexley Heath, Kent.

BRADFORD.—For alterations and additions to Cambridge House, Little Horton Lane, Bradford. Mr. Edgar H. Parkinson, architect, Old Bank Chambers, Bradford.

BRADFORD.—For completion of the unfinished portion of the buildings in connection with the Empire Boiler Works. Mr. J. B. Childe, Prudential Buildings, Bradford.

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Fig. 1.



**BURY (LANCS).—Dec. 13.**—For erection of (1) brickwork for walls, arches and chimneys for six through beds of retorts; (2) ironwork for ditto, with stage flooring; and (3) coke storage hoppers at the gasworks. Mr. H. Simmonds, general manager, Gasworks, Elton.

**COLCHESTER.—Dec. 5.**—For erection of nurses' quarters at the workhouse. Messrs. Goodey & Cressall, architects, Victoria Chambers, Colchester.

**CONSETT.**—For erection of a dwelling-house, &c., at Medomsley Road, Consett, Durham. Mr. Ward, 47 Sherburn Terrace, Consett.

**CROYDON.—Dec. 8.**—For extension of the car-shed at the Brighton Road (Purley) depôt. Mr. E. Mawdesley, town clerk, Town Hall, Croydon.

**DEPTFORD.—Dec. 9.**—For an addition to the Council's laundry at the public baths and washhouses, Laurie Grove, New Cross Road, S.E. Particulars can be obtained on application at the Borough Surveyor's Office, 493 New Cross Road, S.E.

**DEVONPORT.—Dec. 2.**—For erection of a special school, Exmouth Road, Stoke. Messrs. Hine & Odgers, architects, Lockyer Street, Plymouth.

**DIDCOT.—Dec. 1.**—For alterations and additions to the Board school at Didcot. Messrs. Hoare & Wheeler, architects, 17 Friar Street, Reading.

**EVERSLEY.—Dec. 1.**—For removal of brick parapets and arches and preparing substructure for steel platform to Eversley Bridge, Hants. Mr. W. J. Taylor, county surveyor, The Castle, Winchester.

**FELIXSTOWE.—Dec. 1.**—For erection of a fire station. Mr. F. B. Jennings, Town Hall, Felixstowe.

**FINCHLEY.—Dec. 1.**—For fitting-up a chemical and physical laboratory, science lecture-room, preparation-room, &c., at Christ's College. Mr. E. H. Lister, clerk, Council Offices, Finchley Hall, Finchley, N.

**GLOUCESTER.—Dec. 20.**—For alterations and additions to the Tuffley Board school, Gloucester. Mr. Walter B. Wood, architect, 12 Queen Street, Gloucester.

**GREAT YARMOUTH.—Dec. 9.**—For erection of proposed girls' home at the Hollies, Gorleston. Mr. Walter Lake, architect, Regent Street, Great Yarmouth.

**HALIFAX.—Dec. 6.**—For erection of a pair of dwelling-houses on the Albert Promenade. Mr. Lister Coates, architect, Yorkshire Bank Chambers, Waterhouse Street, Halifax.

**HALIFAX.—Dec. 15.**—For erection of an extensive block of high-class shops, showrooms, workrooms, &c., in Commercial Street, Halifax. Mr. W. Clement Williams, architect, 29 Southgate, Halifax.

**ILKLEY.—Dec. 11.**—For erection of a house at Ilkley. Mr. W. H. Herbert Marten, architect, Cheapside Chambers, Bradford.

**IRELAND.—Dec. 1.**—For erection of bank premises at Kilkenny, for the Hibernian Bank, Ltd. Messrs. William H. Byrne & Son, architects, 20 Suffolk Street, Dublin.

**IRELAND.—Dec. 1.**—For erection of the Rev. Br. Burke Jubilee memorial, Our Lady's Mount, Cork. Mr. Saml. F. Hynes, architect, 21 South Mall, Cork.

**IRELAND.—Dec. 1.**—For erection of a church, Aughnacloy, co. Tyrone. Messrs. Doolin, Butler & Donnelly, architects, Dawson Chambers, Dublin.

**IRELAND.—Dec. 2.**—For erection of an ornamental wooden shelter in the Esplanade, Bangor, co. Down. Mr. James Milliken, clerk, Town Hall, Bangor, co. Down.

**IRELAND.—Dec. 2.**—For erection of cottages in various townlands for the Strabane Rural District Council. Mr. J. E. Sharkie, clerk, Strabane.

**IRELAND.—Dec. 6.**—For alterations to Castledawson Presbyterian church, Belfast. Mr. Thomas Houston, architect, Kingscourt, Wellington Place, Belfast.

**IRELAND.—Dec. 13.**—For erection of an auxiliary dispensary depôt at Carrigeens, in the Carney dispensary district of Sligo. Mr. P. J. Kilgallen, architect, Abbeyville, Sligo.

**ISLE OF WIGHT.—Dec. 9.**—For erection of a chimney-shaft at the Cowes waterworks pumping station. Mr. H. C. Damant, clerk, U.D.C., High Street, Cowes.

**KING'S LYNN.**—For alterations to house, Railway Road, King's Lynn. Mr. Louis F. Eagleton, architect, King Street, King's Lynn.

**LAMBETH.—Dec. 10.**—For provision of a separate doorway and other work at the dispensary, 112 Westminster Bridge Road, S.E. Particulars may be obtained at the Guardians' Offices, Brook Street, Kennington Road, S.E.

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LAMBETH.—Dec. 10.—For erection of a pump-house at Renfrew Road workhouse. Mr. W. Thurnall, clerk to Guardians, Brook Street, Kennington.

LANCASTER.—Dec. 1.—For erection of a cricket pavilion on the Lune Road ground Mr. J. Parkinson, architect, 67 Church Street, Lancaster.

LEEDS.—For erection of six stone-built through houses at Slaidhill, Shadwell Lane, Leeds, with outbuildings, garden walls, &c. Mr. A. D. Kaye, architect, 98 Albion Street, Leeds.

LEWISHAM.—Dec. 2.—For construction of a brick and concrete wall (about 570 feet in length), with iron railing, &c., at Southend Village, Bromley Road, Catford. Particulars may be obtained at the office of the Borough Surveyor, Town Hall, Catford.

LONDON.—Dec. 1.—For fitting-up, &c., of a chemical and physical laboratory, science lecture-room, preparation-room and master's-room at the Christ's College, Finchley. Mr. E. H. Lister, clerk, Finchley Hall, Finchley, N.

LONDON.—Dec. 2.—For erection of stables near West Ealing, Middlesex, for the Great Western Railway Company. Mr. G. K. Mills, secretary, Paddington Station, London.

LONDON.—Dec. 3.—For erection of a receiving-home for children, and stabling, at the Tooting Bec Asylum, Tooting Bec Common, S.W. Messrs. A. & C. Harston, architects, 15 Leadenhall Street, E.C.

LONDON.—Dec. 11.—For erection of the superstructure of the Victoria and Albert Museum at South Kensington, for the Commissioners of H.M. Works and Public Buildings. All information may be obtained at H.M. Office of Works, Storey's Gate, Westminster, S.W.

MAIDENHEAD.—Dec. 2.—For erection of a house and an office at Maidenhead station, for the Great Western Railway Co. Mr. G. K. Mills, secretary, Paddington Station, W.

MARGATE.—Dec. 8.—For construction of a new engine and boiler-house, engineer's shop, office, weighbridge, stables, engineer's house and four cottages at Uffington, one mile from Adisham station, on the main line of the London, Chatham and Dover Railway. Mr. Edward Brooke, town clerk, 18 Cecil Square, Margate.

MELKSHAM.—Dec. 2.—For alterations and additions to the goods shed at Melksham, Wilts, for the Great Western Railway Co. Mr. G. K. Mills, secretary, Paddington Station, W.

NEWCASTLE-ON-TYNE.—Dec. 3.—For alterations and additions to business premises, New Bridge Street, Newcastle-on-Tyne, for the North-Eastern Railway Company. Mr. William Bell, architect, Central Station, Newcastle-on-Tyne.

PRESTON.—Dec. 6.—For alterations to the scarlet-fever block at the Preston and County of Lancaster Queen Victoria Royal Infirmary. Mr. Walter Davies, secretary, 5 Winckley Street, Preston.

PRESTON.—Dec. 11.—For erection of a hospital for infectious diseases, to contain twenty-six beds, at Fulwood, near Preston. Messrs. Seward & Rawcliffe, architects, 119A Fishergate, Preston.

RHODESIA.—Feb. 26.—For establishment and working of an electric tramway system, Bulawayo. Messrs. Davis & Soper, 54 St. Mary Axe, London, E.C.

ROTHERHAM.—Dec. 4.—For conversion of old mill, Treeton, into cottages. Mr. T. A. Brightmore, Treeton.

SCOTLAND.—Dec. 6.—For alterations and additions to St. Luke's Church, Cuminstown. Mr. Arthur Clyne, architect, 123½ Union Street, Aberdeen.

SHEERNESS.—Dec. 3.—For erection of a bakery at the Sheerness Economical Society's premises in Broad Street. Mr. John H. Burrows, secretary, 32 High Street, Sheerness.

SHEFFIELD.—Dec. 5.—For erection of buildings to the technical department of the University College in Charlotte Street and Broad Lane, Sheffield. Messrs. Gibbs & Flockton, architects, 15 St. James's Row, Sheffield.

SKELMERSDALE.—Dec. 9.—For erection of a church at Skelmersdale, near Ormskirk. Messrs. Austin & Paley, architects, Castle Park, Lancaster.

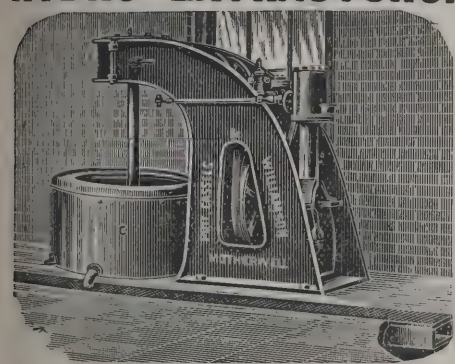
SLEAFORD.—Dec. 6.—For erection of schools at Sleaford, Lincs. Mr. Jesse Clare, architect, Sleaford.

SOUTHEND.—Dec. 2.—For erection of new Southchurch Hall schools for 1,280 children at Southend. Messrs. Burles & Harris, architects, Clarence Chambers, Southend.

STRATFORD-UPON-AVON.—Dec. 8.—For paperhanging and repairs at Wayfield House, Snitterfield. Mr. Roden Dixon, borough surveyor, Municipal Offices, Stratford-upon-Avon.

TROWBRIDGE.—Jan. 5.—For erection of an isolation hospital for thirty patients at Trowbridge, Wilts. Mr. J. Hugh Goodman, architect, Town Hall Chambers, Reading.

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**TUNBRIDGE WELLS**.—Dec. 1.—For alterations and additions to the accountant's offices at the town hall buildings. Mr. W. H. Maxwell, surveyor, Town Hall, Tunbridge Wells.

**UPHOLLAND**.—Dec. 1.—For construction of a covered service water reservoir, and the erection of an engine-house and workshop. Copies of specifications and forms of tender may be obtained from the Surveyor upon returnable deposit of one guinea.

**WALES**.—For erection of a vicarage at Ystradfellte. Mr. Glendinning Moxham, architect, 39 Castle Street, Swansea.

**WALES**.—For erection of four houses at Llangennech, alterations and outbuildings at Tyryn, Lanedy; alterations to Tyrfryn, Llannon; new road at Ystomenlle, Pontardulais; outbuildings at Cwmllethryd, Llanelly, and dwelling-house at Tyllwyd, Cross Hands. Messrs. J. Davies & Son, architects, Cowell House, Llanelly.

**WALES**.—Dec. 3.—For erection of a stable and coach-house at rear of Dynevor Arms, Tirphil. Mr. T. Roderick, architect, Glebeland, Merthyr Tydfil.

**WALES**.—Dec. 3.—For repairing, painting and papering the King's Head and Cambrian inn, Tredegar. Mr. T. Roderick, architect, Glebeland, Merthyr Tydfil.

**WALES**.—Dec. 6.—For reconstruction and alteration of the Methodist chapel, Llansawel. Mr. David Jenkins, architect, Llandilo.

**WALES**.—Dec. 15.—For adding a third lift (100 feet diameter by 24 feet deep) to the present two-lift holder at the Treforest, Pontypridd, gasworks. Mr. Edward Jones, engineer, Treforest.

**WALES**.—Dec. 16.—For erection of a new infants' school vice the present Ynyscedwyn infants' school, on a field near the rectory, Ystradgynlais, to accommodate about 180 scholars. Mr. Philip Williams, architect, Ty'r Gorof, Ystradgynlais.

**WALSALL**.—Dec. 6.—For erection of a junior mixed department and enlargement of the present buildings at Palfrey school, Walsall. Messrs. Bailey & McConnell, architects, Bridge Street, Walsall.

**WANDSWORTH**.—Dec. 1.—For erection of buildings and other works at Waterside Wharf, Jews Row. Particulars may be obtained at the Surveyor's Office, 215 Balham High Road, S.W.

**WANDSWORTH**.—Dec. 2.—For alterations and additions to rate-collector's office and gas-testing room at 153 High Street, Putney. Particulars may be obtained at the Surveyor's Office, 41 High Street, Wandsworth.

**WEARHEAD**.—Dec. 2.—For taking-down old vicarage at Heatherycleugh, Wearhead, and erection of a new house, stabling and boundary walls. Messrs. Clark & Moscrop, Durham.

**WELLINGBOROUGH**.—Dec. 3.—For erection of a wall on the northern side of the Urban District Council's yard in Cannon Street. Mr. J. T. Parker, clerk, U.D.C., 29 Church Street Wellingborough.

THE Skegness Urban District Council have retained Mr. J. R. Elliott, A.M.I.C.E., of Nottingham, to report upon a sewage purification scheme.

MR. R. H. BICKNELL, M.I.C.E., Local Government inspector, has held an inquiry at Lichfield into the application of the City Council for sanction to a loan of 7,000% in connection with the sewerage scheme. The application was the result of a memorial presented to the Local Government Board about a year ago by the Bishop, Dean, residents of the Close and other prominent citizens alleging serious defects in the sewerage system and various other matters. The Corporation thereupon instructed Mr. J. R. Elliott, A.M.I.C.E., of Nottingham, to thoroughly investigate and report generally upon the matter, with the result that the complaints were found to be justifiable, and various works were recommended to put the city into a good sanitary state. The chief works necessary are a new low-level intercepting sewer to effectually drain the low-lying districts, the taking-up and relaying of the sewers that have back falls or insufficient falls, and the provision of manholes, lampshafts and ventilators; in some cases the existing manholes being about a mile apart. The Inspector went thoroughly into the details of the various proposals, and at the conclusion of the inquiry said that he thought the Corporation had met the memorialists very thoroughly, and he wished particularly to compliment Mr. Elliott upon the excellence of his report, and the careful and fearless manner in which he had brought all the matters he considered necessary before the Council. There was no opposition to the application.

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J. S. Kimberley . . . . .	£224	0	0
W. J. Bloxham . . . . .	210	0	0
Orchard & Son . . . . .	195	0	0
E. Clifford . . . . .	126	10	0
N. CLIFTON, Bloxham, Banbury (accepted) . . . . .	113	1	0

### BARNSELEY.

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For supply of about 800 tons of Welsh setts, 4½ inch by 8 inch by 6 inch.

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### BRADFORD.

For alterations to lavatories at Marshfield schools, and for additional heating and ventilating required at Lorne Street school.

HARTLEY & SOUTHWART, Thornton, Bradford (accepted).

### BRIGG.

For construction of sewers and sewage-disposal works at Brigg, Lincs. Mr. R. E. W. BERRINGTON, engineer, 28 Victoria Street, Westminster, S.W.

B. Cooke & Co. . . . .	£8,317	0	0
Hewins & Goodhand . . . . .	7,353	0	0
Jones Bros. . . . .	6,875	0	0
W. H. Reading . . . . .	5,895	0	0
B. Robinson . . . . .	5,652	0	0
Raynor . . . . .	5,533	0	0
J. Brunton . . . . .	5,528	3	6
A. H. Atkinson . . . . .	5,522	16	3
J. Sanguin . . . . .	5,397	17	8
CAMPION & MEDFORTH, Bridge Street, Brigg (accepted) . . . . .	5,246	14	2

### CONWAY.

For strengthening and widening of Conway suspension bridge.

Mr. J. J. WEBSTER, architect.

Anthony Fasey & Sons . . . . .	£7,106	6	4
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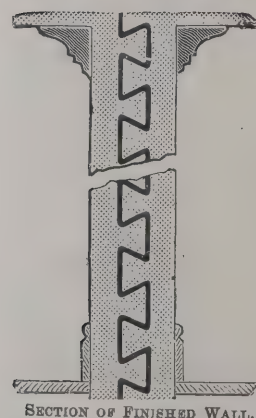
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ILFORD—continued.

For street works in Bathurst, Prymont, Henley, Mortlake, Hunter and Kingston Roads.

PARSONS & PARSONS, Ilford (accepted) . . . £1,796 0 0

IRELAND.

For erection of a new shirt factory at Belview Avenue. Mr. J. M. C. KNOX, architect, 2 East Wall, Londonderry. Quantities by Mr. JOHN FERGUSON.

Shannon & Routledge . . . £2,889 0 0

Robert Colhoun . . . 2,780 0 0

Alexander Dunlop . . . 2,779 0 0

JOSEPH BALLINTINE, Londonderry (accepted) . . . 2,349 0 0

For erection of fourteen labourers' cottages, Monaghan. Mr. WM. McMAHON, architect, Clones, co. Monaghan.

Patrick McGorman, Clones . . . £137 15 0

" " (two cottages) . . . 125 10 0

Robert Johnston, Rosslea . . . 119 10 0

Michael McEntee, Ballybay (three cottages), each . . . 111 10 0

James McEntee, Ballybay . . . 112 0 0

Thomas McKenna, Monaghan (three cottages) . . . { 117 0 0

113 0 0

117 0 0

Note.—Four not dealt with.

For supply and erection of about 500 yards of wrought-iron railings and eight gates round the Anderson Park.

J. L. ARNOT, 204 Bath Street, Glasgow, railings £152 16s. 4d., gates £9 18s. per set (accepted).

KEIGHLEY.

For sewerage works in Damems Road. Mr. W. H. HOPKINSON, borough engineer.

HIRD & HOULDSWORTH, Damems Road, Ingrow

(accepted) . . . £308 19 3

LONDON.

For additions and alterations to Knighthayes, Gelder's Hill, N.W. Mr. E. ASHLEY TOOMBS, architect, 12 Keith Gardens, Uxbridge Road, W.

Maple & Co. . . . £532 0 0

A. Dowdall . . . 470 0 0

Gough & Co. . . . 414 0 0

C. Plowman . . . 398 0 0

W. Tout . . . 355 0 0

J. Stewart . . . 335 0 0

O. EARL, Potter's Bar (accepted) . . . 320 0 0

MALDEN.

For construction of a 6-inch stoneware pipe sewer at the back of premises, 15 to 24 Edmiston Square, Old Malden.

Atkins . . . £157 0 0

Drewitt & Son . . . 93 3 9

London and County Builders, Ltd. . . . 86 13 0

R. W. Swaker . . . 79 17 0

Sudbury & Son . . . 75 10 0

A. C. Soan . . . 67 15 0

H. Taylor . . . 60 10 6

R. E. Shaw & Co. . . . 60 0 0

ADAMSON, Kingston-on-Thames (accepted) . . . 59 19 2

MORESBY.

For erection of a pair of semi-detached houses at Mill Grove. Mr. J. S. MOFFAT, architect, 53 Church Street, Whitehaven.

A. & T. H. ANDERSON (accepted).

NORWICH.

For roofing the pig-market.

BOULTON & PAUL, LTD., Norwich (accepted) . £630 0 0

POOLE.

For street works, &c., Albert Lane, Parkstone. Mr. JOHN ELFORD, borough surveyor.

H. C. Buxey . . . £70 0 0

G. Maidment . . . 69 0 0

W. P. Saunders . . . 64 0 0

G. T. BUDDEN, Newtown, Parkstone (accepted) . 58 0 0

RAMSBOTTOM.

For the reconstruction of the existing tanks, sludge filters, &c., at Summerseat, near Ramsbottom, Lancs.

J. & D. BLUNN, LTD., Villa Road, Oldham (accepted).

ROCHDALE.

For the supply of a new steam-boiler for heating Baillie Street school, for the School Board.

HUTCHINSON BROS., Bury, Lancs (accepted) . £122 0 0

RAWTENSTALL.

For street works in eighteen front and back streets within the borough. Mr. A. W. LAWSON, borough surveyor.

P. D. & S. D. HAYES, Heaton Norris, Stockport (accepted).

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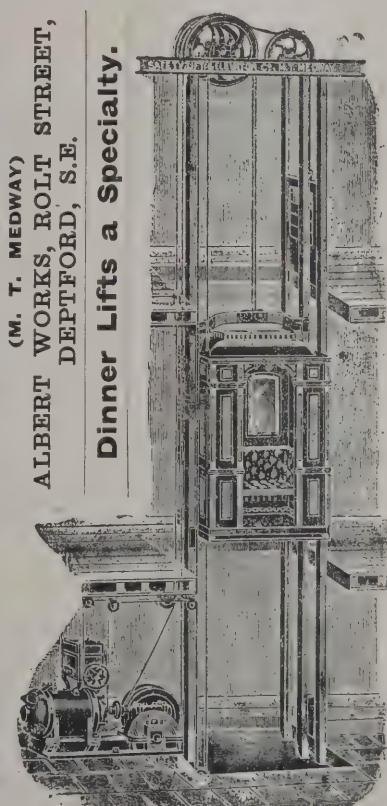
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## ROYDON.

For erection of a house and lodge at Roydon, Essex, for Mr. C. A. Christie, of Hoddesdon, Herts. Messrs. NEWMAN & NEWMAN, architects, 31 Tooley Street, London Bridge. Quantities by Messrs. SELBY & SAUNDERS, of 39 Victoria Street, Westminster, S.W.

	House.	Lodge, &c.
Bex . . . . .	£4,680 0 0	£690 0 0
Sharpington . . . . .	4,660 0 0	730 0 0
Lawrence & Sons . . . . .	4,494 0 0	694 0 0
Hitch . . . . .	4,481 0 0	682 0 0
Holloway Bros. . . . .	4,366 0 0	673 0 0
Webster & Cannon . . . . .	4,328 0 0	748 0 0
Horrocks . . . . .	4,275 0 0	670 0 0
Goddard & Sons . . . . .	4,196 0 0	696 0 0
Bentley . . . . .	4,178 0 0	668 0 0
J. HUNT, Hoddesdon (accepted) . . . . .	3,958 0 0	638 0 0

## SCOTLAND.

For taking-down and rebuilding part of the quay wall on the east pier of Kirkcaldy Harbour. Mr. ROBERT HENDERSON, engineer, Burntisland.

A. Cameron . . . . .	£1,351 12 6
T. & G. Menzies . . . . .	912 10 9
J. Adam & Co. . . . .	864 0 0
J. Kennedy . . . . .	754 11 0
G. SMITH & SONS, Kirkcaldy (accepted) . . . . .	734 2 11

For sewerage works at St. Monan's Common. Mr. HENRY BRUCE, engineer, Cupar-Fife.

O. Mitchell . . . . .	£717 15 2
W. Taylor . . . . .	476 1 1
R. Gilmour . . . . .	412 0 3
R. Skinner . . . . .	404 0 2
Stirling & Kinniburgh . . . . .	354 13 11
R. C. Brebner & Co. . . . .	319 19 0
J. MARTIN, Dunfermline (accepted) . . . . .	268 15 6
J. Mackay . . . . .	266 0 8

## SILLOTH.

For erection of two houses. Mr. GEO. ARMSTRONG, architect, 24 Bank Street, Carlisle.

	Accepted tenders.
J. Gannan, plasterer . . . . .	£110 0 0
J. Taylor, plumber . . . . .	89 5 0
J. T. Kellett, slater . . . . .	57 0 0

## SUDBURY.

For supply and erection of two steam-pumping engines at the sewage-pumping station, Sudbury, Suffolk. Mr. T. W. A. HAYWARD, borough engineer.

Dodman & Co., Ltd. . . . .	£2,077 0 0
Stewart & Co., Ltd. . . . .	2,038 0 0
Wolstenholme & Son . . . . .	2,036 0 0
W. R. Renshaw & Co. . . . .	1,965 0 0
Worthington Pumping Engine Co. . . . .	1,878 0 0
W. Manders . . . . .	1,826 0 0
BARTON & Co., Sudbury (accepted) . . . . .	1,718 0 0

For erection of machinery and destructor buildings at the sewage-pumping station, Sudbury, Suffolk. Mr. T. W. A. HAYWARD, surveyor.

E. West . . . . .	£3,000 0 0
J. F. W. Bray . . . . .	2,418 0 0
W. Chambers . . . . .	2,199 0 0
C. Theobald . . . . .	1,719 0 0
W. MANDERS, Leyton (accepted) . . . . .	1,715 0 0

## SWINDON.

For erection of Jenning Street Board school, Swindon. Messrs. BISHOP & PRITCHETT, architects, Swindon.

Wills & Sons . . . . .	£10,290 0 0
C. Williams . . . . .	9,984 0 0
Tydemans Bros. . . . .	9,866 15 0
J. Williams . . . . .	9,857 17 0
Wilkins & Sons . . . . .	9,639 0 0
S. Chambers . . . . .	9,530 10 0
H. & C. Spackman . . . . .	9,418 13 6
A. J. COLBORNE, Swindon (accepted) . . . . .	9,199 17 0

## TRURO.

For altering premises at rear of market hall to form fire-engine stations, conveniences, &c. Mr. MEASHAM LEE, city surveyor.

H. Tippett . . . . .	£245 7 7
J. COLLIVER, Truro (accepted) . . . . .	237 12 2

## WALES.

For erection of wire fencing at Lower Neuadd reservoir, Merthyr Tydfil. Mr. T. F. HARVEY, engineer. HILL & SMITH, Brierley Hill (accepted).

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WALES—continued.

For sewerage in the village of Pontwalby, in the parish of Rhigos. Mr. JAMES P. JONES, surveyor.

R. W. Hunter	£142	0	0
C. E. Thomas	99	0	0
W. Lewis	79	12	0
J. JONES, Graigfargoed, Treharris, R.S.O. (accepted)	79	2	10

WALSALL.

For erection of cart-sheds, stables and other buildings, and alterations to existing buildings at Daw End, Rushall, Walsall. Mr. FREDERICK W. MAGER, district surveyor.

W. D. Oakley	£819	12	5
W. H. Gibbs	775	0	0
D. Smith	752	18	0
J. Herbert	729	0	0
W. Clare	701	18	9
J. Mallin	680	0	0
J. Holden	661	5	0
J. Bates	652	7	0
W. H. James	600	0	0
W. TILDESLEY, Portobello, Wolverhampton (accepted)	555	0	0

For sewerage works at Daw End, Rushall. Mr. FREDERICK W. MAGER, district surveyor.

S. Saunders	£935	0	0
J. Barnes	791	0	0
J. Mackay	599	1	3
J. ATKINS, Walsall (accepted)	464	0	0

Received too late for Classification.

BROMSGROVE.

For erection of the proposed new lunatic asylum on the Barnsley Hall estate, near Bromsgrove, Worcestershire. Mr. GEORGE T. HINE, architect, 35 Parliament Street, Westminster. Quantities by Mr. G. KENWRICK, Birmingham.

J. G. Fincher & Co.	£201,450	8	4
F. E. Davey, Ltd.	198,502	0	0
Josh. Howe & Co.	194,630	0	0
Kellett & Sons, Ltd.	191,702	0	0
McCormick & Sons	190,678	0	0

BROMSGROVE—continued.

Stephens, Bastow & Co.	£190,202	0	0
J. Guest & Son.	188,725	0	0
D. W. Davies	184,090	0	0
J. Parnell & Son	183,286	0	0
W. Walkerdene	182,856	0	0
Joseph Tilt	179,999	0	0
W. Sapcote & Sons	179,686	0	0
H. Lovatt	178,949	0	0
James Herbert	176,860	0	0
John Dallow	176,360	0	0
Kerridge & Shaw	175,922	0	0
J. Barnsley & Sons	174,776	0	0
Wm. Lee & Son	173,659	0	0
Thos. Rowbotham	171,290	0	0
Gowing & Ingram	170,468	0	0
Thos. Lowe & Sons	168,132	0	0
E. Gray Hill	167,100	0	0
Wm. Hopkins	167,000	0	0
Wm. Crane, Ltd.	166,135	0	0
H. Willcock & Co.	164,448	0	0
F. Lindsay Jones	161,958	0	0
J. & A. Brazier	161,700	0	0
Thos. Johnson	161,220	0	0
Fredk. Evans	156,576	0	0
Smith & Pitts	154,880	0	0
B. WHITEHOUSE & SONS, Birmingham*	151,475	0	0

\* Accepted by the committee.

HERTS.

For a preliminary bore-hole and test pumping in connection therewith, Ware Messrs. BAILEY-DENTON, SON, LAW-FORD & SYMONS, engineers, Palace Chambers, Westminster.

R. D. Batchelor	£480	8	0
Dunn & Booth	452	5	6
T. Tilley & Sons	451	17	6
J. Thom	441	0	0
W. Brown & Son	421	14	9
New Calyx Drill and Boring Company, Ltd.	395	8	0
A. C. Potter & Co.	375	18	0
A. Williams & Co.	338	18	0
LE GRAND & SUTCLIFFE, Magdala Works, 125 Bunhill Row, E.C. (accepted)	320	14	0

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**MACCLESFIELD.**

For erection of a boundary wall round the land intended to be added to the present churchyard, and the forming and draining of footpaths at St. James's Church, Sutton. Messrs. WHITTAKER & BRADBURN, architects, 19 King Edward Street, Macclesfield.

J. Bradburn & Sons . . . . .	£161	0	0
G. Roylance & Co, Ltd. . . . .	122	10	0
H. Berry & Sons . . . . .	79	0	0
W. Cuncliff . . . . .	62	10	0

**COMPETITION OPEN.**

WORKINGTON.—Jan. 20.—Competitive designs are invited for a public library proposed to be erected in Finkle Street, Workington. A premium of 25*l.* will be awarded to the author of the design placed first in order of merit, and a further sum of 15*l.* will be awarded to the author of the design placed second, and 10*l.* to the architect whose design is placed third. Mr. S. Eaglesfield, borough surveyor, Town Hall, Workington.

**CONTRACT OPEN.**

LEEDS.—Dec. 6.—For street works in Conway View and Conway Mount, in the township of Potternewton; Beechwood Crescent and Welton Road, in the township of Headingley-cum-Burley; Branch Street, Bangor Terrace, Bangor View, Bangor Place, Bangor Grove, Bangor Street, Lytham Grove, Lytham Place and Cow Close Road, in the township of Farnley; also for the macadamising and flagging of St. Michael's Lane, in the township of Headingley-cum-Burley. All particulars may be obtained on application to the City Engineer, Municipal Offices, Leeds.

**NEW CATALOGUE.**

MESSRS. THOS. CRAPPER & CO., of Marlborough Works, Marlborough Road, Chelsea, who hold warrants of appointment from the King and the Prince of Wales, have just issued their new catalogue. It is a handsome and carefully compiled compendium of the high-class sanitary appliances for the manufacture of which the firm has achieved a well-deserved reputation. The book, which consists of upwards of 200 pages, is admirably printed and copiously illustrated, and as the prices of all the goods described are plainly given, it is a book of reference which architects and builders will find of real utility.

**TRADE NOTES.**

ASHURST CHURCH, Steyning, has recently been fitted with the well-known "Small Tube" hot-water heating apparatus by Messrs. John King, Ltd., engineers, Liverpool, employing their latest improved economical coil heater.

A LARGE clock, with four dials and striking hours, has just been erected at Sheerness by John Smith & Sons, Midland Clock Works, Derby, to the design of Lord Grimthorpe. The same firm are also making a large clock for the Ripley Co-operative Society's new premises.

MESSRS. W. POTTS & SONS, clock manufacturers, Guildford Street, Leeds, have received instructions to fix a new clock with two external dials at St. Luke's parish church, Harrogate, from the vicar and wardens; a new Cambridge quarter-chime clock for the parish church, Crewkerne, Somerset, and a new clock and bell for the Coronation committee, Haxby, near York.

THE Cranleigh Brick and Terra-cotta Works (E. & A. Miles, Ltd.), of Hazelwood, Cranleigh, Surrey, who supplied about six millions of their facing bricks to the recently completed Christ's Hospital schools at Horsham, have received an order for the red facings and moulded bricks for the Southern Hospital at Carshalton, where upwards of a million will be required, as well as an extensive order for terra-cotta for the same building.

**VARIETIES.**

ALFRED CLUYSENAAR, who was prominent among Belgian painters for his decorative works, died on Sunday last in his sixty-fifth year.

EMILE BRETON, the French landscapist, has died in his seventy-first year. He was the brother of M. Jules Breton, the painter of peasant scenes, who is also a poet.

A NEW factory is being erected in Domingo Street, St. Luke's, E.C. The architect is Mr. R. J. Lovell, of 46 Queen Victoria Street, E.C.

A NEW Liberal Club has been opened in Seymour Road, Higher Crumpsall, by Mr. F. Cawley, M.P., the member for the division. The premises include a large room for public meetings and a billiard-room containing three tables, as well as reading-rooms and card-rooms. It takes the place of a small building which has been in use for seven years.

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## ILLUSTRATIONS.

LIVERPOOL CATHEDRAL COMPETITION: DESIGN SUBMITTED BY MR. H. A. BRIGGS, F.R.I.B.A.—SOUTH ELEVATION. INTERIOR VIEW LOOKING EAST, SHOWING CENTRAL OCTAGON.

TELEPHONE HOUSE, VICTORIA EMBANKMENT, E.C.

CATHEDRAL SERIES: HEREFORD.—THE NORTH DOOR. A COFFIN LID.

A RUMOUR is afloat to the effect that the site of St. James's Hall and Restaurant, in Piccadilly, is likely to be acquired by an American syndicate for the purpose of erecting in their place an enormous hotel and restaurant, and some colour is lent to the report by the fact that Messrs. Chappell & Co. have secured a lease of Queen's Hall in which to hold their popular concerts.

THE *Pall Mall Magazine* is undoubtedly one of our best illustrated monthly productions. The Christmas number for December is no exception, and is replete with interest from cover to cover. From an architectural point of view, the article with illustrations on seven new cathedrals, viz. Truro, Westminster, Brisbane, Cape Town, New York, Berlin and Liverpool, possibly will be found the most interesting to our readers.

THE altar of the chapel of the Sacred Heart in St. Charles's Church, Upper Ogle Street, London, has now been completed by the erection of the reredos from the designs of Mr. S. J. Nicholl, the architect of the entire work. The reredos forms a screen entirely across the chapel, rising to the springing of the vaulted ceiling, and comprises statues of Our Lord and of four angels bearing the emblems of the Sacred Passion, with tabernaclework and other accessories. The work was executed by Mr. A. B. Wall, of Cheltenham.

THE second meeting of the session of the Chester and North Wales Archaeological Society was held on Tuesday evening last, when Mr. W. Ferguson Irvine (hon. secretary of the Record Society of Lancashire and Cheshire) read a paper entitled "Chester in the Twelfth and Thirteenth Centuries," being notes on a number of recently-discovered documents relating to the city of Chester dealing from the year 1170. The paper was illustrated by excellent lantern slides (made by Mr. Newstead), and by kind permission of the owner of the documents the originals were on view for inspection. Dr. Stolterfoth presided over a small attendance.

M. T. THORNTON, who has for some time filled the post of assistant town clerk for the city of Leeds, was at a meeting recommended to the City Council for appointment to the position of deputy town clerk, which has been vacant since the resignation a little while ago of Mr. C. C. Jolliffe. The salary attached to the office is 450*l.* a year, advancing by yearly increments of 50*l.* to 750*l.* The recommendation was made by the finance committee, over which Ald. Gordon presided. At the same meeting it was decided to increase the salaries of two assistant-solicitors in the town clerk's office from 250*l.* to 300*l.*, and of the third from 200*l.* to 250*l.*

THE new Roman Catholic church of St. Cuthbert, Palatine Road, Withington, was formally opened on Sunday last. The new church, which is estimated to cost 15,000*l.*, has been designed by Messrs. W. Telford Gunson & Sons, of Manchester, and is in the Byzantine style of architecture. In this respect it is a reproduction in miniature of the new Roman Catholic cathedral at Westminster. The length of the building is 100 feet, the width across the transepts 68 feet, with a height throughout of 60 feet. The church, which provides seating accommodation for 450 people, is handsomely decorated by means of a high dado of tiledwork that extends all round the building. The rest of the walls are of polished brick, in which spaces are left for the insertion of pictures of the stations of the cross or of saints. The church is lighted by electricity, and when the walls have dried sufficiently a new organ will be placed in the gallery which has been erected over the sacristy and the confessionals.

## BUILDING AND BUILDERS.

OWING to the rapid growth of the urban district of Kirkby-in-Ashfield, Notts, the Council have resolved to extend their waterworks, and have instructed Mr. J. R. Elliott, water and sanitary engineer, of Nottingham, to prepare a scheme for doubling their present capacity.

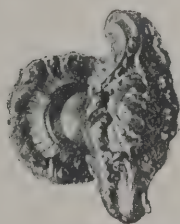
THE foundation-stone of a United Methodist Free church which is being erected in Lawrence Road, Liverpool, was laid by the Lord Mayor (Mr. W. W. Rutherford) in the presence of a large gathering of members of the denomination. The church is in the Renaissance style of architecture, and is of red brick with white stone facings. It will seat about 450 persons, and the schools underneath will have accommodation for 350 children.

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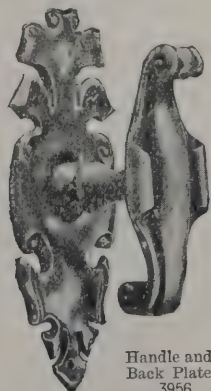


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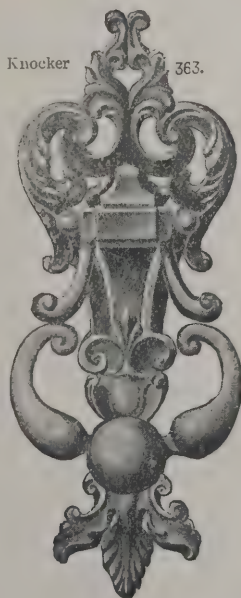
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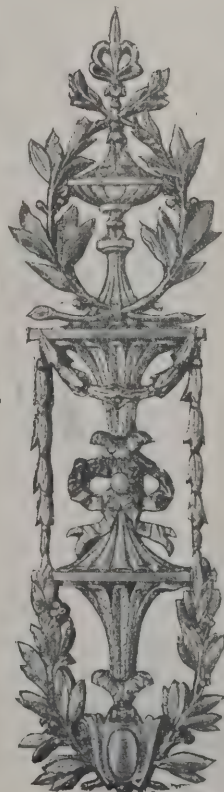
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In his report on the circumstances attending the collapse of the tunnel near Loudwater, which is being constructed by Messrs. Panting for the Great Western and Great Central Railways, Mr. C. L. Morgan, the Board of Trade inspector, considers that the timbering ordinarily in use is not of sufficient strength to bear any sudden additional pressure, and that the collapse was due to an unexpected strain from the excessive weight above. As there was no sign of any fault, the mishap must be held to be a pure accident, the tunnel being driven through chalk to all appearance sound and good.

SOME time ago a small dispute arose between Messrs. Tomkinson & Sons, builders, and some of their plumbers respecting the amount of money due to the latter. The board of arbitration, consisting of four masters and four employes, appointed to interpret the rules affecting such a case as the one in question, was not called upon to act, the operatives employed on Messrs. Tomkinson's jobs and at their shop being instead called out. This has led to an extension of the trouble, the Master Builders' Association of Liverpool having issued a forty-eight hours' notice, expiring on Saturday, to lock-out the whole of the operative plumbers in the Liverpool district unless the men at Messrs. Tomkinson's returned to work. This they had not done up to Saturday, and, consequently, the lock-out notice took effect. Upwards of 300 plumbers are affected.

### ELECTRIC NOTES.

THE recently completed electric-light and power works at West Drayton were publicly declared open by Mrs. Donaldson Hudson, of Cheswardine, on Monday evening. The function was a brilliant one in every sense, for, in addition to the influential company present, the whole of the town was during the evening brilliantly illuminated with thousands of fairy lamps arranged with telling effect. At the conclusion of the ceremony Mrs. Donaldson Hudson was presented with a switch letter-weight as a memento of the event.

AT the meeting of the Rugby Urban District Council, the electric-lighting committee reported having considered the electric-lighting scheme in view of the refusal of the Rugby School authorities to take their supply from the town, and they unanimously recommended the Council to proceed with their scheme with all possible speed. Certain alterations in the routes in which it was proposed to lay cables—made possible by the refusal of the School—would reduce the present capital

outlay by 2,000 $\frac{1}{2}$ %, and, assuming the demand would amount to 100,000 units, there was an estimated profit on the first year's working of 213 $\frac{1}{4}$ %. Mr. Hunter, in moving the adoption of the report, said there was a great future for the electric light in Rugby, and the undertaking should be in the hands of the ratepayers. Mr. Styles wanted to know what caused the School authorities to withdraw. There was a loophole somewhere, and he wanted to put his finger on the spot. Mr. Hunter said he did not know it was possible to put a finger on a spot in a loophole. The report was adopted, Mr. Styles alone dissenting.

### INFLUENCES AFFECTING MODERN BUILDING.\*

To start making a list of all these influences recalls a political skit of some years ago, when it was reported of a statesman who was described by another statesman as being as fluent as a waterspout after rain, that it took less time to repeat all the things he did not say than those he did. The number and variety of influences which affect modern buildings is so extensive that a few moments' consideration suggests the almost impossibility of tabulating them. Cost, choice of materials, site, aspect and similar considerations necessarily come first; but the prevailing architectural fashion, the restrictions which the liberty of the subject in a free country must impose—and very frequently the certainty that local development will within a limited time and under progressive conditions sweep away the building we now erect in favour of others embodying features as yet unknown—are even more potent factors.

To fully appreciate the effects of these influences, a little modern history will be sufficient; in fact, no line of argument is ever so clearly convincing or so directly emphatic as that of comparison—the old with the new, for example, in the present instance.

Compare the building materials we now employ with those of one hundred years ago. Bricks were then made partly of clay, variously described as sand-stocks, slop-moulded, hand-made, whilst to-day almost universal is the use in this city of machine-made shale-bricks, possessing probably not a particle of clay, and almost equally common on the continent of Europe is the use of hollow bricks made of pure clay. The old sand-

\* A paper read before the Institute of Architects of New South Wales, Sydney, by Mr. Cyril Blackel, vice-president, and published in the *Building, Engineering and Mining Journal*.

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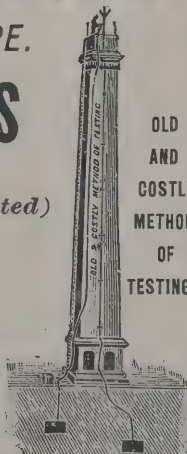
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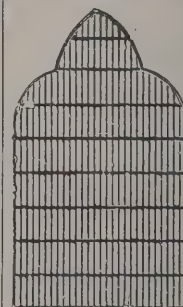
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stock weighed about 6½ lbs., and absorbed after immersion about 8 ozs. of water. The shale-brick of to-day weighs about 8½ lbs., and absorbs from 15 to 30 ozs. of water, whilst the continental hollow brick weighs about 5½ lbs., and absorbs about 3 ozs. of water.

The result of this is that whilst cavity walls were unknown till recent years, and are rarely used in Europe, they are with us almost an article of architectural faith with many of our architects, more especially the younger men.

Take another building material—gall-corr-iron—which especially in the country is used so extensively that it is generally a matter requiring some tact and persuasion to induce clients to adopt any other roofing cover. One hundred years ago this was practically unknown. The effect of the so general use of corr-gal-iron for roofing is the flat roof of light construction, the wearisome monotony of most of our country towns, the avoidance of materials which nature in many instances provides close to hand such as shingles, and a general lowering of the standard of design.

Or if we take the material with which we finish the interior walls of our houses, known as plaster, stucco and one or two other names, we find an equal variance between the old and new conditions. In early days shell-lime burnt at Cook's River and sand mixed with "Paddington loam," as it was called, were used for plaster, the loam containing a portion of clay. Now stone lime slacked some weeks before using, mixed with sharp sand washed free from clay, is most in demand in Sydney, whilst in France a thick coat of a rough quality of what we know as plaster-of-Paris would be used.

Formerly all our laths were split, generally of stringy bark, now generally of sawn pine, wire netting or expanded metal, whilst in many instances fibrous plaster in which plaster-of-Paris is the principal ingredient is taken in large blocks ready made to the job and screwed into position.

At one time so universal was it that the base on which every building sat was a block of stone that the expression "foundation stone" became an idiom; now, however, you will commonly hear a builder describing to another the progress made by explaining that "the concrete" is complete, meaning the footings, clearly showing how concrete has displaced stone, especially in building work of a heavy character. Concrete on the Monier and kindred systems is developing possibilities of which we never dreamt, whilst fireproof flooring containing 40 per cent of coke has been generally approved by architects, and as generally condemned all within a few years, owing

partly to the fact that in a few of our public buildings the fireproof coke concrete caught fire, and partly because it was found that the combustible material used in this concrete was about twice as great as the fuel needed to burn the terra-cotta lumber which is now coming into general use for fireproof ceilings and partitions.

In stonework we find that Governor Hunter wrote to the Downing Street authorities from the neighbourhood of the Sydney Exchange that neither clay for making bricks nor stone suitable for building were obtainable in the settlement, so that all the buildings must be erected in wood. Later on the Governor reported that he had found suitable clay in the country some miles from the settlement—that is to say, near Christ Church—but that no building stone was available.

Another stage is that of the use of stones so small that one man could turn them about, one reason for which is made obvious by the hieroglyphics by which some early Australian masons, who were not necessarily freemasons, showed how they spent their time.

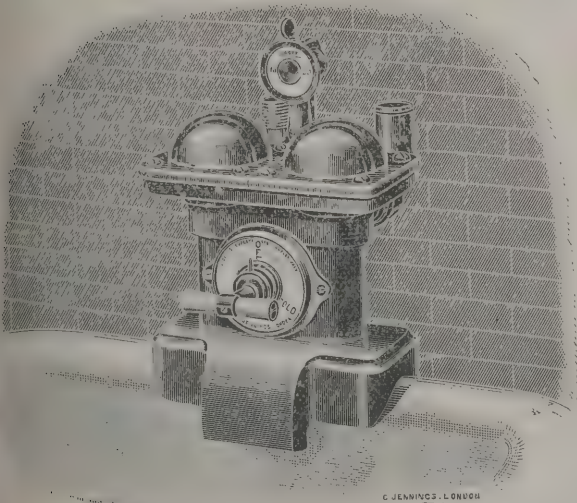
A later development was the use of very large stones moved by steam cranes, whereby the labour on the beds and joints was greatly decreased. In this connection I can recall an incident in which our worthy President was one of the parties. A builder who felt sorry for himself in being unsuccessful in obtaining a job from that architect's office, and who probably appreciates that the increasing size of the blocks of stone would necessitate an expenditure for heavier cranes, &c., quoted to me, who was then only a boy, that the way to get a job in Mr. Mansfield's office was to offer to make the whole front in one stone.

But to leave building materials and to pass on to other influences. Years ago there was no sewerage system necessitating large areas to each building, as also the discharge of house water over the surface. In fact every man did what appeared right in his own eyes. That this neglect of sanitation was a danger, and was periodically appreciated by the authorities, is apparent from the regulations issued by the early Governors, that all huts within 100 yards of the Tank Stream, which was the only water-supply, were to be at once removed, and that any woman found washing clothes within a like distance would be severely punished. Or to go further afield, we learn from the reports of a commission appointed to inquire into the causes of cholera in England half a century ago, that as the farmer regarded the fertility of his land as of the first importance, and this was dependent upon his supply

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of manure, this was a matter of such consequence that he usually heaped it up against the blank wall of his residence, so as to be both literally and figuratively under his own eye. Instances of the ignorance or laxity in sanitary matters might be quoted without end as existing fifty years ago, but now in this city we are blessed with three distinct varieties of sanitary inspectors, who in their enthusiasm occasionally exercise the authority they possess to the extent of compelling a city taxpayer to lay bare for their inspection a drain-pipe which apparently is working well and satisfactorily, but which might, in some respect, be capable of improvement. That this influence upon modern buildings has been an unqualified success we architects all agree, but never so fully do we appreciate it as by comparing matters as they are, bad as they may be, with what they were in years gone by.

I am told that in 1898 a building was erected in Park Row, New York, 429 feet high, and consisting of thirty-three floors, including cellars, half storeys, rooms in roof, &c. Such a building was impossible, financially at least, before the year 1855, when the invention patented by Henry Bessemer enabled steel to be produced from iron at a small cost, bringing down the price from about 90% to 9%, in round numbers. This building contains 7,000 tons of steel, which cost about 70,000%, as against about 700,000% before Bessemer's invention. Without this steel construction the basement walls if made of sufficient thickness to support with safety the great height would have made the lower storeys almost solid brickwork.

Our forefathers lived in houses rarely exceeding three or four storeys in height, of which the top floor was almost entirely composed of lumber-rooms, garrets, servants' quarters, &c., for which purposes alone was it suitable owing to the serious drawback of the stairs.

Their living-rooms were almost entirely on the first and ground floors.

The rapidly increasing use of hydraulic lifts enables the tenth floor to be made as accessible as the third, so that the same area of roof covers a very much larger building.

Gas, electricity and telephones have introduced further influences on design, as there is now no need for the coal-cellar, the lamp-room, or the wire-pull bell, as by pressing a button the room becomes brilliantly lighted for the exact length of time desired; by turning on and lighting the gas-fire the room is warmed and brightened, and by means of the telephone a conversation may be had without the intermediary assistance of the messenger. In fact, the very names given as indicating

power, capacity or force in electrical matters, called as they are in many instances after modern chemists and electricians, sufficiently prove how extremely recent is this innovation—ampere, volt, ohm, kilowatt, &c.

That obnoxious insect the white ant is responsible for a good deal, and his influence on modern buildings is considerable.

Probably, however, popular opinions and habits have done more to cause architectural changes than anything else. How rare was a bath-room in houses 100 years ago, but now not only would its absence be worthy of comment, but in a house of any pretension tiled walls, a self-draining floor, a hot-water apparatus, shower, &c., are expected at the least.

In old days a w.c. in conjunction with the living rooms was an impossibility, but now such are usual even where a municipal sewerage system is not available. A reversion to the old-fashioned cesspit, situated 50 to 100 feet from the house, on the ground of health, would be indeed a change for us to-day.

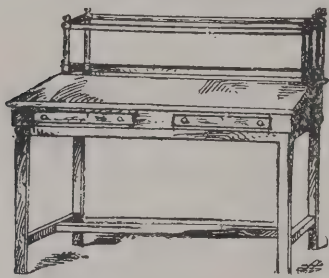
In the matter of water supply, it seems only a few days ago that in Sydney the question of lead poisoning through drinking water from a lead cistern in the roof which was not coated was a burning subject for newspaper controversy, whilst an underground brick tank in which the roof water was stored was the ordinary expectation, even in allotments of 25 feet frontage, where of necessity the w.c. cesspit and the underground tank must have been close neighbours. Now such a proposal would be stopped by the health authorities as an outrage on the public welfare.

A Building Act, which every modern city of any pretensions is bound by, states that only certain materials may be used in the construction of buildings, and that they must be put together of specified thickness, with limited projections to the mouldings, &c., and windows only overlooking certain ways.

The Factories Act provides that the ventilation must be as approved, fire-escape stairs provided, lavatory and other similar accommodation provided to suit the convenience of the workers, with special consideration for the sexes. A dining-room must be provided if the workers demand.

The Act which deals with the licensing of hotels ordains that in any case there must be four bedrooms and two sitting-rooms, exclusive of those required by the family, which rooms must all contain 1,200 cubic feet of air.

Another Act provides that all places of amusement, public



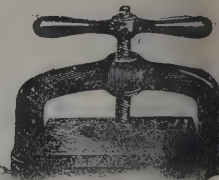
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halls, &c., shall have fire-escape exits of a certain class, shall be seated in a certain way and have provision made for fire prevention and extinction.

Regulations of the fire-insurance companies compel, as far as their influence extends, and that is a long way, that the elevator shall be so constructed as not to increase the risk of fire, and that fire-preventers, such as Grinnell sprinklers, iron doors, &c., shall be part of the building.

Again, modern inventions enable new methods to be employed. Thus by hydraulic pressure a self-acting appliance enables a cellar which is below the level of the sewer to be kept dry and wholesome. A ventilating fan, worked by the same power, will drive air into this cellar and keep it fit for occupation, whilst an electric light completes the transformation of a cellar which in old days was a danger to health, and which would have to be filled up to prevent spreading a pestilence, into a light, airy, healthy room, suitable for a good restaurant.

And this system of utilising every invention is rendered necessary by the overcrowding which modern need brings about. The original street of a chain wide was sufficient to allow sunlight into rooms when buildings did not exceed three storeys in height, but an increase to thirty-three floors necessarily prevents any sunlight reaching the lower rooms. If with the increase of a city's population every street progressed in popularity in equal proportions, an increase of one storey in height would add possibly one-third to the accommodation and sky-scrapers would be unknown, but instead of this, most of the increase comes within a small area, which soon induces a congestion of the street traffic, with the natural result of improved means of transit.

The improved transit, tram service or whatever it may be, further consolidates the population during business hours only, as to live whole lives in such the atmosphere would be unwholesome. We find, then, that the modern tendency is not to "live over a shop," as did our forefathers, but to have the shop in the most crowded thoroughfare and to leave it alone between 6 P.M. and 9 A.M., which time we spend miles away in a dwelling from which all connection with our business is kept as remote as possible.

Our ancestors invariably lived in the cities, we never; the population of a city between 9 A.M. and 6 P.M. might be 250,000, but during the rest of the 24 hours not more than one-tenth of that number. All home comforts are now out of place the city, having migrated to the suburbs.

Our ancestors, in a word, had a more limited choice of materials with which to build, fewer appliances for domestic convenience, placed greater reliance on manual service and were less restricted by laws and regulations. As a consequence less was expected from the architects of their day. On the whole, however, it would, I think, be incorrect to say that their buildings were more solid or enduring than ours. Owing probably in a large degree to the inevitable evolution which all building sites undergo in such rapidly changing phases, our architects are accustomed to seeing—1st, a suburban allotment with a detached house in the centre; 2nd, an additional house on the vacant ground on each side; 3rd, additional rooms in the front garden to be used as shops fronting the street; 4th, the whole pulled down to make room for a different class of building. All these changes within probably one generation; they therefore hesitate about putting more material, and consequently more solidity into a building than the site would warrant.

Unfortunately, any consideration of the influences affecting modern buildings brings to mind such extraordinary changes mostly in favour of the rapidity of modern methods that all kind of absurdity passes current for facts. One such instance is fresh in my mind. An article in the *World's News*, of recent date, speaks of the wonderful rapidity in building made by a contractor whose name was Stewart, and who came, as might be expected, from America. Amongst other evidence of his ability, he induced bricklayers who had been accustomed to lay 400 bricks per day to increase this tally to 2,000 per day. If it were humanly possible for one pair of hands to lift and set 8 tons of material in proper position in the day, or at the rate of a brick to 15 seconds, kept up for eight hours, what class of work would be the result and what time would such work last?

A return supplied to the Minister for Works shows that by day labour the average at the University during 206 days was 839 per day per man, and at the Art Gallery during 371 days 559 per day per man, while at a specially quick country job, where no stuck faces were visible, two men laid 126,000 in eight weeks, or 1,250 per day per man.

During the last eighty years the wages of artisans have greatly varied; for example, a bricklayer's wages per day have been in Sydney as follows:—1823, 6s; 1833, 5s; 1843, 5s; 1853, 15s. 6d; 1854, 30s; 1863, 10s; 1873, 10s; 1883, 12s. 6d.; 1893, 10s; 1895, 8s. 6d.; 1902, 11s.; whilst the same class of bricks sold in 1883 for 3d. per 1,000, in 1893 17s., and at the

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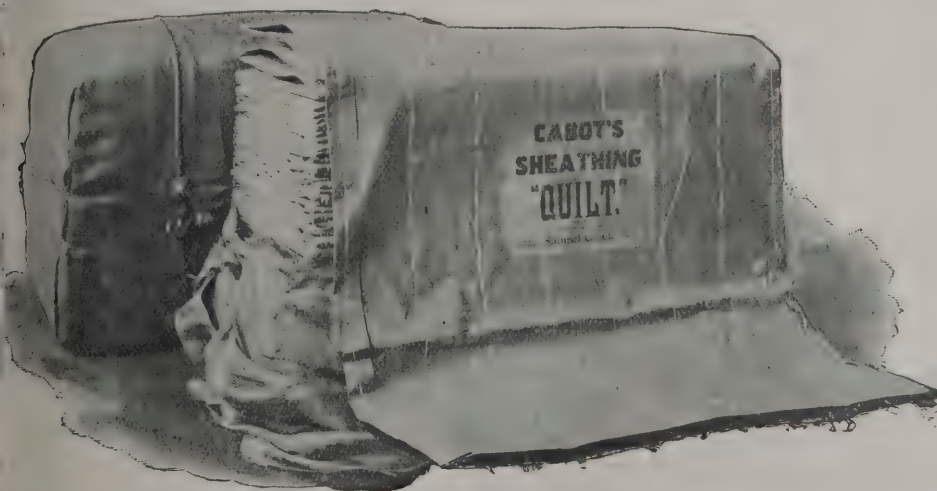
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present time 38s; whilst many other building materials have varied proportionately.

The decade between 1880 and 1890 was noticeable, in this State and Victoria, as the age when jerry building in its worst aspect was rampant; but the passing of an Act, known as Reid's Act, to regulate the width of streets and lanes, although not directly referring to buildings, has indirectly had a depressing effect on this class of property in this State, possibly because a better thoroughfare merits a better class of building.

Some of the materials now in common use, such as metal lathing, fibrous plaster, Bagasse plaster, O.K. bricks, hollow bricks, stamped steel or zinc for ceilings, Monier concrete, opalite wall lining, trachyte, silicate, enamelled iron ware, tar paving, prismatic pavements, &c., were unheard of a few years ago; whilst cast-iron balcony rails, cement decorations and boxed-in sheet-iron baths were within the last twenty years the height of fashion.

Historians generally agree that the most potent factors in changing during the sixteenth century the prevailing Gothic—which for 500 years previous had dominated England—into the Renaissance were in no sense architectural, but were the invention of the mariner's compass, which doubled the size of the world; the invention of printing, which enabled thinking men to spread their thoughts without restriction, and the invention of gunpowder, which, by changing the entire basis of warfare, diverted the rampant militarism of the age into avenues of adventure and discovery, rather than into domestic and intertribal feuds.

In a similar way the most effective influences affecting modern buildings are, I think, only remotely in many instances connected with architecture; the social habits of a people come easily first with their varying peculiarities. Who can say that billiards, as played with us or in England, has not affected the design of houses? and in all probability ping-pong will do the same. Some years ago small dances in private houses were much more common than now, when fewer and more imposing functions are in vogue, and they are held at public rooms hired for the occasion, whilst the billiard-room, which in former years was essentially a main retreat, is now frequently the lounge where receptions of a less formal character are held for both sexes.

Next in importance comes climate as an influence, and here I would like to point to the absurdity of those who bewail our incapacity as modern architects in not evolving an "Australian style." Just imagine what is conveyed by the word. Could a

domestic house be designed equally suitable for Finland, Greece and Egypt? Because this is almost the grasp of an Australian style. Cogan tells us that during July one half of the Commonwealth has a mean temperature of from 40 to 64 degrees and the other half from 64 to 80 degrees, whilst in December half of the continent never reaches 83 degrees, and the other half goes frequently to over 100 degrees. Even in New South Wales, he says, there are three marked divisions of temperature. The coastal districts north of Sydney have a mean temperature of 78 degrees in summer and 59 degrees in winter, whilst those south of Sydney are 67 degrees in summer and 52 degrees in winter. He adds that "the famed resorts on the Mediterranean seaboard bear no comparison with the Pacific slopes of New South Wales, either for natural salubrity or for the comparative mildness of the summer and winter."

### COLUMNS FOR BUILDINGS.

THE durability of iron or steel columns is such an important element in the possible age, or lasting capacity, of the modern high building that it has once more, says the *Engineering Record*, come to be a subject of most careful and rather wide discussion. The modern steel building frame commonly carries the entire load sustained by the structure, including its own weight, and the columns are the main supporting members of the frame. Any active influence, therefore, which tends to impair the strength of the columns or to trench upon their durability weakens—and possibly fatally—the resistance of the building itself.

The danger of corrosion in iron and steel columns is no new subject of discussion, for engineering literature gives abundant evidence of its recognition at least forty years ago. Some of the most prominent forms of column section in the early days of iron and steelwork were closed, thereby making it impossible to inspect their interiors and to protect them by painting. So essential, however, to its durability was the accessibility of the interior of a column considered that closed sections were permitted in bridge-work for a short period only. The question was ably argued and experiences supporting both sides were cited, but the case was hopeless for the closed section and it was soon abandoned. In spite of this result for exposed columns, like

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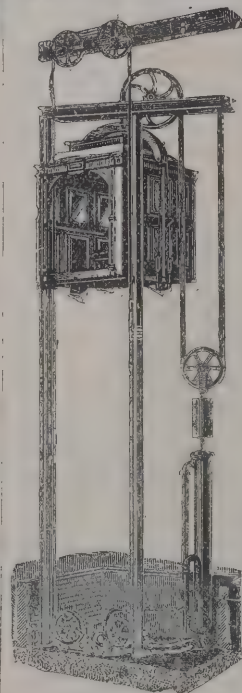
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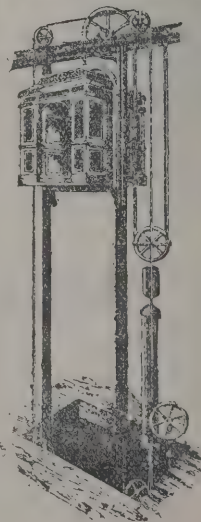
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those in bridges, an entirely different conclusion has been reached in connection with iron and steel columns used in buildings. Although closed columns, even in buildings, have been criticised and their comparatively short life set forth, together with all the sources of corrosion which, it has been alleged, would give them very uncertain tenure of life, they have held their own, and they form to-day the prevailing type of member for buildings. It is true that the Z-bar and some other forms which are not closed have been used to a considerable extent, and that some of the more prominent early closed sections have been either largely or wholly displaced, but the fact remains that the closed box column in one shape or another largely occupies the field in spite of the fact that its interior cannot be painted after the completion of the steel frame.

It is obvious that there must be some strong reason for this particular feature in structural development. It has been many times earnestly argued that the life of such a column must necessarily be limited by attacks of corrosion, both at the interior and exterior surfaces. Nevertheless, it persists, and it must be admitted that any serious danger arising from this particular feature of deterioration yet remains to be established. Undoubtedly, in a considerable number of cases, experience has shown the existence of some oxidation, but to no great extent; and in no case of good design has the rate of oxidation been shown to threaten serious danger within any reasonable period.

It is beyond question that the exposure of a bridge column is far more severe than that of practically any column standing in a well-designed building. In the latter case, compression members are usually entirely surrounded by masonry of one class or another, constituting almost complete protection even when the columns are embedded in an exterior wall, subjected to driving rainstorms.

The fact that every type of box column leads to more simple and convenient detailing than any other class of compression members undoubtedly accounts, in a large measure, for its wide adoption; but this fact alone is not a sufficient reason for the existing situation. In addition to it there is at least the strong opinion, based upon considerable experience, that no sensible amount of corrosion need be apprehended with any period affecting immediate values or those likely to exist in the near future. It may not be demonstrable that this judgment is not defective, but it is beyond reasonable doubt the most potent factor in the persistence of the closed column. Whether further developments in building construction will

continue the use of that column is a different question. Experience has shown enough to indicate, however, that when the box column or its type is displaced by another, the governing influence will be greater economy or some motive other than apprehension of interior corrosion.

The development of concrete-steel construction may indicate the field in which the improved column is to be found. Although the combination of concrete and steel has thus far been employed where greater tensile resistance than that of concrete alone has been imperative, it does not by any means follow that it may not be found advantageous for compression members, especially where a high capacity of resistance to heat of conflagrations is desired. Nearly all steel columns in buildings are enclosed in terra-cotta or masonry of one kind or another, either to secure a more ornate appearance or protection against high temperatures caused by fires. It is but a short and easy step to secure both of these results by a suitable combination of concrete and steel bars other than the usual steel compression member. In a number of cases the interiors of steel columns have been filled with concrete, with an exterior covering of brick or other similar fire-resisting material. Abundant experience has demonstrated the efficiency of concrete protection against corrosion when the concrete is suitably mixed and put in place. A relatively wet mixture is needed so that voids will not exist, and also that the surface of the steel may be covered with a wet cement coating. When steel is so completely embedded in a relatively large mass of concrete it receives rigid lateral support, enabling it to act in compression like a short block rather than like a long column. Under such circumstances each square inch of steel section may properly be assumed to carry much more load than when under conditions requiring the use of a column formula. Again, the concrete is so circumstanced as to sustain a large load itself, probably not less than 40 to 50 tons per square foot. Indeed, by suitably reinforcing the surrounding concrete with light steel sections, such as wire, the concrete's loading could probably be increased to 70 tons per square foot, without violating the canons of good practice. This development in the design and construction of compression members would possess a number of material advantages, including economy. The less expensive shapes of steel could be employed under much higher unit loads, and their combination with concrete would result in a solidity of section making the compressive resistance of that material available as well as attaining complete fire-resisting capacity.

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## THE USE OF GAS FOR WARMING ENCLOSED SPACE.

By THOS. FLETCHER, F.C.S.

I HAVE been asked to reply to an article in the *American Gas Light Journal*, by Dr. W. H. Birchmore, on the above subject. It would be a waste of time and space to traverse and disprove the whole of his curious statements and "assumed" figures; the correction of some of the simple and most glaring errors will be sufficient. It must, of course, be borne in mind that the system of heating used in this country is totally different to that in America, and that the close, dry heat and absence of ventilation there would not be accepted here, and the criticism refers in its fullest sense only to the English methods, although as regards actual facts and practice in America Dr. Birchmore's errors are too glaring to be allowed to pass.

The figures given as a case in practice refer to a room 16 by 12 by 8 feet, 1,536 cubic feet air capacity. According to the English hospital standard, 500 cubic feet space is required for each adult; the room would therefore be large enough to be permanently occupied by three persons. The smallest space allowed in English common lodging-houses is 240 cubic feet for each, and at this rate the room would accommodate say seven persons for sleeping only, to be thoroughly ventilated during the day. The smallest amount of fresh air considered necessary for respiration in English and continental hospital practice is 500 cubic feet per hour for each adult, *i.e.* 1,500 cubic feet for three persons, yet the "Doctor" "assumes" that 100 cubic feet only will be required; why he assumes that the recognised healthy standard is fifteen times too large he does not state. "With a ventilation of 212 cubic feet per hour per head M. Peclet found a slight odour in a public school of 180 children of the age of seven or eight years" (see Box, "On Heat," page 243). For cleanly and healthy persons the accepted minimum is 250 cubic feet for respiration, &c. and 60 cubic feet for lighting. These are the quantities proved to be necessary by the greatest authorities as standards; the fact that Dr. Birchmore "assumes" they are all wrong does not carry much weight, and as his figures are based on this standard, evolved from his imagination, they are of little use.

With regard to heating the air of the room, it may be

accepted that 1 cubic foot will heat 825 cubic feet of air 42.5 degrees, as stated. This, of course, varies greatly with the composition and heating power of the gas, which in the United Kingdom will vary 30 per cent. or more, but that this air when warmed will retain its heat is a state of things existing in Dr. Birchmore's imagination only. The loss of heat by walls and windows has never in any experiments I have made, or in the reports of any trustworthy authorities, been less than 75 per cent., and varies from this to 87½ per cent., independently of ventilation. The most charming point of all is that he "assumes" a renewal of 125 cubic feet per hour in a room 1,536 cubic feet capacity, *i.e.* less than once every twelve hours. Now, as all the greatest authorities state that 500 cubic feet of fresh air per hour will be necessary for each healthy adult, and that the air in the room, if it is to be kept sweet, must be entirely renewed at least three times each hour, and more frequently if possible in case of sickness, it becomes rather interesting to know the result of the proposed reduction. It would probably be difficult to match even in the foulest and filthiest underground Chinese dens; certainly the most crowded and dirtiest English common lodging-house would be paradise compared to it.

I will leave out the question of the comfort and consequent urgent demand in this country for radiant heat in preference to warmed air, flueless stoves and other sources of convected heat, which, although very much cheaper than radiant heat, is greatly disliked in this country. It is possible, under the best conditions, to reduce the loss of heat by a flue to 28 per cent., but such economy as this will be very rare, and it may be taken in average English and continental practice that the flue loss where radiant heat is obtained in any large proportion will be quite 50 per cent. Taking this, the "assumed" 100 cubic feet for ventilation being at least fifteen times as great, and the actual loss by walls and windows being at least 75 per cent. of the whole, Dr. Birchmore's "assumed" figures require a little correction. It would appear that he has actually obtained the results stated in practice, and that by some wonderful method he has done away with loss of heat through walls, &c., opening doors and the many other ways in which heat disappears, and this opens up a new vista and a source of heat hitherto neglected, which should render all fires and stoves unnecessary. It has been found that 284 units of heat are generated per head per hour, and this heat must be dissipated to keep the body in health. It would occupy too great a space to go through the calculations and trace the

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authorities, but those interested will be able to do so by reference to Box "On Heat," page 243. As the average heating power of our local gas is given as 720 units per cubic foot it will only be necessary for three persons to remain in the room to make it too hot for comfort, and that being the case, as proved (?) by Dr. Birchmore, no other heating apparatus will be required, and his wonderful stove, which will probably be brought out with a great flourish and offered for sale, is proved by his own figures to be totally unnecessary, every person being his own stove and warming apparatus, with a decided margin of power to spare. All this great discoverer needs now is to invent a method of utilising this spare heat for lighting, and we should then be both warmed and lighted by our own natural forces. Evidently the resources of nature are limitless, and the dreams of the most sanguine fade into insignificance before this, the greatest discovery the world has known. If he will perfect this I shall only be too pleased to negotiate with him for the English patent rights.

### INSTITUTION OF ELECTRICAL ENGINEERS.

A MEETING of the Institution of Electrical Engineers (Dublin section) was held on Friday evening in the Royal College of Science, Stephen's Green, Dublin.

Professor Barrett, F.R.S., presided at the opening. There was a good attendance.

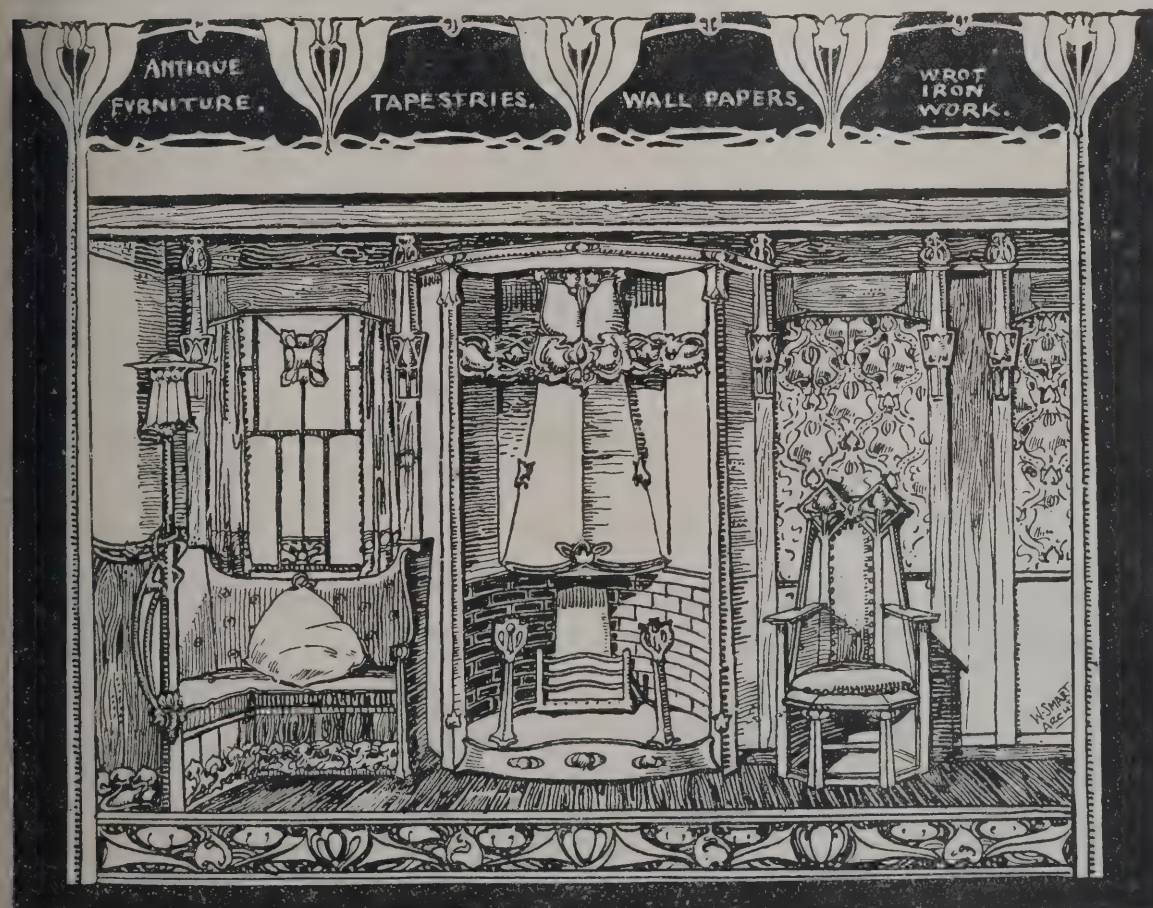
The honorary local secretary, Mr. Tatlow, said the local section now numbered sixty-one members. Since their last meeting they had lost their chairman, Mr. J. W. Towle, and their hon. sec., Mr. Frank Gill. Mr. Porte, their vice-chairman, had been elected chairman, and Professor W. E. Thrift, vice-chairman for the present session. Mr. John Irwin, secretary of the electric-light committee, entertained the members of the local section at the Pigeon House on September 27, when they viewed the progress of the works, and Mr. W. Brew explained the arrangement of the generating plant.

Professor Barrett said that few societies had in one session suffered so great a loss as the removal to London of their chairman and hon. secretary. They rejoiced that those gentlemen had been offered those high and responsible positions, and they were glad to think that to fill the positions of Chief Electrical Engineer of the Metropolitan Railway and of the

National Telephone Company, England had to come to Ireland to get what she wanted. In introducing to them his old friend and demonstrator, Mr. Porte, as the chairman for the coming session, he was sure they would hear from him an interesting and instructive address.

Mr. Arthur E. Porte then took the chair. He thanked his professional brethren for the honour conferred on him in placing him in the position of chairman of their section. They were aware that Mr. Towle had been elected to the position, but fortunately for him, and unfortunately for them, he was sought out by the promoters of the electrification of the London Metropolitan and District Underground System, and offered the leading position on that great undertaking, a position which he was bound to fill with great distinction, and he (the chairman) felt sure that Mr. Towle had the very best wishes of every member of the section. To give them some idea of the extent of the station Mr. Towle was about to erect in London, it would be ten times as large as the splendid generating station of the Dublin United Tram Company. In congratulating Mr. Towle on his appointment, they should also congratulate their colleague, Mr. Percy Sheardown, on being promoted to the position lately occupied by Mr. Towle. Mr. Sheardown was a young man for so responsible a position, and it was pleasant to think that the Board of his company had such confidence in his technical and administrative ability, and that they were able to promote from their own staff to the highest positions in the service. The Chairman then spoke in complimentary terms of Mr. Gill, who had been appointed chief engineer of the National Telephone Company. They all congratulated him on the appointment, and wished him success. They could not allow him to sever his connection with them without marking the occasion, and accordingly they arranged to present him with the piece of plate (a centre piece) which they saw before them. The Chairman then proceeded with his address, in which he dealt with the supply of electric energy for lighting and power. Their new lighting and power station in Dublin was approaching completion, and they trusted it would prove commercially possible to supply current for power purposes throughout the city at a price which would induce a large number of their manufacturers to employ electric driving in their works. He also dealt with recent progress in the design and manufacture of gas, and concluded the reading of his paper amid applause.

Mr. Gill then read notes on a hydro-electric phenomenon, after which



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The Chairman made the presentation to Mr. Gill, and he expressed their best wishes to Mr. and Mrs. Gill.

Professor Barrett in warm terms added his testimony to the services rendered to them by Mr. Gill, who, he said, had been an ideal hon secretary. When Mr. Gill accepted the position in London, Mr. Tatlow kindly took up the duties of hon secretary, and admirably had he discharged them. They also owed a debt of gratitude to Mrs. Gill and her lady friends for all they did to render attractive their social meetings. They trusted that Mr. and Mrs. Gill would long enjoy their new sphere of life and labour, and they wished them every happiness and prosperity.

Mr. Gill expressed his thanks for the presentation, and Mr. Tatlow acknowledged the friendly references made to himself. The proceedings then terminated.

### NATIONAL REGISTRATION OF PLUMBERS.

A LECTURE was delivered at the Manchester School of Technology on Wednesday last by Mr. J. A. Young, R.P., to a large and appreciative audience composed of registered plumbers, sanitary inspectors, students, apprentices and others interested in sanitary science and its advancement. The lecturer, who was introduced by the Chairman of the Manchester District Council for the National Registration of Plumbers, had taken for his subjects soil, waste and ventilating pipes, sanitary fittings, water supplies and their sources. By means of a powerful electric lantern and slides the various methods of jointing and fixing soil pipes were exhibited, and illustrations of bad and defective work, the features of which were pointed out, and the reasons why such methods were to be condemned. The lecturer went on to explain the evolution of the modern soil-pipe and the advantage of small over large ones—the necessity of ventilation to afford an egress of carbonic acid and other gases, and also to prevent syphonage of traps in connection with fittings.

The next item dealt with was waste-pipes. Various kinds of traps were thrown upon the screen, good, bad and indifferent, one illustration being the very common one some years ago of fixing a bell-trap to a scullery sink with the waste discharging into a "dipstone" trap constructed inside the house. The diameters of wastes for various purposes were touched upon, also the importance of easy bends when change

of direction became necessary, the expansion and contraction of pipes due to the passage of hot and cold water. Lead, heavy cast-iron, glass-enamelled cast-iron, galvanised cast-iron and zinc all received their due appreciation and the latter its just condemnation.

In speaking of the question of water supply, Mr. Young remarked that the risk of contamination at the present time was fortunately very much less than it used to be. A series of seven or eight slides were exhibited, indicating how easily water might be contaminated by improper connection and overflows and cleansing wastes to soil-pipes, by the old service-box, the stool-cock and other methods now recognised as highly dangerous. The pollution of wells by leakages from cesspools was next shown, sectional slides being employed to illustrate this. The qualities of a good drinking water were next introduced, it being shown what these were, and that although water from a chemical point of view may be a potable one, that a bacteriological examination was necessary, as a chemical test did not reveal the presence of bacteria which might be dangerous and deadly in their character.

In conclusion the lecturer said he regretted that the time at their disposal did not allow him to go more fully into the water question, and that his subjects had been perhaps too large to deal adequately with in a single lecture, and that his desire had been to place something of interest before all the members of his audience. He then thanked them for the genial welcome they had afforded him and for their courteous attention.

A hearty vote of thanks was proposed by the Chairman, who said it was very evident they had listened to a practical man, and that he himself had done so with great pleasure, and he hoped the audience had. This was seconded by a member of the audience, who testified to the skill and knowledge that had been exhibited in the lecture they had listened to.

Votes of thanks to the Chairman and Secretary concluded the proceedings.

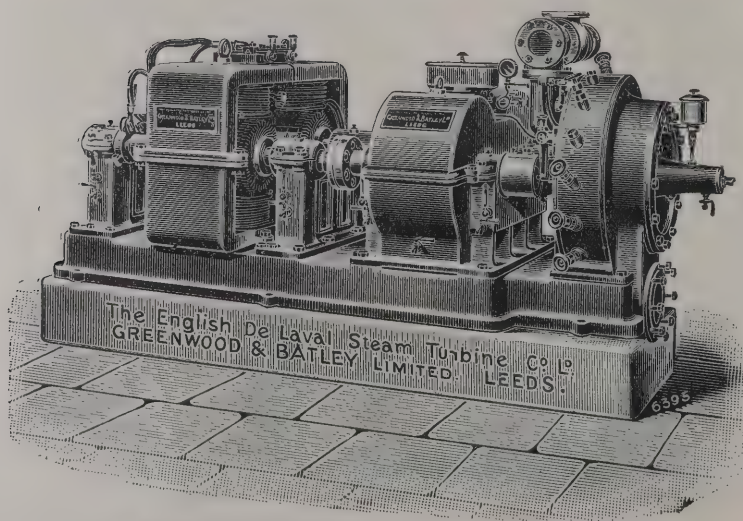
### WIDENING LONDON BRIDGE.

THE Corporation of London determined some time ago to widen London Bridge. The proposal caused much outcry, as it was considered little less than sacrilege to touch Rennie's Classic design. But although the simplicity of the structure will be somewhat sacrificed and there will be a loss in the severer beauty of the design, there will, it is maintained, be a gain in picturesqueness.

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The widening is being carried out, says the *Times*, under the direction of Mr. E. Cruttwell, M.Inst.C.E., as engineer, and Mr. Andrew Murray, F.R.I.B.A., as architect, the resident engineer being Mr. Cole. The work will be begun by building out corbels or cantilevers from the existing bridge. These granite brackets, as they may be described, will carry the new footways, and there will be at intervals refuges where standards for lights will be placed. By means of the hanging structures or galleries thus built out it will be possible to widen each footway from 9 feet 6 inches to 14 feet, and the roadway will also be widened by 2 feet 6 inches, bringing it up to 37 feet. To build out a substantial stone structure such as this entails some heavy work, and necessarily the existing footpaths must be blocked to traffic, though the roadway will be kept open. The engineers have therefore built out on each side of the bridge a temporary steel footbridge, which will also serve the important purpose of a gantry to carry the travelling cranes used for the work. Each of these temporary bridges consists of five spans, one 157 feet 7 inches and four 145 feet 5 inches. The spans run on each side alongside the permanent bridge, but are placed a few feet away from it for purposes of construction. The sides of the spans consist of lattice girders between which the passengers will walk, whilst the top booms of the girders will form a runway for the travelling cranes, by aid of which the new masonrywork will be put in place and the old granite parapet and pavement will be dismantled. The span girders are 12 feet 6 inches deep, and the rails upon which the cranes run are supported on timber placed on the top flanges of the girders. In order to protect passengers during the work an iron roofing covers the footpath, there being thus formed a covered way which will be much appreciated during wet weather. On each temporary bridge or gantry there are two 5-ton electric travelling cranes, and by them the blocks of stone for the new work can be lifted from barges in the stream below and set in place without interfering with the vehicular traffic or with the foot passengers in the covered galleries of the temporary bridges.

In order to avoid delay and to prevent obstruction through foundations in the river bed, a very ingenious method of supporting the spans, &c., has been devised. The piers of the main bridge have been utilised, and as they project laterally a very much smaller distance beyond the main structure than the distance at which the temporary bridges are placed, it is evident that the supports for the latter have, as they go down, to rake inwards towards the bridge. These struts or supports,

each about 25 feet long, are of steel, built up in the form of a box girder, and are placed in pairs. The piers project far enough for one support to be vertical, but the other has to be at a considerable angle from the upright. To support the lower ends of the struts large steel shoes, bedded in with concrete, are fitted to the upper surface of the granite piers. It will be evident that when any considerable weight is placed on the struts which form the piers of the temporary bridges—such as the erecting cranes, with their loads, and the passengers—the tendency would be for the whole mass to fall outwards, describing a segment of a circle of which the steel shoe on the pier would form the centre. In order to prevent this the two temporary bridges are attached to each other by ties, which pass through the roadway of the main bridge. There are two ties to each pier, and they consist of flat steel bars 12 inches by 1 inch. In this way attachment is made between the opposite piers, which thus form cantilevers. At the shore ends the temporary bridges are supported by timber trestles built up from the stairs leading down to the river. The spaces between the ends of the steel girders, where they rest on the cantilever piers, are filled up with timber so as to afford a continuous runway for the cranes.

The erection of the steel spans was a task of some difficulty, as it was not permitted to put false work in the river so as to obstruct the arches. The largest spans weighed 75 to 80 tons each, and these had to be raised bodily 30 feet to 35 feet and deposited on the piers. The contractors for the erection were Messrs. J. H. & W. Bell, of Liverpool, a firm which devotes itself to work of this nature. The general contractors for the whole work, it should be stated, are Messrs. Pethick Brothers, of Plymouth, whilst the contractors for the steelwork are the Patent Shaft and Axletree Company, of Wednesbury. The steel girders were put together on a large floating pontoon moored near the bridge. This pontoon was 113 feet long, 60 feet wide and 7 feet deep. To assist in building up the girders a track was laid from end to end on which a steam travelling crane ran. The steelwork was delivered on to the pontoon in sections of a size convenient for transportation from Wednesbury, and the parts were bolted together to form the spans. The pontoon was then placed athwart the arch against which the span had to be erected. It was very necessary that the pontoon should be held securely and steadily in the right position for depositing the span, and some remarkable ground tackle had to be used for moorings. The pontoon being in position the operation of raising the lengths of lattice girder-

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work was begun. For this purpose two sets of legs, or galleys frames, were erected on the pontoon at a convenient distance apart. Each one consisted of two balks of pitch pine 48 feet long, and in cross section 20 inches by 25 inches square. These uprights were connected at the top by a cross-piece to which the lifting tackle was attached. By means of steam winches on the pontoon the span was raised and deposited in position on cantilever piers. To remove the pontoon it was necessary to lower one of each pair of the timber balks, and this was made possible by pivoting them at the deck, much in the same way as the mast of a sailing barge. The transom pieces connecting the two balks had also to be up-ended.

It will be seen that the work was of some magnitude to be carried out on a floating platform, moored transversely to the run of the tide, but the difficulty of the operations was increased by the limited time allowed. The actual lifting of the spans occupied between fifteen and twenty minutes; the time required for taking the pontoon from its original position and back again was about three hours. In this work two of the powerful "Kaiser" tugs were employed, and a good deal of skilful watermanship, in which the Thames men are not surpassed by those of any other river in the world, was displayed. The time for fixing the ten spans was fifty-four days, the total weight dealt with being about 800 tons.

The whole work is an instance of the importance now attached to the continuity of traffic. If London Bridge could have been closed the work of widening would have been simple; but even if one footpath at the time had been appropriated, with perhaps a small part of the roadway, the need for the two temporary bridges would have been obviated. Again, had the contractors been allowed to obstruct the river, the need for speed in the erection of the spans would not have arisen—and speed in such work means expense. As it is, a novel piece of engineering work has been creditably carried out, and there will be no damming of the ceaseless streams of traffic that pass over and under London Bridge.

#### THE ABBEY CHURCH OF DORE.

THE Bishop of Hereford is strongly supporting an appeal for further subscriptions towards the repair of the freehold Cistercian abbey church of Dore. In a letter on the subject he

says:—"Both for its architectural beauty and for its historical associations the church of Abbey Dore may claim to take rank among the most interesting ecclesiastical buildings in England, and its preservation from ruin is consequently much more than a matter of merely local interest. Standing as it does in a lovely valley, it will well repay a visit from all who are interested in ecclesiastical architecture, and we shall be very grateful to every Churchman who, out of regard for the beautiful churches which form no mean part of our common inheritance, will give us some generous help in our effort to preserve it."

From a circular letter signed by the Archdeacon of Hereford and Prebendary Maddison Green, hon. secretaries, and the rector of Abbey Dore, the Rev. A. Phillips, it appears that the church had been for some years in a very bad state, and the condition of the roofs and floor was deplorable. Subscriptions and donations received have up to the present time been almost sufficient to cover the cost of relaying the old pavement, underpinning some of the buttresses, a complete system of drainage, and repair to the roofs of the presbytery and tower and to the parapet of the latter. These works have been in hand for some months, and are now nearing completion, while all further work for the present has been suspended. A sum of 2,000*l.* is now urgently needed to clear off a debt of about 150*l.* and to repair the roof and ceiling of the transepts, which are in a very dangerous condition, and for other minor structural repairs which will be necessary for the safety of the fabric. Up to the present time the funds subscribed have come largely from the county of Hereford and adjoining counties, about 1,700*l.* having been raised. Not only is it a very valuable and unique example of a Cistercian abbey church, but, having been preserved from ruin by Lord Scudamore in 1634, it also has a great many points of interest of this later date. In addition, many objects of interest and details of the planning, hitherto buried, have been brought to light, and the value of the building has been thus considerably increased. The work is being carried out by Messrs. Collins & Godfrey, of Tewkesbury, under the superintendence of the architect, Mr. Roland W. Paul, F.S.A., of London. In a few weeks time the work now in hand will be completed, and the committee earnestly hope that a sufficient sum may be obtained through the valuable medium of the Press, to obviate the necessity of stopping, even temporarily, the work of repair. Subscriptions and donations will be gladly received by the Lord Bishop of Hereford, the hon. secretaries, or the rector, Abbey Dore.



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# The Architect.

## THE WEEK.

SECTION 13 of the first schedule of the Workmen's Compensation Act says:—"Where any weekly payment has been continued for not less than six months the liability therefor may, on the application by or on behalf of the employer, be redeemed by the payment of a lump sum, to be settled, in default of agreement, by arbitration under this Act, and such lump sum may be ordered by the committee or arbitrator to be invested or otherwise applied." The amount to be paid as a lump sum is indeterminate, although it is understood that originally the sum was not to exceed 312 times the weekly payment. A case came before the Manchester County Court this week which reveals the difficulty of complying with the section. A workman who was injured obtained an award of 10s. weekly against the Lancashire and Yorkshire Railway Company. It was asked that the sum should be commuted. Judge PARRY said it seemed to have been held by county court judges that the court should discover the actuarial value of the weekly payment and assess that as the sum to be paid. He did not think that was the right view. The word "lump" was not a common word in statutory language, and it suggested the ascertaining of a reasonable sum, and not the making of a more or less scientific calculation. An injured man would be better with 50% or 100% in his pocket than with 10s. a week, which, if he was a young man, might have a large actuarial value. On the other hand, the master could have no great object in capitalising his payments at their real value, and it was at the master's option, and his only, that the redemption could take place. The section was very vague, but he thought it was intended to meet a case where an injured workman wanted to make a start in life in some new trade, and the employer desired to help him. Thereupon if they could not agree on a lump sum—one must not lose sight of the word "lump"—the arbitrator came in to help them to find out what was just. In this case he did not see there was any good reason for fixing a lump sum. The workman was content, and on the whole his Honour thought things might well remain as they were, for if he fixed any sum at all it would probably be a larger sum than the company would desire to pay. At present, therefore, he did not propose to take any steps under the section. He was glad the case had been brought forward, for unless he was directed by the Court of Appeal to discover the actuarial value in such cases, his view of the meaning of "a lump sum" would be that which he had just expressed. The case will no doubt be brought before a higher Court, and it is time some definite conclusion on the subject was obtained.

THE name Philadelphia is enough to suggest general honesty; for what is brotherly love, if it can coexist with shirking mutual obligations? In that city, however, there is marvellous success in evading the payment of water rates, and it may be other rates also. It has been found necessary to make special inspections. Last year 248,226 premises were visited. It was discovered that in 40,418 of them, or nearly 20 per cent., water was used without any rent being paid. The irregular—that is to say, the dishonest—appliances numbered 70,660. The water rent chargeable to these fixtures amounted to 146,057 dols. The cost of the inspection was 26,448 dols., showing a net revenue to the city of 119,609 dols. Each succeeding year the city will gain the gross amount. It was in Philadelphia the "Declaration of Rights" was signed, which was the first draft of the Charter of the United States. The document seems a mockery when so large a part of the citizens are indifferent to some of the primary obligations of men when they live together.

THE annual convention of the American Institute of Architects will begin in Washington on Wednesday next, and will be continued during the rest of the week. Most of the papers to be read will have a local application. "The Improvement of Washington" will be treated by Mr.

DANIEL H. BURNHAM, Mr. FREDERIC LAW OLNSTED, jun., and Mr. CHARLES MOORE. There will also be papers on allied subjects, viz. "The Organisation for Municipal Improvements," Mr. W. B. DE LAS CASAS; "The Modern City," Mr. ALBERT KELSEY; "Improvements in London, England," Mr. OWEN FLEMING; "Water Effects in Landscape as Applied in St. Louis Exposition," Mr. E. L. MASQUERAY. Captain J. S. SEWELL, U.S.A., will read a paper on "The Relations of the Architect and Engineer." There will also be exhibitions of drawings and photographs illustrating the proposed improvement of Washington by the Park Commission, and of the competitive drawings for the new Municipal Building, Washington. Mr. C. F. McKIM will preside at the meetings.

THE French Academy would now be able to alter the old saying about the want of reverence in the sapeur, for there is alarm in all sections of the Institut not only about the operations for the improvement of the Rue de Rennes, but also about the undermining by the Paris Metropolitan Railway. Nothing is sacred to the navy, not even the Palais Mazarin, which stands on the site of the Hôtel de Nesle, and for which LOUIS LEVAU prepared the designs, which were realised under the direction of LAMBERT and D'ORBAY. A memorial has been sent to the Minister of Public Instruction calling his attention to the situation. It is considered that the passing of trains beneath the parts of the buildings used by the officials and for ordinary meetings is likely to affect the solidity of the walls, and, moreover, the noise will be a hindrance to the proceedings. In such a case what can a minister do but endeavor to compromise? Paris wishes to equal other cities in possessing an underground railway, and in order to gain that end the inconvenience to a few scholars is likely to be overlooked or minimised.

THE letter from Mr. JOHN HONEYMAN, R.S.A., relating to the Glasgow sewage scheme, which, financially at least, must be considered a failure, becomes the more remarkable when we remember how long a time has elapsed since he first brought his ideas on the subject before the public. In 1858 Mr. HONEYMAN read a paper before the Architectural Society of Glasgow on "The Purification of the Clyde and the Ventilation of Drains." At the meeting he exhibited a full-size drawing of a substitute for the old syphon trap of which the defects were recognised. The new trap was made by Messrs. BROWN, of Paisley, and was tested in several of Mr. HONEYMAN's works. But he did not patent it, from a delicacy about using it if he stood in that position. The late Mr. BUCHAN made a slight alteration, which was not, however, an improvement, and it is now universally known as the Somerset trap. In PARKES'S "Hygiene" the trap is mentioned as the only double-eyed trap then existing. Mr. HONEYMAN has therefore a claim to be heard on the subject of the drainage of Glasgow, and his condemnation of the action of the committee of the Corporation should be seriously considered by the people of that highly-taxed city.

ALTHOUGH in the Dublin Corporation much is said about economy, it is not always promoted in the most effectual manner. There is, for instance, an Englishman, Mr. H. H. HELLINS, who is resident engineer for the main drainage works, which are of so difficult a nature they were delayed for over thirty years. That he is an efficient officer is evident from the admission that he saved the people of Dublin about 15,000*l.* in the course of six months. For so responsible an office, and which must be considered as no more than temporary, a salary of 500*l.* a year is not exorbitant. Mr. HELLINS asked for an increase which would bring up his salary to that amount. On the plea that the Corporation is over-engineered, the members refused to agree to the request. It would not even be agreed to that any rise in the engineer's salary was desirable. Compared with other towns, the engineering staff of Dublin is arranged on an economical basis, but the true cause of the opposition is, we suppose, the nationality of Mr. HELLINS.





PAINTERS' ARCHITECTURE: BENOZZO GOZZOLI.

## PAUL BAUDRY'S LETTERS.

AMONG the French painters of the latter half of the nineteenth century there was not one who stood higher in the affections of his brethren than PAUL BAUDRY. A stranger who met him for the first time would be able to realise the reasons why men were attracted towards him. The impression he made was one of trustworthiness. His countenance, his bearing, his conversation gave the conviction that BAUDRY would be true to his principles regardless of the cost to himself, and that promises would be realised however much he might have to suffer. He was below the average height of his countrymen, but the manliness of his expression made one regardless of feet and inches, and it seemed as if RODIN'S bust in bronze was a more fitting representation of him than any portrait in oils. A native of Roche-sur-Yon he was a typical Vendean in whom loyalty was predominant.

The life of PAUL BAUDRY has engaged many pens, and those in quest of information about the painter will find what they desire in the volume which M. CHARLES EPHRUSSI has devoted to his friend. He exemplified the facilities which are offered in France to students of the humblest classes for their development when they are endowed with ability. He was the son of a *sabotier* who was also a musician, and his ambition was to see PAUL earning his living as a violinist. From nine to thirteen he went resolutely through monotonous exercises without his enthusiasm being excited. Then he was permitted to turn his attention to drawing. In remote towns artists who once dreamed of glory in Paris are sometimes glad to find a retreat, and fortunately for BAUDRY there was one of them in Roche-sur-Yon. His name was SARTORIS, and he had been a pupil of ABEL DE PUJOL.

He realised the lad's power, and endeavoured to secure a more successful career than his own for PAUL BAUDRY. He was able to persuade the local authorities—which is never a difficult task with a provincial maire or préfet—about their duty to aid so promising a youth. In 1844 the youth, who had not fully attained his sixteenth year, was despatched to Paris in order to win more glory for La Vendée. Like so many art students of those days, he began the campaign in DROLLING'S studio.

Students of art in Paris are allowed to play many pranks on each other, but they have a regard for the renown of their atelier, and when they see a promising comrade he is allowed to pursue the even tenor of whatever way he believes will lead to the goal, with its Prix de Rome. Those in DROLLING'S studio must have imagined, when BAUDRY did not carry off everything at the first attack, that the judges were jealous. After three years he won the second grand prix, then for two years in succession he failed, and it was not until 1850 that he attained the coveted prize. The subject that year was *Fishermen discovering*

*Zenobia, Queen of Samyria*, and BAUDRY'S work revealed academic influence, but at the same time he endeavoured to realise the scene as an actual incident. There was also a variety in the colouring which was unusual.

A new life then began for the artist of twenty-two, and by his aid we are enabled to have glimpses of it. One of his chums in DROLLING'S atelier was CHARLES MARIONNEAU, who has since adopted other pursuits, and is now a correspondent of the French Institut. He was a native of Bordeaux, and was blessed with a hearty southern temperament. To him BAUDRY revealed all his aspirations, and he began writing to him as soon as he won the Prix de Rome. The correspondence was continued for several years. The letters were entrusted to M. PAUL BONNEFON, and a selection from them has appeared in some numbers of *L'Art*. They form one of the most attractive records of artistic life which exist.

In 1850 the form of government was uncertain in France. LOUIS NAPOLEON was nominally head of a Republic, but few believed he would long accept that position. Old DROLLING at the dinner he gave to his prizemen proposed, "in a voice solemn and sombre," the simple toast, "A la République!" But BAUDRY had too important a task before him to allow himself to be led aside by politics. He left for Rome at the end of the year. There he devoted himself to study. But the news of the coup d'état alarmed him for the sake of friends. He implored MARIONNEAU never to expose himself to danger for the sake of a political idea. The world then appeared to him, as to Dr. PANGLOSS, as the best that was possible, and for an eager student the Villa de Médicis was an Elysium. But it was not long before he felt the need of money, in order to derive all the profit that was attainable from his sojourn. "I am lodged as a prince, that is to say, in a palace. I am fed like a cardinal, but there are holes in my hat." It was impossible to make ends meet on 75 francs a month, and to visit Venice, Naples and other parts of Italy would require 1,000 francs a year. BAUDRY was, however, soon relieved, for the Vendéans continued the subsidy, and, indeed, increased it from 600 francs to 1,300 francs.

He lost no time in travelling to Florence, not directly, but sometimes in diligence, sometimes on foot, in order to see as much of Italy as he desired. Among others in Florence were, at that time, LOUVET and LEROUTEUX, architectural prizemen, and BOUGUEREAU, now universally known by his paintings. BOULANGER had gone to Naples. At Florence he paid two pauli, or about 10s., a day for his chamber. His ambition was inflamed by the works of the masters. "I was thinking yesterday on leaving a gallery," he wrote to his parents, "about the glory and fortune which an artist can attain by means of a piece of canvas of a few feet square and some paint. Nothing more—a canvas



and an idea. And when the idea is grand, your name, however obscure, is grand and puissant as that of an emperor; even if you were only the son of a labourer like RAPHAEL, or the son of a woman who sold vegetables like EURIPIDES, one of the greatest poets of antiquity." Afterwards BAUDRY had to go through a process of disillusionising, and his notions about fame were modified. Then he recalled how little after all was known about the great masters. VASARI collected only a few anecdotes, and to some artists he was indifferent. After BAUDRY had completed his work in the Paris Opera House, what he sought was repose, not glory.

Before he returned to the Villa Médicis he had studied in Florence, Venice, Modena, Parma, Milan, Mantua, Padua, besides smaller places. He was glad to settle down to work in a fixed domicile. He contemplated painting two subjects, viz. the *Contest of Jacob with the Angel* and *Fortune with the Child who Slept on the Edge of a Well*. The second subject was suggested by LA FONTAINE, for whom BAUDRY had a true Frenchman's idolatry. Indeed, the fabulist became, as it were, a guide to him as a painter. He said afterwards, "It is with LA FONTAINE, with that charming spirit at once so natural and so Gallic, that I have toddled towards CORREGGIO, TITIAN and LEONARDO DA VINCI. I have not had the pretension to create; I am happy if I am able to remember." He toiled at the two paintings like a galley-slave.

He next made a journey to Naples. EDMOND ABOUT somewhere gives a delightful description of his meeting with the solitary "Little PAUL" in Pompeii, where the young painter seemed to be as happy as if he were in conversation with the old artists who had adorned it. ABOUT was a cynic, with an ambition to make literature a stepping-stone to political power, and he treated many subjects as if he were an epigrammatic statesman. Like the Englishman, he cared for nobody, and nobody cared for him. But there was one exception, PAUL BAUDRY, and the little affection he possessed he was always ready to bestow on him. About the time we mention the painter may have found a solace in Pompeii. The pictures he sent to Paris were subjected to the usual comments which are inevitable with contributions from the Villa Médicis. He was pained, but resolved to overcome the critics. Consequently he increased his ardour for study, and he spared no trouble to discover the causes of the success of the foremost Italians. His style was transformed. It was no longer suggestive of the fierce Gallic invader, but of the polished artist who avoided everything which might be taken as unrefined. He was not the first who was conquered by Italy, the enchantress.

We cannot follow all the stages of his career. It was recognised that he was a master of decoration who could infuse life into VESPER, AURORA, PHEBUS, and make the hours and seasons something more than abstractions. Commissions came to him from many quarters. For the Hôtel Galliera he represented the cities of Italy by typical figures which, at his desire, were published in *The Architect*. Prix de Rome men are loyal, and when CHARLES GARNIER obtained the commission for the Opera House he secured the most important part of the painted decoration for PAUL BAUDRY. It might be imagined that the painter had never executed any work except of cabinet size. He began a special course of education. BAUDRY spent the winter of 1867-68 in drawing from photographs of RAPHAEL's cartoons, and in the summer he came to London in order to colour his copies. Then he went to Spain to study the style of VELASQUEZ. He returned to Rome to renew his acquaintance with MICHEL ANGELO and RAPHAEL, some of whose works he had already copied. A visit to Venice followed. In spite of all his labour, perhaps on account of it, inspiration was coy. "I have eight large figures to invent and three great paintings for the *soffitti*. When are the visions of them to arrive? I cannot tell, and I dare not return to Paris until I have seized and fixed them on blue grounds like naturalists with butterflies." In his despondency, however, he had one consolation, for his brother, over whose education as an architect he had watched, had just obtained the first medal of the Salon for two architectural designs.

His friend MARIONNEAU knew that BAUDRY was likely to forget his own interests in so costly a method of study,

and seems to have remonstrated with him. The painter tells him how the account stands. He had finished twenty-two canvases for the Opera House. In order to complete the enterprise he went to Italy. At his own cost and without any subvention from the State he had painted three large ceiling pictures, one measuring 13 metres, or over 40 feet, and eight colossal Muses for the voussours between each painting. If he seemed to have deserted the Salon it was through devotion to the "grande peinture" with which so few artists occupied themselves, for success, and often fortune, are more likely to be assured by a small picture. In return he had the satisfaction of knowing that if glory arrived to him it was purchased by an entire neglect of profit. He made no solicitation, although he was elected a member of the Académie des Beaux-Arts, and he said his success was more owing to his paintings in the Hôtel Paiva than to those in the Opera House. BAUDRY was growing indifferent to renown, and he said he often implored the most brilliant journalists of Paris not to bore the public with "ma minuscule personne."

The outbreak of the war disarranged all his plans. When order was restored he resumed operations. To carry out some of the vast paintings he was obliged to use a loft at an inaccessible height in the Opera House. He was grateful to THIERS for his efforts, by which work of that kind was practicable, and as a testimony he presented the old statesman, who was as minuscule as BAUDRY himself, with the copies of RAPHAEL's cartoons he had completed in London. The paintings at the Opera House, with so conscientious an artist, never seemed to approach completion. It was in vain BAUDRY declined commissions or put prohibitive prices on portraits, with the resolution to sacrifice all his time to the work on which he had most relied to uphold the Vendean reputation for art. The canvases still demanded increased toil. At first he was assigned a part of the series, but he doubled the quantity without any increase of price. At length the end was in view, and then he found himself to be nervous and harassed, seeking only repose, cordials and covering, for the winter in the loft seemed to be Polar. He decided on exhibiting the paintings in the Ecole des Beaux-Arts for the benefit of a society for succouring painters. If there was any excess he proposed to ask a small share towards an asylum in his native place and for another artists' society. It is satisfactory to know that the exhibition was successful.

Free from his gigantic contract, BAUDRY was able to travel in Egypt and Greece with his brother, the architect. But his journeys made him prize France more than formerly, and especially the western parts. He was asked to design the diploma of the Universal Exhibition of 1878, of which a reproduction was printed in this Journal. Another national work was offered to him which was suitable to turn all his powers in a new direction. He was invited to paint the walls of the Panthéon with scenes from the life of JOAN OF ARC. His enthusiasm was renewed, and he was prepared to devote himself to it with as much indifference to his pecuniary interests as when he undertook the Opera decoration. To the end of his life it was his fondest dream. There were, however, material cares which were an obstacle to its realisation. He had to take up private commissions, but with all his productive power BAUDRY never allowed the supply of his works to equal the demand. He was the last representative of the connection between the Italian and French Renaissance; we might even say that in his works the identity of the two is accomplished. The explanation is to be found in one of his letters, where he says, "I live always as a student," and that was not only amidst surroundings that were poverty-stricken, but in thought, for he never ceased to look up to the Italians as if they were lawgivers who could have no modern rivals. If he had to grapple with the history of the peasant girl he might forget CORREGGIO, and France would have gained much. But his life will always be a reminder of a devotion to art which was sublime, and the letters in *L'Art* reveal that with all his labour he continued to be as cheerful and kindly disposed as old LA FONTAINE.

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New Board Schools have been erected at Wigginton, Yorks, from the designs of Mr. W. H. Brierley, architect to the School Board.



## ENGLISH RENAISSANCE WOODWORK.\*

THE adaptability of wood for building was suggested by the ancient and general belief about the Greek temple originating in a timber hut. At a later time an example was given of what might be called the same human instinct when Sir JAMES HALL explained to the Royal Society of Edinburgh that the great Gothic churches were derived from the rustic dwellings of the north, and demonstrated how by driving posts into the ground and by tying willow rods to them a true Gothic arcade was formed. The theory was made memorable through its adoption by Sir WALTER SCOTT, who, as a master of woodcraft, was favourable to everything which increased the interest of trees.

There was one excuse for any extravagance of speculation about the relative merits of wood and stone as building materials, in the circumstance that neither could be supposed to have evolved a special style of construction or of ornament. Nor can it be said that in modern times with all our striving after originality we are much more successful than the builders of former ages. The delicate wood-carving of the French was imitated among us in a patented cement composition in the eighteenth century, and is now reproduced with the utmost fidelity in cast-iron. Indeed, it is common to see in a room the same old Roman ornament in a variety of materials, tiles, plaster, wood and metal. If we possessed a complete series of ancient Norwegian and Icelandic timber houses we might then observe an approach to a style that was emphatically dictated by the material. The master's high seat in the *skali*, or state-room, was said to be flanked by ornamental pillars or columns. There was carving in which dragons, or ling-worms, and other imaginary beings were elements, and scrollwork abounded. It would appear as if the stone carving, and sometimes the metalwork of the Northerners were derived from older examples in wood. We may also suppose that the early timber dwellings in Normandy and Brittany, as well as in England, must have had features which were likely to be traceable to the same source.

The examples shown in Mr. TANNER'S "English Interior Woodwork" are suggestive of the South rather than of the North. In the sixteenth century England was beginning to feel some of the influence of the Renaissance. The Classic style, however, suffered a "sea change" in transmission, and the details of English joinery will not sustain a comparison with those of the beautiful varieties of woodwork which are to be found in Italy. But at least in the examples selected by Mr. TANNER we must acknowledge there has been a restraint which did not allow of the extravagance which is supposed to characterise much of our Renaissance work.

The designers were obliged to fill their spaces with panelling. It will be observed in the plates now published that in arranging the panels right-angled forms were generally employed. Occasionally there are diamond-shaped examples and a few with arched heads, but it is rare to find an elliptical panel. Variety was obtained in the squares and rectangles by means of mouldings. They were not always easy to "run" in those days, but it is evident from many examples that it was realised that wood-working differed from stone-cutting by the facilities offered for having many mouldings in a limited space. The framing of the panels gave opportunities for introducing carved ornament instead of moulding, and then, as now, the egg and tongue appeared to find most favour.

In employing columns the Tuscan was the favourite, and it was often made the subject of a free treatment which must be admired. Next came the Corinthian. The Ionic was rarely utilised, and we see on those occasions the volutes, which are characterless if judged by Greek types, relegated to newels, balustrades, or terminals. Few figures are to be seen among the examples. A great deal of conventional ornament was in vogue at one time, and towards the close of the period illustrated GRINLING GIBBONS brought imitation to a perfection, or it may be to an excess, which was never surpassed. As WALPOLE said,

"There is no instance of a man before GIBBONS who gave to wood the loose and airy lightness of flowers, and chained together the various productions of the elements with a free disorder natural to each species." But disorder, although it may have its use, is out of place in architectural decoration.

The plates begin with two sixteenth-century screens from the Charterhouse, London, which are ornamented almost to excess. They are of the class in which "bits" of various kinds were used, probably without any definite plan of the whole. A fireplace from Ipswich is remarkable as belonging to a private house, but in detail it is also fragmentary, and we are told "the carved panels on the frieze are rather barbaric, and do not compare favourably with the more delicate design in the frieze to the panelling round the room." The judgment suggests that Mr. TANNER is not blindly idolatrous about his subjects. The entrance-hall of Hardwick has simple panels with a balustrade to the gallery, in which graceful vase-like forms are introduced. Some examples of staircases fill a separate plate. The panelling in the library of Merton College gains interest from age and position. But a little more variety would have been desirable, although it would have imposed additional labour on the artificers. Two examples from the South Kensington Museum show a combination of English and Italian treatment. A porch from a drawing-room, Broughton Castle, is interesting, and the object of it was, we suppose, to afford a means to display the armorial bearings of the owners.

Haddon Hall is always likely to be utilised as an example of English work. WALPOLE, in describing similar mansions, said:—"The apartments are lofty and enormous, and they knew not how to furnish them. Pictures, had they had good ones, would be lost in chambers of such height; tapestry, their chief movable, was not perfect enough to be real magnificence." In the drawing-room of Haddon Hall the panelling was only employed in the parts where there was no tapestry. All visitors to Hatfield House may not have observed in the long gallery that "unfortunately the panels to the great shelf are only painted on, which is inclined to give the whole composition a tawdry appearance."

Knole House is a peculiarly interesting subject, for besides early seventeenth-century work there is in the "Ambassadors' Room" an example of INIGO JONES'S treatment. There are a broken pediment, Italian borders of several kinds, Ionic pilasters, &c. Without the name of the designer, the elegance of the style would demand attention. As an example of florid Italian the staircase of Thorpe Hall, by JOHN WEBB, the pupil of INIGO JONES, is not easily matched. The only modern examples which resemble it are castings. There are other parts of the mansion illustrated which suggest the competency of WEBB to continue his master's style. WREN'S organ-case from Pembroke College does not express so well the Italian manner. His woodwork in the church of St. Lawrence Jewry, St. Stephen's, Walbrook, and Trinity College, Cambridge, Hampton Court, and Chelsea Hospital is far superior. It is evident also that GIBBONS co-operated with him, and the flowers and fruit are almost enough to compel an æsthetician to wish that so much naturalism was legitimate decoration. The ornament taken from Farnham Castle, if not by GIBBONS, was likely to have been executed by one of his assistants, for the swags have a similar abundance of fruits. The effort to combine horizontal and raking lines on the balusters is curious, but not entirely successful. There are enough balusters on the last page to be taken as models. Those from Burford Priory of a wavy pattern are light and sufficient to express that they form a screen, and, as they serve no constructive end, do not need to be massive.

The collection in Mr. TANNER'S volume is sufficient to suggest the English efforts to express Renaissance ideas in one division of building where utility and decoration are combined. The plates provide for a necessity in practice, as there is no book which brings together so many related examples, or is equally suggestive of the efforts made during a couple of centuries to deal with the same problems. By means of the work much time will be spared in hunting out examples for designs. The drawings are all to scale, with the exception of small sketches to indicate the

\* *English Interior Woodwork of the XVI., XVII. and XVIII. Centuries*: a Series of the best and most characteristic Examples of Chimney-pieces, Panelling, Staircases, Doors, Screens, &c. Measured and Drawn with Introductory and Descriptive Text. By Henry Tanner, jun., A.R.I.B.A. (London: B. T. Batsford.)



general effect, and can therefore be utilised without difficulty. For the purposes of study the plates can be taken in the order they are given, but for application the reverse course may be adopted with advantage, for JONES, WEBB and WREN had mastered the essential spirit of the Renaissance, and were more at ease in applying it than their predecessors.

### BRITISH SCHOOL AT ROME.

ON Saturday last a meeting of the committee and subscribers to the British School at Rome was held in the rooms of the Royal Asiatic Society.

The chairman (Professor Pelham) said that the School had hitherto lived under provisional conditions and a provisional government, which were to give way to a more permanent state of things. They all felt regret at the death of Mr. Spring-Rice, who as chairman of the committee had rendered great services both as a scholar and as a financier. Mr. Spring-Rice had died in the midst of a career of eminent public work, from which he had found time to help the endeavours in which they were engaged. He moved the first resolution, which was seconded and carried, "That all subscribers present who are not members of the general committee be added to the general committee."

The hon. secretary (Mr. William Loring) then read the report for the session 1901-2, in which it was said that the School was formally opened by Lord Currie, His Majesty's Ambassador to the Quirinal, on April 11, 1901. It had now terminated the first complete session of its existence as a working institution, and on the whole the results achieved were satisfactory. The Italian Ministry of Public Instruction extended to the students all the facilities which it was accustomed to grant to members of such institutions, and the official introduction to the authorities of the Vatican library had been effected through the kind offices of Cardinal Vaughan. With the other foreign Schools in Rome relations were of the most friendly nature. Special mention should be made of the kindness of Mgr. Duchesne, director of the French School, who secured for the School, from the French Minister of Public Instruction, a most valuable gift in the publications of the French schools both at Athens and at Rome. The committee also desired to express their appreciation of the assistance rendered to it by Lord Currie and the staff of the British Embassy, one of whom (Sir Rennell Rodd) had consented to join the committee. At the instance of the British Consul, Mr. Morgan, an informal conference was held at the Consulate in April last between representatives of the British School, of the Anglo-American Archaeological Society and of the British Academy of Arts, and it was hoped that with the British Academy of Arts, at any rate, some definite plan of co-operation might be framed. The rooms leased for the School in the Odescalchi Palace had proved to be well adapted for the purpose, but much remained to be done in the way of providing fittings and furniture. The committee had to acknowledge very gratefully the numerous gifts of books already received. Dr. Steele's munificent donation of books and bookcases was mentioned in the report issued to subscribers last January, as also were the grants made by the Universities of Oxford and Cambridge, and by the publishing firms of Messrs. Longman, Murray, Macmillan, Rivington, Methuen and Bell. Among the more valuable books presented by individual donors were the "Corpus Inscriptionum Latinarum," given by the Rev. S. A. Thompson-Yates; Forcella's "Iscrizioni delle Chiese di Roma" and Frazer's "Pausanias," by Mr. J. D. Paul; Eckhel's "Doctrina Numerum," by Mrs. Oldfield; a set of the publications of the Accademia dei Lincei (since 1898), by Dr. Thomas Hodgkin, and of the "Journal of Hellenic Studies" (since 1888), by Mr. J. C. Bailey. A copy of Duchesne's edition of the "Liber Pontificalis" had also been promised by the Rev. A. C. Headlam. The committee had also to thank the Palæographical Society for presenting the entire series of their publications. Thanks chiefly to these benefactions, the library now contained upwards of 1,000 volumes. The School opened with two students. One of these, Mr. Thomas Ashby, of Christ Church, Oxford, sometime Craven Fellow of the University, had continued to devote himself to the topographical researches in Rome and the Campagna, which had won for him a name; the other, Mr. Cuthbert Blakiston, also of Christ Church, and at present Craven Fellow, was occupied with the study of the architecture of the fourth century A.D. In addition to these two students, two others had been more recently admitted, Mr. Bernard Webb, who was sent out by the Institute of British Architects, and Mr. Peter S. McIntyre, who held a studentship from the University of St. Andrews for palæographical studies. The best evidence of the work accomplished by the School was supplied by the volume of "Papers of the British School at Rome," recently published.

Of the two monographs contained in the volume, that by the director (Mr. Rushforth) on Santa Maria Antiqua, was the only adequate account of the church as yet published, and was of great interest and importance. Mr. Ashby's paper was an excellent illustration of the work still being done, and to be done, in the Campagna Romana. The committee could not turn to the financial aspect of the affairs of the School without expressing their sense of the severe loss which it had suffered by the death of Mr. Stephen Spring-Rice, the hon. treasurer of the School. The audited accounts covered the period from October 1, 1901, to July 31, 1902. The receipts in the subscription account amounted to 478*l.*, and the expenditure was 536*l.*, showing a deficiency on this account of 58*l.* The donations amounted to 113*l.* It was obvious that strenuous efforts were still needed to put the School on a firm financial footing. The comparatively favourable results of the ten months' working were largely due to the subscriptions of colleges and other public bodies, which were only promised for short terms of years, and death had already begun to make itself felt among the individual subscribers. The committee were of opinion that the time had come when the constitution of the School should be placed on a more definite footing than had been the case hitherto. New rules had been modelled on those in force for the British School at Athens, with such modifications as the different circumstances of the two schools appeared to require. The general committee, having served its purpose, would be invited to vote its own dissolution, and the newly-constituted committee would report annually to the subscribers, as in the analogous case of the British School at Athens, with which it was hoped that the Roman School might ultimately establish an even closer connection than had yet been possible.

The Chairman said that it was clear that good work had been done, and he read an extract from a letter which he had received from Professor William Ramsay, of Aberdeen, who wrote that he thought very highly of the School's annual, which disclosed a unity, plan, order and purpose of which there was too often reason to regret the absence.

Mr. Mackail, in moving the second resolution, "That the report of the executive committee be adopted and that the rules submitted by them be confirmed," insisted that if the work was to be adequately done the directors of the School should be well paid; and, indeed, on such a sphere of operation two directors were really needed—one to preside over the department of ancient art and history, and the other over that of the Middle Ages.

Dr. Charles Waldstein, in seconding the resolution, observed that the continuity of history from ancient times and throughout the Middle Ages was better realised in Rome than on any other spot; and the Renaissance really centred in Rome. It was to be hoped that as there was already a student sent by the Institute of British Architects the full co-operation of that body and also of the Royal Academy would be secured.

This resolution having been carried,

Mrs. Strong moved the third, "That the general committee be dissolved," and expressed the belief that valuable results would be obtained from the papers issued by the School, which might in time rival those obtained by French and German scholars. The experience gained by our School at Athens would be of great value, and she ventured to think that many fine works of art in Rome, hitherto supposed to be copies, would turn out to be originals.

The resolution was seconded by Mr. A. H. Smith, and carried.

The last resolution, proposed by Mr. Hogarth and seconded by Mr. Hill, "That the President of Trinity College, Oxford, be elected chairman under Rule IX. (1); and that the following be elected members of the committee under Rule IX. (2):—Professor J. S. Reid, Dr. G. W. Prothero, Dr. C. Waldstein, Sir Rennell Rodd, Mr. A. B. Cook, Mr. F. Haverfield, Mr. W. Loring, Mr. G. A. Macmillan, Mr. A. H. Smith; that his Excellency Lord Currie, Dr. Thomas Hodgkin, and the Dean of Westminster be appointed trustees under Rule XXVIII.; and that Mr. Edwin Waterhouse be appointed auditor for the current financial year," was also carried.

### GLASGOW SEWAGE SCHEME.

THE following letter to the *Glasgow Herald* from Mr. John Honeynan, R.S.A., relates to the scheme which is now under consideration for dealing with the sewage of the city:—

The demand of the sewage committee for another million for the completion, or rather towards the completion, of their gigantic sewage scheme has aroused an amount of interest throughout the community which might have been evoked much more profitably six years ago, when it was still possible to prevent the Town Council from incurring such an enormous expenditure for such a trifling return. Even now it may be worth considering what sort of return we may reasonably hope for.



When the committee decided to ask power to borrow one million instead of the more modest sum recommended by their sub-committee, they gave as their only reason that this would allow the works on the south side of the river to be proceeded with at once, so that the great object of the undertaking—the purification of the Clyde—might the sooner be effected.

Now, assuming the purification of the Clyde to be the only outcome of this enormous outlay—the limit of which we have not yet nearly reached—it will naturally occur to most people who now see their direct interest in the matter, to ask, Is the purification, or the partial purification, of the Clyde in its course through Glasgow worth paying, say, 2,500,000*l.* for? This question, of course, ought to have been asked before; but even if it had been answered in the affirmative, and the citizens had agreed at least to spend, say, 1,000,000*l.* on the undertaking, they may well be excused if they feel both surprise and indignation when told that they have been committed to pay double that amount without their knowledge or sanction.

The frustration of Sir Samuel Chisholm's scheme, involving a cost of 750,000*l.*, was hailed with satisfaction by prudent citizens; but even that was quite a different affair from this. If prudently managed the 750,000*l.* would have yielded at least enough to cover the interest, and might possibly have resulted in profit; but the two millions, on the contrary, can result in nothing but dead loss from beginning to end; they must simply be a perpetual burden on the community, necessarily involving another, grievous to be borne, in the shape of annual upkeep and working expenses. And for what? I again ask. For a mere æsthetic fancy, a thing which not one-fiftieth part of the population will be able to appreciate, or, indeed, know anything about, and which will be of no material advantage to anyone. No one probably will venture to deny that to burden a city with a debt of over two millions sterling to obtain for an insignificant fraction of the population a hypothetical benefit so intangible must be regarded as at once absurdly extravagant and extravagantly absurd.

It may perhaps be urged that the proposed change will affect beneficially the health of the city, but there are good grounds for believing that that is merely a fond delusion. The idea that the river as it is is a source of danger to the health of the city was long ago demonstrated to be false. More than forty years ago, during one of those periodical scares which induced our Town Council to spend many thousands of pounds on reports by eminent engineers, a well-known Glasgow architect, in a paper which was published at the time, called attention to the fact that when the vital statistics of districts having the same class of inhabitants were compared it was found that the death-rate in the districts nearest the river was invariably lower than in those further removed from it. More recently, the careful observations regarding the purity of the air in different parts of the city under the direction of the late Dr. Angus Smith, explained this circumstance by proving that the purest air was found to be under Glasgow Bridge, and the next purest at the harbour, near the Sailors' Home. If anything else was needed to clear the much-maligned river it will be found in the declaration of Sir William Gairdner, in the course of the discussion on Dr. Smith's paper, that "it was impossible to prove that the impurity of the Clyde was a cause of disease or death."

It would thus appear that we cannot regard this huge sewage scheme as a sanitary measure. There is, indeed, some reason to fear that its effect may ultimately prove to be of an opposite character. This appears to have been the view of the President of the Architectural and Engineering Section of the Aberdeen Congress of the Royal Institute of Public Health, who, in his opening address, referring to this point, says that unless special measures are taken to prevent it, "it may prove to be not beneficial but detrimental to the health of the community." Also that "the effect of the change will merely be to substitute the great intercepting sewer for the river as an outfall for the lateral sewers, and it may be doubted if this substitution will be a sanitary improvement, for it seems evident that the open air and sunshine over the broad surface of the river is much more favourable for the development and attenuation of noxious germs than the comparatively close and damp atmosphere of a subterranean sewer."

In view of these facts, the miserable attempt of the sewage committee to account for the extraordinary discrepancy between the estimate of cost and the amount actually spent up to date, and the uncertainty which naturally prevails as to the discredited committee's estimate of future expenditure and the sufficiency of the proposed loan, Mr. W. F. Anderson's proposal to delay operations on the south side in the meantime appears to have much to recommend it. This course would have many obvious advantages, chiefly:—(1) The experience gained in the construction and working of the western section might be turned to good account; (2) the committee would have plenty of time to get reliable estimates of the cost of the southern works; and (3) it would still remain an open question whether the work on the south side should be carried out as designed, modified or abandoned.

The sum now asked for may be sufficient to complete the entire scheme, but we cannot be certain of that till the western section is completed and in working order. If, when that is done, a sufficient amount remains to complete the work on the south side, good and well; but I think it exceedingly unlikely that the citizens of Glasgow will submit to further taxation, during this generation at least, for the completion of a scheme so extravagant and unproductive.

## EDINBURGH ARCHITECTURAL ASSOCIATION.

A MEETING of this Association was held in the rooms, 117 George Street, on the 26th ult., Mr. A. Hunter Crawford, the president, in the chair. After some formal business the President read a paper on "The Heating of Buildings by Steam Vapour." He discussed the warming more particularly of domestic buildings, pointing out the following disadvantages in the usual system adopted with the low-pressure hot-water system which, while excellent in many ways, was unsightly:—(1) The large size of pipes and radiators which it required; (2) its cost; and (3) its liability to be injured by frost. Attention was drawn to the method of heating commonly adopted in Germany. This was distinct in many of its important details from the low-pressure system largely used in America, and recently adopted somewhat freely in this country. The principal points in the former system were the working of the steam boiler at a pressure of only half-pound per square inch, the complete automatic control of this pressure, the entire absence of air-valves on the radiators, the use of only one valve for admission of steam to the radiators, and the fact that this valve could be opened to any extent desired, giving complete control of the amount of heat given off by the radiator. The attention of heating engineers was specially drawn to the system because of its extreme simplicity in working, its security from injury by frost, its easy control, and its suitability for placing in houses in a way so as not to be at all an eyesore. Mr. Crawford illustrated by sketches the details of the apparatus, and at the close he was awarded a cordial vote of thanks.

## CLASSICAL ASSOCIATION.

THE first general meeting of the Classical Association of Scotland was held in Edinburgh on Saturday, under the presidency of Professor G. G. Ramsay, LL.D.

Professor Baldwin Brown read a paper on "Some Archaeological Aids to Classical Study." He displayed a number of photographs of ruins and statuary, drawings of coins and various maps and diagrams illustrative of ancient Greece and Rome, and pointed out how these might be used to give a living interest to the literary studies of the pupils. Combined with archaeology Classical studies would develop upon lines that would render still more potent for good their humanising and elevating tendency; faculties left untrained by a purely literary education would be developed, and a substantial concession would be made to the scientific spirit by incorporating upon Classical work some of the methods which gave educational value to the pursuit of natural science.

Mr. J. F. White, LL.D., in proposing a vote of thanks to Professor Baldwin Brown, said the art of Greece had done as much for the world as the literature of Greece. He mentioned that a scheme was on foot whereby Aberdeen would be provided with the best museum of Classical sculpture in Scotland.

Professor Butcher, in moving that the chairman be thanked for his address, said the coincidence of Germany and America encouraging Classical studies was peculiarly significant, particularly as the two countries quite independently had arrived at the same result. This country was in danger from that superficial reform which under the name of reform was reaction—from the idea that they were to begin with purely utilitarian specialisms and get rid of the wider basis of education, which took time and trouble. The mistake made by the advocates of modern languages in this country was twofold—the commercial people wished to teach modern languages only for the immediate object of the shop, and scientific people looked upon modern languages merely as an instrument in the teaching of science. Once they got the conception of a study that it was to be worked at merely as an instrument enabling them to get on to some other subject, the whole dignity and value of the study was lost. From the first he had advocated the giving of the option which now existed in the University between modern languages and Greek. All he contended for was that, if modern languages were to be taught as an alternative to ancient languages, they should have a dignity of their own and be treated as branches of study which were worthy of leading up to academic study and not merely leading into a commercial house.



## RICHMOND HILL.

AT the meeting of the London County Council on Tuesday the parks committee presented a report in connection with the former negotiations with Sir Whittaker Ellis for preserving the amenities of the view from Richmond Hill. It was pointed out that the properties at Twickenham, known as Cambridge Park Gardens and Haversham Grange, which are within the view from Richmond Hill, are at present owned by Sir Whittaker Ellis. Recently the Cambridge Park Gardens property was offered for sale by auction, but was bought in. The owners of these two properties and of Meadow Bank adjoining to the westward are under covenant each with the other not to build in advance of a certain line. It was the desire of the committee that an agreement embodying this covenant should be scheduled to the Act of Parliament authorising the purchase of Marble Hill; but they were not able to obtain the consent of the owners of the properties to this course in sufficient time to enable this to be done in the Bill then before Parliament. In October, 1901, Sir Whittaker Ellis wrote forwarding a plan showing the line above referred to so far as his properties were concerned, and stating that he would undertake not to build below that line provided the Marble Hill property were retained as an open space. He afterwards wrote stating that if the Marble Hill estate and such other adjoining properties were secured by the London County Council as would, in their opinion, preserve the view from Richmond Hill, he would be quite willing to give such undertaking as the Council might desire that the land he held on the opposite side of the river, being Cambridge Park Gardens and Haversham Grange, should not be further built upon than at present, except conservatories or other buildings of that nature for garden purposes. When, however, Cambridge Park Gardens were recently offered for sale, there was no reference in the conditions of sale to restriction of building other than the covenant with the adjoining owner. On Sir Whittaker Ellis being asked to cause an announcement to be made in the auction-room that the property would be sold subject to the undertaking he had given not to build upon it, he replied, "I certainly never contemplated binding the property in other hands than my own, and of course it will now be for any purchaser of the property to deal with the question." The committee are advised that Sir Whittaker Ellis can be required to enter into the undertaking indicated by his letter, and accordingly recommend the Council to pass a resolution to the effect that such steps as may be necessary be at once taken for the enforcement of the promise, and generally for the protection of the Council's interests in relation to the view.

Captain Swinton pointed out that, in regard to the recent auction of some of this property, Sir J. Whittaker Ellis had gone back on his undertaking not to build.

Colonel Rotton declared that the Council would never have voted one penny for the purchase of the Marble Hill estate had they known that Sir Whittaker Ellis took up the position he now did.

Mr. Torrance took the same view, and said that in this matter the committee had been led into a trap. They had done all they could to come to terms with Sir Whittaker Ellis, but had found it impossible.

Mr. Piggott pointed out that counsel's opinion had been taken, and it was upon that that they were proceeding.

The recommendation of the committee was unanimously adopted.

## PUBLIC BUILDINGS IN NEW SOUTH WALES.

IN his last report to the Department of Public Works of New South Wales, Mr. W. L. Vernon again remonstrates about the policy of neglecting to provide an adequate sum for the conservation of public buildings. He says:—

It is impossible to avoid again calling serious attention, even at the risk of tedious repetition, to the unsatisfactory condition of the large number of buildings, both metropolitan and country. The vote to cover these necessary services, owing to political and other exigencies, is yearly diminishing, while at the same time the number of buildings is increasing, their dilapidations are more apparent, and the occupants are constantly pressing for necessary additions and improvements.

It was strongly urged when the estimates were being prepared, with Federation in view, a special sum should be granted me to place the post-offices of the colony in a good state of repair and efficiency by the time that Federation should be accomplished. In the result, however, this schedule of buildings has had to be dealt with in the hand-to-mouth fashion as all others have, with the consequence that unless a considerable sum of money and very exceptional efforts are made during the forthcoming year, the buildings will be taken over in anything but a state creditable to the colony.

To show more clearly the tendency of the policy of the Government, I have prepared the following statement showing the gradually decreasing percentage calculated on capital

expenditure now available to cover not only repairs, but also improvements. In a previous year's report I expressed it as my opinion that owing to climatic conditions, a sum equal to 2 per cent. per annum on the capital value was necessary to provide against deterioration and a moderate amount of improvements. Fixing therefore 2 per cent. as the datum, it is by no means satisfactory to read the statement, which is as follows:—

Year.	Vote. £	Capital Value of Buildings. £	Percentage of Expenditure. £ s. d.
1889	70,000	3,801,130	1 16 10
1890	65,000	3,834,464	1 13 10½
1891	65,000	3,930,741	1 13 0½
1892	62,000	4,037,233	1 10 8½
1893	23,350	4,081,058	0 11 5½
1894-95	46,000	4,134,223	1 2 2½
1895-96	41,000	4,219,853	0 18 5
1896-97	32,000	4,322,879	0 14 9½
1897-98	37,423	4,393,712	0 17 0½
1898-99	38,750	4,462,000	0 17 4½
1899-1900	19,020	4,693,312	0 8 1½

In the foregoing statement the following buildings only are taken into consideration:—Courthouses, police buildings, post-offices, gaols, institutions for insane, public buildings generally in the metropolitan district; and is exclusive of hospitals, benevolent asylums, custom-houses (country), lands offices (country), public parks and gardens and buildings therein, miscellaneous.

The following extracts from reports of district architects emphasise my own opinions upon this subject:—

Mr. Lewis, of the Orange district, states:—"The public buildings in this district do not receive the attention in the way of painting and repairs that they undoubtedly should. They are generally allowed to go upwards of ten years without being touched, while I have an instance in which the building has not been painted for the last nineteen years. Old paint is allowed to perish and woodwork to show signs of decay before fresh paint is applied, and repairs are not effected until about three years after recommendation. To place the whole in proper order would cost about 3,000*l*. During the year just closed I have been permitted to expend only 430*l*."

Mr. Boissier, Goulburn, writes:—"The buildings in this district are in the following state—twenty-three in good order, thirty-nine in fair order, twelve in bad order, eighteen needing repairs and painting. Of the above twenty-three have not been painted for periods ranging from eight to over ten years, and about thirteen others for from six to eight years."

Mr. MacTaggart, of Albury, states:—"About 40 per cent. of the buildings in this district have been renovated during the past five years, the balance have not received attention from that up to ten years and over, and in several cases the buildings have become extremely dilapidated owing to want of painting and repairs at reasonable intervals. In one case a sum of 250*l* is now required, whereas what is necessary at the proper time could have been achieved by two sums of 50*l* each expended during the past ten years, thus showing an unnecessary expenditure of 150*l*."

Mr. Macgregor, Cootamundra, writes:—"I have to report that the condition of public buildings in this district is very unsatisfactory, a fact strongly evidenced inasmuch that 75 per cent. of them have not had proper attention in the way of repairs, and are in many cases in a bad state of repair; 30 per cent. of the buildings have not been painted for the last eight to ten years."

Mr. Castleden, Tamworth, reports:—"The public buildings in Tamworth are in a good state of preservation, not so those in other centres of the district, a large number of which have not had proper attention in the way of repairs and improvements."

Reference is made in this report to buildings which have not been painted externally for ten years.

Mr. Fitzgerald, Grafton, states:—"I have to report on the necessity of large expenditure necessary to keep the public buildings of this district in proper repair. One-third of the buildings have not received proper attention, and of the remainder about one-half require external painting."

He also furnishes a somewhat long list of buildings that have not been painted during the last ten years.

The Churchwardens of the parish of Isleworth have decided to rehang the famous peal of bells at the parish church, originally cast at the Whitechapel Bell Foundry 135 years ago. According to reports of experts the bells are much worn by the clappers and require quarter tuning. Unless they are rehung there is some risk of their cracking, owing to the clappers striking too near the edge. A fund has been opened to cover the cost of rehangng.



## NOTES AND COMMENTS.

THE removal of the contents of the library from the Palazzo Barberini to the Vatican occupied a fortnight. The utmost care had to be taken of manuscripts and early printed books which the POPE had acquired by the payment of a large sum of money. There are, it is believed, over 50,000 volumes and 8,000 manuscripts. Among the latter the most valuable are those in Greek. A work written on parchment dated 1321 contains drawings of ancient monuments and is evidence of the attention given to archæology at the time. SAN GALLO, the architect, added several drawings by himself to the collection. At least twenty manuscripts of DANTE are there, some with fine miniatures. TASSO is largely represented, especially by notes on Greek authors. The Barberini Library was collected between 1635 and 1640 by Cardinal FRANCIS BARBERINI, the nephew of URBAN VIII. A large number of documents relate to that Pope's pontificate.

AN exhibition of plates and drawings by DANIEL CHODOWIECKI has been opened in the Wallraf-Richartz Museum, Cologne. He deserved notice, for he may be said to have been the German HOGARTH. It was supposed to be complimentary to ADOLF MENZEL, who by many is considered to be foremost of modern illustrators, to designate him the new CHODOWIECKI. He was a native of Danzig, where he was born in 1726. When seventeen he became bookkeeper to his uncle, a shopkeeper, who, among other wares, sold snuffboxes of his own production. CHODOWIECKI was employed to adorn them with paintings, which he copied from prints. In the course of a few years he tried his hand on miniatures, but eventually he took up etching. He is said to have produced a couple of thousand plates, most of them being intended for the illustration of books. Among the authors he served were RICHARDSON, the English novelist, SHAKESPEARE, BURGER, VOSS, GOETHE, SCHILLER. His dramatic scenes are of interest in a historical sense, for he endeavoured to show what he saw in the theatre, and the costume and scenery are suggested. He was a realist. His representations of FREDERICK THE GREAT and his courtiers are accepted as faithful. Like HOGARTH, he aimed occasionally at reform. The extent of the appreciation of CHODOWIECKI is suggested by his appointment as director of the Royal Prussian Academy of Art. He died in Berlin in 1801.

SLATES from Newfoundland have found a ready sale in the English market. This has given much hope to the colonists. Professor HOWLEY, the director of the Geological Survey, says he was surprised at the activity seen at the quarry in Smith's Sound. A fine pier was in course of construction along the water front, being filled in with the waste from the slate. Vessels of almost any size could lay alongside within a stone's throw of the quarry and in perfect safety. A large space immediately in the rear is used for storage purposes, where a display of slate lay piled in tiers awaiting shipment. About fifty men were busily engaged with Ingersoll steam drills quarrying huge slabs from the cliff. These were swung by derricks on to trolleys in waiting and quickly moved to the sheds, where a number of Welsh slaters were busy cleaving and dressing the material into the required dimensions for roofing purposes. The slates are made in two sizes—20 by 10 and 24 by 12. Sandstones and limestones are abundant. In addition serpentines of many varieties and great beauty are met among the magnesian group or metamorphic series, wherever the latter attain any considerable development. A very beautiful green variety of an attractive appearance, admirably suited for ornamental purposes, comes from Tilt Cove in the vicinity of the copper mines. Many kinds of soapstone exist in connection with the serpentine deposits, and beautiful ornamental stones may be encountered in various parts of the country, such as red, yellow and variegated jaspers, amethystine and opalescent quartzite, handsome porphyries, syenites, traps and amygdaloids, and a variety of other minerals. All that is said confirms the conclusions of BEETE JUKES, who was the first to reveal the mineral wealth of Newfoundland.

A SIGN has been added to the collection by deceased artists, to be seen in the Hôtel de Ville, Paris, along with examples by living competitors. It is by the painter of the *Angelus*, JEAN FRANÇOIS MILLET. It was produced during the period when he was among the crowd of students in PAUL DELAROCHE'S atelier. Although only about twenty-two, MILLET had had probably a more varied experience than any of the young artists around him. He had not only studied with provincial artists, but he also had toiled as a farm labourer, and for a time managed his mother's farm. His family belonged to a village near Cherbourg, and it was in the latter place he began the systematic study of painting. The sign was painted for a veterinary surgeon at Cherbourg, and for long was affixed to the premises. The subject was a horse in a field, and the execution shows that the artist was well acquainted with animals. The picture is the more remarkable because, although MILLET devoted himself to country scenes during the latter part of his life, he preferred peasants to quadrupeds of all kinds.

AMONG the old buildings in Tonnerre, in the department of Yonne, is a part of the large hospital which was founded in 1293 by MARGUERITE DE BOURGOGNE, the sister-in-law of St. LOUIS. There are not many examples of its class existing. The large salle was lighted by lancet windows. The beds were arranged in two rows along each side, and the centre was vacant. The roof was not vaulted, but carried by large beams, which testify to the size of the trees then growing in France. A statue of the queen is found on her tomb. The capaciousness of the great hall has induced the municipal authorities to propose the conversion of the hospital into a covered market. It was to meet such vandalism the Commission of Historic Monuments was established, and it would be a blow to archæology if the members failed in their duty on this occasion. The hospital of Tonnerre is not the oldest in France, but since the destruction of the Hôtel Dieu in Caen is the best example which has survived. It is also remarkable because of the wide space which was made available without the aid of piers.

## ILLUSTRATIONS.

RIVER PLATE HOUSE, FINSBURY CIRCUS, E.C.

CATHEDRAL SERIES: HEREFORD.—EAST WALL OF SOUTH TRANSEPT.

NEW STABLING AT WARLINGHAM.

NEW FIRE BRIGADE STATION AT EAST GRINSTEAD, SUSSEX.

STATIONERS' HALL, LUDGATE HILL: THE BOARD-ROOM.

THE Stationers' Company can be considered as more fortunate than the majority of the other trade guilds in London, for a revenue is derived from the registration of books and various publications. The origin of the Company might be regarded as an experiment in Inquisitionism during the reign of Queen MARY. The members formed, as it were, an Index department on a small scale, for they were empowered to seek and destroy books which they assumed to be not sufficiently orthodox. There was also a privilege to print certain books, almanacs being one of them. The last relic of the monopoly was the useful "British Almanac and Companion," the "Companion" being originally a rival publication by CHARLES KNIGHT. It could not be said there was a severe supervision exercised by the Company over their own productions. A heavy fine was once imposed by the Star Chamber for an omission in an edition of the Bible. By giving a commercial character to the Company in supplying capital there were more successful results. Some of the members left substantial sums to increase the general property. Whether the Company serves any useful purpose has been disputed, for it is believed by many lawyers that the system of registration does not confer the protection which is desirable.



## PORTRAIT PAINTING.

A COURSE of lectures on portraiture has just been delivered in Dublin by Sir Walter Armstrong, the director of the National Gallery of Ireland. In the first lecture, according to the *Irish Times*, it was said that the ostensible purpose of all portrait painting, the task, at least, to which all portrait painters were invited, was essentially the same. They were not called upon to produce works of free art, creations on which the expression of their own intimate æsthetic selves was modified solely by the nature of the material. The portrait painter was invited to submit his own individuality to that of another, to do his utmost to make immortal one who possibly might be unsympathetic to himself. Such a task was not an easy one. It demanded, in fact, the highest powers of the artist. A great portrait need not shrink from the rivalry of any plastic creation. If, in their minds, they reviewed all the great painters of the world, putting aside those who deal exclusively with landscape, they should find only two whose possible masterpieces were not portraits—Michel Angelo and Correggio. These two were the great conspicuous exceptions which gave a point to the generalisation he had ventured to make. It would scarcely be going too far to assert that the most faultless production of every other prince of art was a portrait. From the point of view of rank and dignity, then, the subject yielded to no other open to the student of art. For those who loved and understood the art of painting the subtle differences between one masterpiece and another would be an inexhaustible source of pleasure. As a preliminary to explaining what it is that makes a good picture, the lecturer sketched and illustrated by examples of work the normal development that takes place in the artist's mind between the day when he first enters an art school and the day when at last he finds himself able to create. The various processes or steps were divided roughly into three stages, in the first of which the work was purely imitative. In the second stage the artist's work gave evidence of "arrangement." The young artist was not content with imitation, but prefaced it with manipulation of the things to be imitated. The last stage in the evolution of an artist was that in which it dawned upon him that his business was not to imitate, but to make—that nature was a means to a picture and that he never must subordinate the interests of the latter to those of the former. The last thing the young painter learned was the expressive power of the material in which he worked. Before bringing this lecture to an end he wished to say the little that need be said of antique portraiture.

*Ancient Portraits.*

The portraits that had come down from what used to be called the early ages of the world were no doubt numerous enough. They were also profoundly interesting from certain points of view, although they were not in the great majority of cases the result of desires similar to those which had governed what they meant by portraiture. Most of them, again—nearly all, in fact—were in some material less readily damaged by time and accident than any form of paint. The only exceptions of any moment were the coloured statues which had come down to them from the early dynasties of the Pharaohs, such as "The Scribe" in the Louvre, which contain the arts of the painter and the sculptor. Examples were to be seen in the greater museums and galleries. The National Gallery in London has eleven. Apart from these sporadic hints at what they had lost, antique portraiture had come down to them in the works of sculptors. The Egyptians, the Assyrians, the Chaldeans, the Greeks and the Romans all preached iconic sculpture. Among the finest things they possessed were the portrait figures in wood and limestone from the ancient and the middle Empires of Egypt. The "Wooden Man of Boulak," "The Scribe," and the numerous figures of servants, agricultural labourers and dwarfs, tradesmen, and so on, which had been drawn from the cemetery of Memphis to people the Cairo Museum, would be remarkable at any time and in any country. The astonishing thing about all this Egyptian sculpture was that the older it was the finer was its art. Speaking broadly, Egyptian art as we know it embodied long and gradual decadence from the culmination which occurred, perhaps, 6,000 years before the Christian era, in the days of those Pharaohs who built the pyramids of Ghizéh. If it took thirty centuries for Egyptian sculpture to decay, how long did it take to climb up to the greatness it had reached before the first glimmering taper of history began to make visible the darkness of the past? The comparative chronology of early Chaldean sculpture was still so unsettled that nothing definite could be said as to the art of Egypt. The few remains which had so far been discovered were nearly all in the Louvre, and consisted of a series of headless figures found at Pello, or Lower Mesopotamia, between 1876 and 1880. A few isolated heads were also found which had a peculiar interest of their own on account of their affinity in type to the Chinese. That affinity became extraordinarily suggestive when taken in connection with the fact that the earliest Chaldean written

characters had so much in common with ancient Chinese writing that they had enabled European scholars to decipher Chinese classics even in cases where the Chinese themselves were at fault. The Assyrians bore much the same relation to the Chaldeans, their predecessors in empire, as the Egyptians of Thebes did to those of Memphis, or the Greeks of the Roman Empire to those of Periclean Athens. Their activity was greater and their output more copious, but they had lost truth of observation, sincerity of feeling and delicacy of execution, so that the portraits they turned out in such numbers had very little individuality. Even in the sculpture of the Second Theban Empire in Egypt they were able to recognise individuals. Such recognition was hardly possible among the Assyrians. The oldest Assyrian monument yet discovered dated from the twelfth century before Christ, when all the civilisation of the two great valleys—those of the Nile and the Euphrates—had substituted material ambitions for the expression of sincere artistic emotion. Among the Greeks and their vigorous but vulgarised echoes things took a different course. In the great days of Greek art, portraiture for its own sake was almost unknown. A private patronage gradually superseded the patronage of the State; portrait sculpture increased enormously until it formed the larger part of the whole. But even then it did not become portraiture in the modern sense. Its aim was not so much to grasp character and preserve it, to note personality, and hand it down to posterity, as to generalise and lay stress upon the attachments of an individual to his kind—to produce, in short, a type modified by an individuality. Even so the Greeks were not great portraitists. The really fine busts and statues are very rare. The British Museum has a good bust of Pericles by Cresilas, Lord Leicester one of Thucydides at Holkham. Those of Alexander are numerous and sometimes good, though never so fine as portraits struck on the coins of his successors. The best of the full length statues were those of the dramatists Sophocles and Euripides, of the orator Demosthenes and the poet Posidippus. Before each one felt that their production was not entirely governed by the spirit of portraiture, but that, perhaps, higher spirit of idealisation which had presided over Greek art almost from the beginning. With the Romans portrait statuary was no doubt founded on that of the Greeks, and a great deal of it the work of Greek brains, but its inspiration was somewhat more modern. The best Roman portraiture—he might say the best Roman art—was to be seen in the great series of Imperial busts with which the older European museums are filled. He might instance the well-known busts of Julius Cæsar, of the Emperor Pertinax, the Empress Crispina, all in the British Museum. He instanced the greatest, perhaps, of all Roman portrait statues—the seated figure of Agrippina, with its beautiful drapery, in the Capitol of Rome. They might think, perhaps, that he had passed over antique portraiture in too rapid a fashion. It was impossible to discuss it exhaustively in one of a series of lectures like these. The ruling aim of the Greek or Roman artist was seldom, if ever, portraiture pure and simple. His object was to hold up a name to glory, the applause of contemporaries and the admiration of posterity, and not to reproduce an individual with all his qualities or defects. His ultimate intention was in no sense to leave a document for the information of historians and biographers, but to do for his patron in a suitably modest fashion what Phidias did for Zeus, or Praxiteles did for Aphrodite. If, in many cases, he did produce a fine portrait, it was rather adventitious than essential, and rather by way of making sure that there should be no mistake about the identity of his patron.

*Italian Portraits.*

In his second lecture Sir Walter Armstrong said their subject was the portrait making of Italy during its greatest and most famous period. The movement which they called the Italian Renaissance began, as they were aware, with the revival not of the plastic arts, but of learning. After sketching briefly the origin of the Renaissance, and its effects first on architecture and afterwards on sculpture, he pointed out that the Italian Renaissance was not the isolated movement they sometimes imagined. Between the inauguration of modern Italian (as distinguished from antique) fine art by Nicola Pisano, about 1230, and the first appearance in the peninsula of the particular branch of art with which they were at present concerned, something like two centuries elapsed. The first modern portraits, in the sense in which we now understand the word, were those records of their own personal appearance which the early sculptors and painters were so fond of introducing into any work which they expected to bring them credit. The first Italian portrait painter in anything like the modern sense of the word was Antonello da Messina, who was probably born about 1444, three years before Botticelli, and nearly forty years before Raphael. Antonello saw from the works of Van Eyck what fine things could be done in portrait and in the hitherto despised method of painting in oil and varnish. Fine as Antonello's work was, his chief importance lay in the stimulus he gave to his contemporaries.



In the generation which preceded the full development of art in Italy, the work did not greatly differ from that of Jan Van Eyck. The lecturer then discussed those men who carried the art to the highest development of which it was capable. The first man to sound the possibilities of its depths was Leonardo da Vinci. Before the end of the fifteenth century he had painted various portraits, of which only one could be traced—the panel in the Louvre, which might fairly be called the most famous of all portraits, the *Mona Lisa Giocondo*. The story goes that he spent four years over the portrait, and then left it unfinished. He had called the *Mona Lisa* the first modern portrait, because it was the first to make the expression of an individuality the ruling vote of an æsthetic conception. Leonardo had seized upon *Mona Lisa's* character, had taken it in action so to speak, and made a really felt emotion dominate his scheme. He had combined life with repose in a way approached by no artist anterior to himself, and by very few since his time. It is not too much to say that in the *Mona Lisa* a phase of vitality was first made to govern an artistic design. The effect in Italy was instantaneous. The frankest admirer was Raphael himself. He made a drawing, now in the Louvre, which is almost a copy of the *Mona Lisa*, and from this drawing he painted a famous portrait, now in the Pitti Palace at Florence. The *Mona Lisa* was finished with the fifteenth century, and the flush of perfection which immediately began to spread over Italian portrait painting dated from the first decade of the sixteenth. Raphael never quite shook himself free of Leonardo's domination. The hands of the *Mona Lisa* especially seem to have been his school; they were the standard of what hands should be, and of how they should enforce a personality, and their character was echoed curiously in everything he did after about 1508. Raphael, as they knew, was the culmination of the school to which he belonged. After referring to the work of several of Raphael's pupils, which, he said, represented not a climax continued, but the beginning of a decadence, the lecturer said that in Venice the first man to produce a portrait in which they could admire the full power of art was probably Giorgione—he said probably, because, as a matter of fact, this artist's works were so much in dispute that it would scarcely be fair to tell them that any existing portrait was certainly by him. The dates were not quite certain, but in all probability Giorgione was Titian's senior by above twelve years, and the probability that Titian was only eighty-eight, and not within a few months of his hundredth birthday when he died, would justify the claim of Giorgione, who was born not later than 1477, to be considered the first Venetian painter in whom the full bloom of the late Renaissance showed itself. They might take as representing Venetian portraiture during the sixteenth century Giorgione, Titian and Tintoretto. The Venetian painters had betrayed their love for colour very early in the fifteenth century, so that when the genius of Giorgione met the achievement of the early Paduan, Florentine and Bolognese masters he had only to crown it with Venetian splendour to create an art which has no equal in its own way. The finest Italian school of portraiture was that of Venice in its flower. Since it disappeared the art has flourished in the Low Countries, in Spain, and in the British Isles, and in them all the influence of Venice is to be found.

#### *German, Dutch and Flemish Portraits.*

The third lecture related to "German, Dutch and Flemish Portrait Painters." Sir Walter Armstrong introduced his subject by explaining that portraiture, as we know and think of it, began, not in Italy, where it first touched perfection, but in the Low Countries. The creator of the art was the younger of the two Van Eycks. The example set by Jan Van Eyck had a great effect in his own country, as well as in the distant peninsula beyond the Alps. Albert Dürer, born thirty-one years after the death of Van Eyck, breathed a new life into German art. He was a Hungarian by extraction, but it was possible that the German Leonardo, as they might call him, was by blood a Magyar. He was one of the most inquisitive of all artists. His portraits were thoroughly Germanic in conception. The second great German was Hans Holbein. He proposed, as he had made the two greatest of Germans stand for the German school as a whole, to take F. Hals and Rembrandt as representatives of Holland and Rubens and Vandyke as those of Flanders and Brabant. Now, while the German portrait painters were as objective as they knew how to be, suppressing themselves and stating the facts with a curious mixture of intelligence and patience, the Dutch and Flemings took a diametrically opposite course. Hals, Rembrandt, Rubens and Vandyke each and all used portraiture for the declaration of their own æsthetic predilections. This they did to such an extent that one sometimes felt in danger of losing the sitter under the artist. To these four men and the school to which they belonged art was the essential matter, while facts to be recognised were accidents clinging about it. The Germans reversed the order, the facts with them coming first and art slipping in behind as a sweetener.

It was, of course, all a matter of degree, of proportion, between one ingredient of a picture and another. But these proportions were so differently understood by the two schools that the products of the one were cut off, as with a knife, from those of the other. Hals, the first of the great Dutchmen to mature, was older than Rembrandt by nearly a generation. He was solely a portrait painter, although some of his portraits were so conceived that they would do for fancy pictures too. Rembrandt was perhaps the most concentrated artistic personality of whom they had any record, and was the last to appear of the twelve great painters who rose like spires over the artistic history of the sixteenth and seventeenth centuries. After his tentative period it is easy to see that he never sets out to realise the hopes of a sitter. His interest is excited by some pictorial problem, some combination of light and shadow, line and texture for which the client will give the opportunity. In his very early years, before he was twenty-five, Rembrandt's inspiration was really iconistic. At last one feels that he looks upon his sitters as models, pure and simple, pegs to hang his own personal conceptions on. Rubens, born in Westphalia in 1577, and his pupils were next discussed, the greatest of them being Anthony Vandyke. These great artists of the Low Countries were all men of strong individuality. Rubens sacrificed much to the rendering of exuberant vitality of the life which seemed to radiate, as heat does from the sun, from his abundant men and women.

#### *Spanish and French Portraits.*

The subject of the fourth lecture was "Spanish and French Portrait Painters." It was said that the historian of art had to face few more difficult questions than that of the early growth of the French school. So far as he knew, there were only two questions connected with modern art—with art more recent than that of the ancient Greeks and Romans—which presented more difficulties. These two were, of course, the origin, extent and comparative importance of the art which flourished in this island during the dark ages, and the place which should be occupied by English art in a history of Europe during the Middle Ages. The general art movement of Northern Europe during the twelfth, thirteenth and fourteenth centuries—a movement in which the gifts and energies of the French people were the most important factor—had never yet been properly appreciated. In many cases the happiest of the contributions to the early artistic movement were made by the inhabitants of a district about the size of Ireland, of which Paris was the centre. After explaining the connection between this early form of art and the architectural requirements of the times and districts in which it flourished, he found in the arch the background, if he might call it so, on which all the arts were embroidered during the centuries which immediately preceded the irruption of the Italian Renaissance from the south. Having discussed the character of the work done by Jean Perréal and Fouquet in introducing Italian ideals into France, he said that, unfortunately, the Italianising influence was not good for the French painters. Many of those who worked under the domination of Italian ideas became famous, but none produced work which could rank with similar things being done in other parts of Europe. The work of the two Clouets was discussed, and it was pointed out that they were what in England were called limners. After Janet's death came a long unsatisfactory period in French painting generally. What was wanting was sincerity. Of course there were exceptions, such as the two Poussins and Claude in the seventeenth century, and Watteau and Chardin in the eighteenth—the two latter personalities being among the most original in the history of art. The painter of Louis XIV. were miserable creatures—to use a phrase of Carlyle. In Spain they found a very different evolution. There the Gothic wave broke against the traditions of the Moors, and before it had thoroughly exhausted itself, had to submit to the further modifications brought about by the infiltration of Italian ideas. In no country in the world were more charming results produced by the combination of Gothic with Renaissance form than in Spain. As an instance of this work the lecturer cited the choir of Toledo. The Inquisition, or rather those constituents of the national character which made the Inquisition possible, pressed heavily on the plastic arts. From the middle of the sixteenth to the end of the seventeenth century a stream of good portraits issued from the Spanish studios. After discussing the limitations which resulted from the Spanish view of women, he pointed out that the first of the great Spanish portrait painters was Coello, who had been described as the Velasquez of the Court of Philip II. Next to Coello came Theotocopuli, known as "Il Greco," who was said to have studied the school of Titian, but judging from his style it was much more likely that Tintoretto was his master. Velasquez, the greatest of the Spanish painters, was almost contemporaneous with Vandyke. He was essentially a portrait painter, and must rank with Titian, Rembrandt, and Holbein as one of the four greatest portrait painters of the world. After noticing the



work of Murillo, the lecturer pointed out that the last great Spaniard was Goya, who died in 1828. During the eighteenth century, when Goya alone was adding to the artistic treasures of Spain, French painting was showing signs of renewed sincerity. Watteau lived to add a new feature to the art of his country. After him came Chardin, who began to do for the society in which he lived what the Dutchmen of the seventeenth century had done for those of Amsterdam and The Hague. In the second half of the century Greuze and Madame Le Brun were both real artists in their way. The French Revolution profoundly affected art. Classic models alone were accepted, and painters were expected to work in the spirit which might be taken as that of the Roman studios. David was the leader of this phase of French art. The last representative in France of the ideas which governed the classical of the Republic was Ingres.

#### *British Portraits.*

On Saturday the last lecture of the series was given. The subject was "British Portrait Painting."

Sir Walter Armstrong explained that modern painting, using the word modern in its most restricted sense, is founded mainly on the example of the English painters of the eighteenth century. The differential physiognomy, the collection of characteristics which will enable a connoisseur of, say, the twenty-third century to distinguish at a glance between a picture produced during the nineteenth century and one of the seventeenth is founded on the example set by Hogarth, Reynolds, Gainsborough, Constable and other natives of the British Isles between 1750 and 1820. Modern European painting was seen to have taken off, if he might use such a phrase, from what was being done in London in the days of George III. Discussing the beginnings of English portraiture, the lecturer said that the earliest portrait we can point to in England is that of Richard II., which hangs in the choir of Westminster Abbey. It had been called Venetian, Sienese—anything but English—and yet there was plenty of evidence to show that England at the end of the fourteenth century, when this picture was painted, had artists quite capable of such a work who may well have spent some of their pupilage in Italy. Between the painting of this picture and the next portraits of any merit which England could claim came the Wars of the Roses, and the still more destructive era of the Reformation. Between the reign of Richard II. and that of Henry VIII. English portraiture is chiefly represented by a few heads of kings, rough copies mostly of originals which go to prove that the paramount influence in these islands during the fifteenth and early sixteenth centuries was that of travelling painters of Flanders and Brabant. The earliest group of English portrait painters to reach any high degree of merit was that which made its rise in the studio of Holbein. At least two of Holbein's assistants—Strete and John Bettes—were men of remarkable ability, but unfortunately we know very little of either. Discussing art during the Elizabethan period, the lecturer pointed out that two-thirds of the portraits were ascribed to Frederigo Zuccaro. From the beginning of the sixteenth century to the middle of the seventeenth the distinctive school of English portraiture was that of the miniaturists. Isaac Oliver, Peter Oliver, Nicholas Hilliard and John Hoskins formed a quartette to which we owe a splendid illustration of the men and women of the courts of Elizabeth and James I. After them came one of the greatest and most original of all portrait painters, although his works seldom exceeded a crown piece in size. This was Samuel Cooper, whose miniatures are among the determining causes of the form taken by painting in England for more than a century. After pointing out that Vandyke's English art was chiefly taken from Cooper, he argued that it was not unreasonable that the English should claim a share of the distinction of Vandyke, and argue that if Vandyke had never come to London he would never have done anything, so kingly and elegant as the Charles I. which they had seen on Thursday. Still Vandyke's was the chief external force in deciding the line to be taken by English art for the century which followed his death. The patronage of foreign artists and the work of Peter Lely were next discussed, the lecturer urging that, on the whole, Lely deserved his triumphs. Having reviewed the work of Greenhill, John Riley and Godfrey Kneller, the latter of whom practically monopolised English portraiture between Lely's death in 1684 and his own death in 1723, the lecturer pointed out that the distinctively English school of art, and, speaking more generally, the sentiment and practice of art which still existed in modern Europe, dates from Hogarth. Before Hogarth died he may possibly have realised that a new era had dawned for English art. Reynolds and Gainsborough had both begun to attract attention, and the author of "Marriage à la Mode" may have seen these pictures at one of those exhibitions which foreshadowed the founding of the Royal Academy. Reynolds and Gainsborough were the two great names in art of the eighteenth century. Gainsborough had the finer genius, but Reynolds the gift of

thought. When Gainsborough's inspiration was at its best, he could reach heights never quite obtainable by Sir Joshua. There was nothing in the work of Reynolds which could bear without damage the juxtaposition of such things by his rival as the Mrs. Sheridan at Tring Park, or the "Blue Boy" at Grosvenor House, or the Lady Mulgrave, or the Mrs. Robinson in the Wallace Gallery, or the "Morning Walk," or even the Mrs. Siddons in the National Gallery. In these there was a force which was beyond Sir Joshua. The lecturer showed twelve of Gainsborough's portraits in order to bring before his audience the best type of the eighteenth-century portrait painting, which was, he said, so important in the English school. Among these was the picture which led to Gainsborough's quarrel with the Royal Academy. The third of the great English trio was Romney, although some would substitute Hoppner's name for his. Hoppner was not such a striking personality as were Gainsborough, Reynolds, and Romney. Romney afforded the most striking instance of the way in which an artist's fame may fluctuate. After his death his pictures were sold for such prices as 15s. to 2*l.*, but now the possessor of a very fine Romney had to pay 50*l.* a year for the privilege of having it on his walls. Romney was inferior to both Gainsborough and Reynolds as a colourist, nor could he compare with either in vivacity and force, but in design and the felicity with which his lines swept about the canvas, he excelled them both. His sense of female beauty was greater than Sir Joshua's, and about equal to that of Gainsborough, while his execution had a simple directness almost without parallel in the English school, or indeed anywhere else. Next to these three came the Scottish master, Sir H. Raeburn, born in 1756. Neglected by connoisseurs and collectors, it was left to loan exhibitions to rescue his work from obscurity. After the death of Raeburn in 1824 portrait painting sank to a low ebb in the British Isles. Lawrence was the only man of distinction, and he died in 1830. For ten years there was no portrait painter who was really an artist, with the exception of John Constable, the great master of landscape, who during his later years indulged in his old pursuit. After Constable's death in 1830 we got so close to our own time that generalisation became dangerous. Future generations might find in some of the men who were at work during the early years of Victoria a charm which was invisible to the present generation. The lecturer having glanced at the work of contemporary artists, including Watts, Millais and Sargent, said that he had to ignore the miniature painters who flourished at the junction of the eighteenth and nineteenth centuries. No nation in Europe had equalled or even seriously rivalled the English in the mingled dignity and charm of their miniatures. In any review of the great art of portrait painting the work of Richard Cosway, of George Englebert, of John Dowman, of Horace Hone, of the two Plimers, of the three Robertsons, of Samuel Cross, and, above all, of John Smart, who combined sympathy and breadth of treatment with minute finish in a way that put even Gerard Dow to shame, would have to be taken into serious account.

At the close of the lecture the Dean of St. Patrick's thanked Sir Walter Armstrong for his admirable addresses, and congratulated the College on securing his services as lecturer, and Sir Walter Armstrong briefly replied.

We are indebted to the *Irish Times* for the foregoing excellent reports.

#### MANCHESTER ROYAL INFIRMARY.

A PRIVATE meeting of the new board of management of the Manchester Royal Infirmary was held on Monday. Mr. John Thomson presided. At the meeting held a week ago it was suggested by the chairman that it would be necessary to obtain a distinct offer from the Owens College Council with regard to the site in Stanley Grove, and that any conditions which might accompany the offer could then be fully considered with the plans before the Board. At the meeting on Monday two committees were appointed. One committee is to report upon the legal position of the trustees with regard to the Piccadilly site before entering upon negotiations for the sale of it. The other committee is to inquire and report (1) whether the Stanley Grove site is the best available, and (2) if so report fully regarding that site, and the portions of the estate allotted to the Southern Hospital and the Cancer Pavilion and also upon the property adjoining. These committees will proceed to work at once and submit their reports to the Board at as early a date as possible. The Chairman read a letter from the Principal of the Owens College formally offering the Stanley Grove site for a new infirmary. The total area of the property at Stanley Grove is 12 acres 2 roods and 27 perches. The Cancer Hospital occupies 7,573 yards, and the Southern Hospital authorities have a covenant to build within a few years on land which extends over 12,176 yards. The committees are not expected to report fully before another month has elapsed.



### ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE preliminary examination, qualifying for probationership R.I.B.A., was held in London and the undermentioned provincial centres on November 4 and 5. Of the 163 candidates admitted, 54 were exempted from sitting and 109 were examined, with the following results:—

Centre.	Number Examined.	Passed.	Relegated.
London . . . . .	61	39	22
Birmingham . . . . .	13	10	3
Bristol . . . . .	5	3	2
Leeds . . . . .	10	7	3
Manchester . . . . .	13	10	3
Newcastle . . . . .	7	6	1
	109	75	34

The passed candidates, with those exempted—129 altogether—have been registered as probationers.

The intermediate examination, qualifying for studentship R.I.B.A., was held in London and the undermentioned provincial centres on November 4, 5, 6 and 7. Ninety-eight probationers were examined, with the following results:—

Centre.	Number Examined.	Passed.	Relegated.
London . . . . .	67	40	27
Bristol . . . . .	5	3	2
Glasgow . . . . .	6	5	1
Leeds . . . . .	7	2	5
Manchester . . . . .	13	4	9
	98	54	44

The final and special examinations, qualifying for candidature as Associate R.I.B.A., were held in London from November 14 to 21. Of the 49 candidates examined, 20 passed, and the remaining 29 were relegated to their studies. The following are the names of the passed candidates:—

R. Bennett, W. E. Brooks, F. B. Chester, W. St. L. Crowley, W. Greenwood, J. H. Higson, J. Holt, H. J. B. Hoskins, J. I. P. Jones, J. M. Lethbridge, T. F. MacLennan, C. E. Monro, G. S. Nicol, C. E. L. Parkinson, H. T. Rees, N. T. Salmon, S. Towse, W. H. Watkins, H. White, F. C. Wrigley.

The following shows the number of failures in each subject of the final:—

I. Design . . . . .	23
II. Mouldings and Ornament . . . . .	23
III. Building Materials . . . . .	14
IV. Principles of Hygiene . . . . .	12
V. Specifications . . . . .	8
VI. Construction, Foundations, &c. . . . .	13
VII. Construction, Iron and Steel, &c. . . . .	16

The Board of Examiners recommend that the Ashpitel prize be awarded to Mr. William Greenwood, of Blackburn (probationer 1900, student 1901), he being the candidate who has distinguished himself most highly in the final examinations of the year.

### THE "PALACE OF HENRY VIII."

IN the early part of 1901 the London County Council purchased the freehold of the ancient building, No 17 Fleet Street, which was reputed to be the palace of King Henry VIII., with a view of preserving the historical portions from destruction. The demolition of the entire building had been decided upon, and the Council deserve credit for rescuing and retaining the unique ceiling of the council chamber and the original front of the house, which has for many years been hiding behind a mask. During the last fifteen months the business of the proprietor, Mr. John Carter, has been carried on in the old council chamber of the Duchy of Cornwall in days of James I. The first part of the contract, however, is complete, and two saloons are now open. The County Council will shortly proceed with the front part of the building, and will take down the historic ceiling and panelling in the council chamber and remove them to South Kensington; there the restoration will be taken in hand under the supervision of Sir Purdon Clarke. He is of the opinion that the ceiling, with its saracens' heads and other plaster reliefs, is the finest specimen of the kind that he has seen. When finished they will be returned to Fleet Street and will be replaced in their original positions in the council chamber. The County Council have arranged that the public shall have access to this piece of old London.

The front of the house, which now overhangs the pavement, has been found to be a false one masking the original. This front will in rebuilding be removed and the original, consisting of carved oak pilasters and other attractions, will be restored to its original beauty and replaced.

The shop-front will be set back about 5 feet and the upper part thrown out on cantilevers to overhang the pavement. This work may occupy some months, but when finished the

building will form quite a landmark within a few yards of where Temple Bar stood, and will continue to be one of the permanent attractions of Fleet Street.

### AMERICAN RENAISSANCE.\*

CIVILISED man and especially one of Anglo-Saxon descent is a home-loving creature. To him the dwelling-places stands for his most important institution. The arts, sciences and traditions he pursues mainly as they are to minister unto it, and its fruition is the goal of life. About this dwelling-place, then, there must be a very great deal to be said, indissolubly associated as it is with everything in life worth having—one's childhood, parents, children, wife, sweetheart, and next to these one's own personal comfort—one's hours of leisure and recreation. Therefore, just so much as Domestic architecture departs in an impersonal, artificial way from whatever relates to or reflects these associations, just so much does it err—does it fail. It will be obvious upon a moment's consideration that any cold-blooded practice or discussion of academic formulæ alone, looking to the development of American Domestic architecture, is hopelessly futile and inefficient.

The home one builds must mean something besides artistic and engineering skill. It must presuppose by subtle architectonic expression both in itself and in its surroundings that its owner possessed, once upon a time, two good parents, four grandparents, eight great grandparents, and so on, had, likely brothers and sisters, uncles and aunts, all eminently respectable and endeared to us, that *bien-séance* and family order have flourished in our line from time immemorial—there were no black sheep to make us ashamed—and that we have inherited heirlooms, plate, portraits, miniatures, pictures, rare volumes, diaries, letters and State archives to link us up properly in historical succession and progression. We are covetous of our niche in history. We want to belong somewhere and to something, not entirely cut off by ourselves as stray atoms in boundless space either geographical or chronological. The human mind is a dependent thing, and so is happiness. We may not indeed, have inherited the house we live in, the chances are we have not. We may not remember that either of our parents or any of our grandparents before us ever gloried in the quiet possession of an ideal homestead; but for the sake of goodness—for the sake of making the world appear a more decent place to live in—let us pretend that they did, and that it is now ours. Let us pretend that God has been that good to us, and that we have proved worthy of His trust. With this much of psychological preparation, I believe it is possible for every cultivated American man or woman to approach the subject of American Renaissance architecture—Domestic architecture—in the true spirit of understanding.

By American Renaissance I allude to no "American style." That much abused term "American style," which so frequently crops out in treatises upon architecture, were you to follow it up would be found to signify, as a rule, merely American non-sense and aberration. And I suppose there is no nation which may show such an imposing array of architectural non-sense as the United States during the last brief 50 years of their independence. Certainly no nation has evolved a national style of architecture, intentionally, as is being constantly urged upon American enterprise. Such a thing could have no historic value, while it could not escape being vulgar and monotonous. Characteristic architecture is a dead slow development, and although there have been building epochs of remarkable activity, in none is the progress appreciable from year to year. American Renaissance differs from that of other countries only as it has been affected by the local conditions and requirements of America. Good modern Renaissance—regret there is a sight of building that is bad—is very like good-breeding, pretty much the same the world over, differentiated only by local colour or custom.

The predominant local colour which distinguishes American Renaissance has been given to it by what has been our great national building commodity, *i.e.* wood. The Greeks and Romans built of stone when they had the money to pay for it as does everybody else; otherwise, people in new countries fall back upon a less expensive material. Our less expensive material was wood. Both stone and wood have grain, and have to be used with the same careful regard to it. Whether we build our columns up of stone or wooden sections—latitudinal in the one case, longitudinal in the other—to support a cornice also constructed in sections according to the convenient size of commerce for the particular material, makes no difference to the canons of art so long as we are not trying to deceive or to imitate one material with another simply with that end in view. It is extremely doubtful if our American ancestor

\* From an article by Joy Wheeler Dow, architect, in the *Architect and Builders' Magazine*, of New York.



were ever guilty of premeditated deception. Their material was an honest material, it had to be fashioned in some way, why not after the manner of the Renaissance? In our own day of numerous shortcomings in matters architectural it rarely enters the head to deceive upon this point. Notwithstanding the tremendous resources now at command, we yet prefer wooden columns to stone ones for dwelling-houses. As national wealth has increased, however, there has been that natural tendency, of course, to carve the Renaissance details of stone, and the white marble porches of Washington Square, North, may be cited as splendid bits of American Renaissance. But if we go further, and by reason of accumulated affluence erect the entire structure of the new Colonial house in stone—columns, cornices, window and door casings, &c., strange to say we lose an indefinable charm—a certain warmth and personality with which American history has invested wood. Besides, the fashion and style of Renaissance motive and detail is as suitable to wood as it is to stone; and if the former material is not quite so durable it is much more easily repaired and replaced.

In English Renaissance, local conditions commonly restricted the use of wood to the interiors. In American Renaissance, the plenitude of this material enabled the Colonial builders to use it for the outside as well, and with great advantage, for it permitted the colonist to elaborate the elevations of his dwelling, gaining thereby warmth, cheerfulness and grace, and all easily within his means. Without the slightest danger of bankruptcy he could proceed to embellish the curtilage with arched gateways, ornamental fences, terrace rails and summer-houses *ad lib.*

Had America been settled and colonised two centuries earlier under a Tudor king, most likely there would have been a Gothic influence in the early work. It is difficult to know in our day how it could possibly have been exploited in wood, and there is no excuse for our attempting anything of the kind at this time of unlimited resources in the building trade. Battlements, keeps and moats were feudal protectory measures, and would have been worse than useless constructed of anything inflammable. About the only legitimate Gothic architecture expressed in wood which has stood the test of time is represented by the seventeenth and eighteenth-century chalets of Switzerland, and I doubt if even Yankee ingenuity could have evolved anything half so good. As a matter of fact we have no ancient Gothic exemplars. It is said that the old Pickering house on Broad Street, in Salem, built A.D. 1649, was a replica in wood of a Jacobean tavern in England, namely, the Peacock inn, Derbyshire. The venerable dwelling at Salem has passed through many vicissitudes, and in 1842, when the influence of John Ruskin was so misused in America, the Pickering house was largely remodelled, so that it is impossible to say to-day how successful an adaptation of Jacobean work this was. But even Jacobean architecture is scarcely Gothic architecture, since England incorporates it with all the rest of her Renaissance.

Sir Christopher Wren was supreme upon the architectural stage of England when the prosperity of the American colonies was sufficient to warrant the academic study of Domestic architecture upon this side of the Atlantic, and Sir Christopher was the very life of the English Renaissance in its stricter sense. During this great history-making epoch the giant forests of America came into excellent play for following out—if often in a crude and kind of miniature way—whatever the prodigious architect executed in stone. There was no bit of Classic detail from either Athens or Rome transmitted to London through what I may call the Florentine Clearing-House presided over by Palladio, Sansovino, Scamozzi and their contemporaries, but what it could be carved more readily in wood, and time and history have thrown a glamour over all this wooden development of ours, and established its right of succession with a hall-mark.

But the main point in favour of Renaissance architecture must be remembered was that it lent itself extremely well to the Anglo-Saxon home feeling. It emanated from a land that had reached the pinnacle of attainment in the arts of peace, Italy, and it was so easy to fashion and make minister to most Anglo-Saxon home requirements. Luckily the colonial builders were conservative artificers, neither so clever or so restless as this generation, or they certainly could not have resisted the eloquence of false prophets and knavish architectural promoters and fakirs who came their way. For thus we would have been deprived of our illustrious inheritance, which apply cannot be taken from us now.

Fortunately for American architecture Sir Christopher Wren was what we would call in our vernacular, "all right." He had a good thing, an inexhaustible mine for supplying ideas for all manner of buildings, and he worked it for the best interests of all concerned. His reputation and success has created many a modern, would-be Wren to dare to try the experiment of some rival kind of architecture. Such is the aspect we have now of the late H. H. Richardson and his Romanesque style.

Trinity Church in Boston was a superb design when it was finished, and continues to be so to-day. But its best influence, I fear, has been perverted for ever. A quarter of a century ago Richardson was hailed as an apostle equal to Wren, and America went mad not in a Romanesque revival but in a carnival of it, by which I mean to say it was burlesqued. It is sad to reflect that such a genius as the man who designed the church in Boston should have allowed himself to succumb to the wiles of the flatterers enough to be drawn into the disgraceful saturnalia which followed so close upon his brilliant debut.

Now the home of the Romanesque was not Florence. It pretended to nothing of the court of Lorenzo the Magnificent, which, if it stood for anything, was elegant living. Mediæval, benighted south of France was the home proper of the Romanesque, and its proper medium of expression, churches, cloisters and monasteries. What could such a style of architecture contribute to the Anglo-Saxon home? Absolutely nothing. And when Trinity Church was finally completed Richardson had practically exhausted everything there was in the newly borrowed style. He could have gone on, probably, raising ecclesiastic edifices, designing an occasional library or two in good form without directly cribbing from his masterpiece; but neither he nor his imitators—and they were legion—cared a fig for the ethics or proprieties of architecture. They appear to have been actuated alone by the same principles of expediency which govern the "new art" movement. They invented an exaggerated architectural grammar without doubt derived from the old monasteries in the south of France, but so vulgarised as to establish a clear case of libel for those eminently respectable prototypes. This grammar the rabid reformers proceeded to apply to every kind of secular building in America, finally, to American dwelling-houses themselves. They did not reckon with their grandparents for an instant, not they. They apparently took the keenest delight in walking rough-shod over every sacred home memory. They openly insulted the very ancestors to whom they owed existence. But the balance of good and evil there is in the world cannot be disturbed so suddenly or arbitrarily. Outraged history was not slow to assert itself, and after a while would have no more of "Richardson Romanesque."

#### SOCIETY OF ENGINEERS.

At a meeting of the Society of Engineers held at the Royal United Service Institution, Whitehall, on Monday evening, December 1, Mr. Percy Griffith, president, in the chair, a paper was read on "The Depreciation of Plant and Works under Municipal and Company Management," by Mr. Charles H. W. Biggs.

The author commenced by observing that the question of municipal and companies' accounts, and especially depreciation, had been largely debated of late, and though non-technical, the subject might have some interest to the members of a technical society. The designs of engineers, especially such as required the use of iron and steel, played a considerable part in the question of depreciation, in that the life of the structure in which those materials were used depended upon the life of that part of the material used according to the factor of safety adopted. He pointed out that there was a tendency among modern engineers to use too low a factor of safety, which meant a higher rate of depreciation than when a higher factor was adopted.

The debt of the local authorities of this country, he said, was now about 300,000,000*l.*, which, at 3½ per cent. per annum, meant about 10,500,000*l.* a year for interest. The whole of that capital was obtained upon the condition that a certain definite part must be repaid annually. That capital was expended upon two classes of work, non-productive and so-called productive, the latter producing a revenue, though not necessarily a profit or a loss. He observed that the most obvious charges upon an undertaking were:—(1) Interest; (2) repayment of capital; (3) depreciation; (4) maintenance, and (5) working. Item 3 had been the most severely criticised of all the charges, and it was held by a very influential and numerous class that, in addition to maintenance and repayment, depreciation was absolutely necessary to place municipal undertakings upon a sound financial basis. He would assume the undertaking to be a tramway. If maintenance meant keeping the works efficient out of revenue, and depreciation as well as repayment was required, then revenue must earn during the period over which repayment extended a threefold equivalent of capital. The author pointed out that depreciation as applied to municipal undertakings was not founded upon a logical principle. Repayments extended over an arbitrary period, decided by a government department, but usually the period was in his opinion too short, and the rates of repayment therefore too rapid. As at present carried out, it imposed far too heavy a tax upon the first users for the benefit of subsequent users.



Companies' capital, he observed, should, for the purposes of comparison, be considered independently of the question of promotion money, or watering or any of those incidental deductions that really took place in practice, in which case the whole of the capital was available for the cost of the work. That capital remained constant, but careful examination would show that, revenue being sufficient, it was repaid as in the case of a municipality, though the period of repayment might be different. Thus, he would take the interest on gilt-edged securities as a standard rate of interest, and assuming that to be 3 to 3½ per cent. per annum, and assuming that 6 per cent. per annum was the amount necessary for dividends, he thought that we surely might look upon any dividend over 3 or 3½ per cent. as equivalent to the repayment of the loans in the case of a municipality. That it had not been so considered up to the present time was no proof that it was not so. If the company provided adequately for depreciation its revenue might then be split up in the same way as that of a municipality, viz.:—(1) Interest; (2) repayment; (3) depreciation; but with this difference, the company would get all the revenue possible, while public opinion would compel a municipality to pay more consideration to users in regard to their charges. That a threefold tax was imposed on users might be seen from actual examples. Aberdeen in four years paid to sinking fund 3,380*l.*, to depreciation and renewals 6,774*l.* Bolton had paid 16,397*l.* to sinking fund account, and 32,596*l.* to depreciation and renewals account. In conclusion, the author observed that an examination of further figures showed a lack of uniformity, but it abundantly proved that, under the existing system, the revenue had to be maintained at an excessive rate to the detriment of the present users.

#### GLOUCESTERSHIRE ENGINEERING SOCIETY.

THE annual meeting of the Gloucestershire Engineering Society was held on the 25th ult. at the Municipal Schools, Gloucester, when the president (Mr J. D. Humpidge, M.I.M.E.) presided over a good attendance of members.

In the course of his presidential address Mr. Humpidge gave a brief review of the advance made during the past few years in the many different departments controlled by mechanical engineers, and in other branches of engineering intimately connected with them. The President said that everyone nowadays was agreed as to the importance of keeping oneself well up-to-date in all that was going on, and indeed the only way to advance was to be well posted in what other people were doing and then try and "go one better." English engineers had been accustomed for such a long time to consider themselves easily first in their profession that they had been a little inclined perhaps to rest on their laurels while other nations had been advancing, with the result that they now found their position of proud supremacy threatened if not actually taken from them. They had had plenty of proofs of this; they had American locomotives running in our colonies, and even on some of our railways, and many of the orders for engines, bridges and material required for our colonies were going to the same country or to Germany. The fastest passenger steamers in the world were built or belong to Germany, and with many of them their own workshops showed only too plainly that in machine tools the Yankees had in many directions got well ahead of them. What was the remedy? People had told them they would never get on unless they adopted American methods. Such advice was all very well, but those who offered it forgot that to adopt it would simply place them on a level with those they imitated. What was required was something more than this. Let them study the methods employed in America, Germany or elsewhere, and then, aided by their own experience and the knowledge thus obtained, let them try and strike out in improved methods, never forgetting that he who imitated never got level with the one who originated, and it was only the first in the race who won. It could never be too thoroughly remembered that the vast development in engineering work that had been going on in recent years, and which was still going on at an ever-increasing rate, was producing a most important change in the conditions under which engineers had to work. In olden days an engineer had comparatively few customers, and for those customers he had to carry out practically everything they required in the way of machinery. Repetition work of any kind was rare, and success depended on his resourcefulness and ability to make anything that was required and make it work to his customer's satisfaction. Nowadays the successful engineer was not the one who made the many things for the few, but the one who, centralising all his ability on one or two articles, was able to turn them out in the most perfect way at a very much reduced cost. This same factor was operating similarly among engineering artisans. In former days the most valuable workmen were good all-round millwrights, who could use a plane, file or hammer and chisel, or work a lathe

or other machine as required; as they themselves used to put it, they were equally at home in wood, iron, stone or anything. Fine old fellows they were; one met them occasionally even now in country places, but in engineering centres they were practically extinct. Having dealt with some recent examples of progress in railway, marine and electrical engineering, motor cars, engineers' machine tools and internal combustion engines, the President, in conclusion, said he had spoken of the competition of foreign engineers, which was being felt more and more keenly every year, and he could only add that it was in the hands of such as those present—he was speaking specially to the younger members of their Society—to settle whether English engineers were to take the first place in the engineering world of the future or not. By technical education of every kind, by studying the best methods and appliances in use, and by adapting and improving on them wherever possible; by carefully noting the introduction of any new machines or methods, and by mixing with other engineers and exchanging ideas with them, and, finally, by specialising as far as they could, and so rendering themselves specially valuable in the particular department they selected—these were a few of the methods by which they should hold their own, and perhaps gain back some of the ground they had lost.

On the proposition of Mr Alfred Slater, seconded by Mr R. Read, and supported by Mr. F. G. Wright, a hearty vote of thanks was passed to the President for his very able and interesting address.

Several letters of apology for inability to be present were received from, among others, the past president, Mr. Hamilton Kilgour (whose father was too ill to permit of his leaving Cheltenham for the evening), and the secretary, Mr J. C. Cooke. Mr. W. A. Walton kindly acted for the secretary, and a vote of sympathy was passed with Mr. Kilgour. Mr. R. A. Lister was elected an honorary member of the Society.

At the conclusion of the meeting Mr. Alderman F. G. Wright, now mayor of Swindon (one of Gloucester's boys), was heartily welcomed on his first appearance as a vice-president of the Society, and congratulated on his elevation to the important post of loco superintendent at the Swindon works of the Great Western Railway.

#### TESSERÆ.

##### The Houses of Athens.

ON reading a description of Athens, our ideas relative to the luxuries supposed to have existed there must be entirely changed; for we find that the houses of its inhabitants could be reckoned only cottages, when compared to those of London or Paris. Yet some modern writers pretend that the interior of these simple and confined dwellings displayed the most magnificent furniture and decorations. But to destroy such vain and futile conjectures, it is sufficient to quote an assertion of the orator Lysias, who was perfectly acquainted with the state of Athens and the fortunes of its inhabitants. Very few houses in the capital, says he, are furnished at an expense exceeding a thousand drachmæ or thirty pound sterling. From this estimate we can scarcely suppose common necessities, much less any traces of profusion. Athens abounding in manufactures and peopled almost entirely with artists, was in reality the workshop of luxury, but not of habitation. Neither was Rome, during many centuries, the scene of ostentation. Pliny informs us that in his time the Romans constantly transported the finest statues and most beautiful paintings to decorate their country houses; and lamented that such immortal productions should be exiled from the capital to shine only in retirement. But the ideas of Pliny on this point are nothing more than illusions; for no just reason can be assigned why those citizens, who had collected at a great expense the most precious monuments of the fine arts, should be obliged to place them in some quarter of the capital rather than in a Latin village. Among such retreats their possessors had most probably received existence, and their hearts experienced still a thousand endearing attachments, either to trees planted by their infant hands, or fountains they had embellished in the bosom of some smiling vale. The Athenians in like manner consumed a great part of their fortune in ornamenting those habitations called *eschariæ* which were scattered throughout Attica. But as the functions of senators, archons and areopagites required their residence in the capital, they possessed likewise town houses, as much neglected as those of the country were adorned. Citizens of Athens, exclaimed Pericles, you have banished every generous sentiment and are occupied alone in erecting different works to increase the ostentation of your gardens.

##### Notre Dame, Calais.

The early church seems to have been mainly, if not altogether, built of stone, and in the fifteenth century to have been completely transformed on the exterior. The whole of the later work was executed in brick, of the common light color.



of London stock bricks, very roughly and coarsely executed. Large brick buttresses and pinnacles flank the principal fronts; the window jambs and arches are of moulded brick, but have lost their traceries, which were probably of stone; and a continuous arcade of intersecting brick arches is carried all along the parapets. By far the most important part of the work is the central steeple. This is of magnificent size, so broad, massive and stately as to give unusual dignity to the whole building. It is divided into three bays in width, on each side, by brick buttresses, with brick pinnacles in front of them, and the lines of the three belfry windows on each side are continued down in the form of panelling in the lower stage. The parapet is arcaded in brick, and from behind it rises a spire with four octagonal pinnacles at the angles; the sloping roofs of these, as also the spire itself, are all built of brick. Unfortunately, the spire is truncated, and is finished with an insignificant slated spire rising from within it. It was pierced in the fashion of the spires of this part of France, with traceried openings below and quatrefoiled circles above, which are executed partly in stone and partly in brick. Stone is also used generally here for the projecting string-courses and mouldings, but the weatherings of buttresses and the slopes of the gables are nearly all of brick, set at right angles to the slope in the usual fashion. The old lighthouse at Calais is similarly all built of light-coloured brick, but is so damaged and decayed as to have little architectural value.

### Egyptian Sculpture.

The characteristics of Egyptian sculpture are very peculiar. It exhibits extreme simplicity of design, great breadth of treatment, to the exclusion generally of minute details, and a solid largeness of form. There is little or no variety of expression in the heads, especially of the superior personages represented; a benignant, placid smile appears on all the countenances. Where dress is introduced there is no composition of drapery in the way of movement, nor any indication of folds. The action of the figures, however important or exciting their occupation, is limited by the most severe conventionalism. If sitting or standing, they have the legs parallel, the arms close to the sides, while the heads always look directly in front. Our national collection of antiquities boasts some extremely valuable examples of Egyptian sculpture, and the student may easily consult original specimens, by which he may become acquainted with the style of art of this extraordinary school. Considering the great antiquity of the Egyptians and their long duration as a nation, taking into account, too, the various fortunes of the country both from their own conquests and from the invasion of foreigners, it is remarkable how little change occurred in the leading characteristics of their art. Whether the monuments be of the most remote archaic period or of the more recent ante-Roman time, no sufficient alterations were introduced to destroy that peculiar and distinctive character which stamps all Egyptian art with its national individuality. Certain antiquaries have attempted to define marked epochs in the history of Egyptian sculpture, but though certain changes may be detected in the mode of representation in monuments attributed to different dynasties, they do not afford sufficient authority for anything like a strict chronological classification. From the high finish and more careful execution of the works of the time, it is thought that the national prosperity and therefore the condition of art were highest during the reign of Rameses, about 1350 B.C., and, judging from other remains, that the country and its art were most depressed from the date of the Persian conquest; that is, from 525 to about 344 B.C. Of the latter fact there cannot be any doubt, and although the nation freed itself after a time from the hateful rule of Persia, Egypt never again recovered its ancient renown, nor did she long retain her national independence.

### Roman Palaces.

Rome has more palaces, or noblemen's houses, than any other city in the world. Of these no fewer than seventy-five are of a superior kind, uniting in their external appearance something of the fortress, the prison and the palace. Many of the families to which these buildings once belonged have sunk into poverty and their residences are now turned into ecclesiastical colleges or hotels or let to foreign ambassadors or consuls. In the others which have escaped this fate the lower storey is sometimes let for shops, sometimes retained for tables, coachhouses and servants' rooms. The second storey is generally a picture gallery, consisting of a suite of rooms opening into one another and richly adorned with marble columns and painted ceilings. The owner of the building and these precious works of art often lives in the third or highest storey, and generously throws open the gallery to artists and all who choose to give two or three paoli to the servants. The exterior of these palaces is in general grand and magnificent in architecture; but in the interior, notwithstanding the magnitude of the apartments and the magnificence of the decorations, they are, generally speaking, uncomfortable dwellings, and most of them are deficient in cleanliness and

order. The immense palaces of the Doria, the Colonna and the Borghese are still occupied only by their own families and dependents. The Doria palace contains the largest collection of paintings in Rome, among which are found some of the finest specimens of the ancient masters. The gallery of the Colonna palace, which is by far the grandest hall in the city, once contained a number of celebrated paintings, but the finest have been sold. The palace garden, which hangs on the steep side of the Quirinal Hill, contains the picturesque remains of a magnificent ancient edifice, the name of which is unknown. The palace of the Barberini family formerly contained that celebrated museum of ancient sculpture, vases, gems, medals, &c., which was so long the wonder and admiration of Europe, but it is now sold and dispersed. The famous Portland vase was brought from this museum. There are still some interesting pictures. The palace of the Borghese once contained a fine museum of sculpture, and lately possessed one of the best collections of paintings in Rome. In the Palazzo Massimi is the famous "Discobolus," found in the grounds of the Villa Palombari on the Esquiline Hill. The Palazzo Spada contains the celebrated statue of Pompey, at the foot of which Cæsar fell. In the palace of the Braschi once stood the beautiful colossal statue of Antinous, which was dug up on the site of the ancient Gabii, and has been removed to the Lateran museum. The Palazzo Nuovo di Torlonia, the residence of Torlonia the Roman banker, who purchased the title and estate of the Duca di Bracciano, is fitted up with all the magnificence that wealth can command. The gallery is adorned with Canova's colossal group of "Hercules and Lycas." The Farnese palace contains the far-famed gallery painted in fresco by Annibal Carracci. In the gallery of the Sciarra palace are Raphael's "Player on the Fiddle," Leonardo da Vinci's "Vanity and Modesty," and other masterpieces.

### Red and Black Greek Vases.

At the end of the sixth century B.C., towards the period of the fall of the successors of Peisistratos, the painters of Athens made a marked innovation when they replaced the black figures on their pottery by red figures. The black figures, which remind us a little of *ombres chinoises*, and the cheerfulness of which is very doubtful, were too opposed to the principles of the true and the beautiful to be any longer popular. They allowed of no expression in the faces. To indicate the anatomy it was necessary to have recourse to the stylus and to incise the lines. The details could only be obtained by picking out in white or purple. This drawback disappears when the figures are in a light tone, and stand out from a black background. A mere stroke of the brush then suffices to trace the anatomical details or the folds of the costume. We owe the most admirable productions of Greek painting to the invention of the red figures. It seems, moreover, that the change was very speedily effected, for the vases which combine the two styles—both the black and red figure styles—are very rare. At the head of the painters in red figures stands Euphronios, the greatest of the Attic masters. He stood in the same relation to Greek art as the artists of the fourteenth century stood to the Renaissance. In one respect he belongs to the old school, of which he retains certain traditions—the harshness of drawing, the fear of rounding the angles and of filling up the forms of the body; and that laborious patience which neglects neither a curl of the hair nor a fold of the drapery. But his style is of incomparable breadth, and so far beyond anything ever produced in pottery that his hand may at once be recognised even on vases he has not signed. The personages are alive, the composition is easy and natural, with a slight search for grace; he excels in variety of pose and in the play of expression. Kachrylion, his fellow-worker Hermaios, and Hieron have not the same talent, but like him they know their business. In their hands the clay becomes as plastic as wax, the lines are as fine as a silken thread, and the outlines are drawn with wonderful precision. Only two vases by Hermaios remain. They were intended as companion pieces, a thing very difficult to meet with, even in ordinary vases.

### Lares and Penates.

Penates and Lares were in universal usage among the Romans, and were regarded as the tutelary deities, under whose immediate protection the person, the house, family and possessions of every individual were placed. There were not only "Lares domestici et familiares," but "Lares urbani, rurales, viales, compitales, marini," &c. Some writers have thought the Lares and Penates to be the same, and it would appear that the Lares were included among the Penates. The Lares, however, were of human origin, and appear to have been regarded by the Romans as the manes of their ancestors, while among the Penates we find mention of the superior gods, as Vesta and Jupiter. The divinities were represented by small statues, seldom exceeding a very few inches in height, exquisitely proportioned and wrought and cast in gold, silver and bronze, but the intrinsic value of the first-mentioned materials has occasioned their almost total disappearance. It



was customary with the Romans, when travelling, to carry the Penates with them that they might not omit the usual sacrifice should any festival happen during their journey. When they returned home these images were deposited in the lararium or wardrobe, which stood in some secret apartment, the sleeping room or library. In process of time the Romans were not content with a single lararium but had another containing statues of heroes, poets and eminent men, and even of their patrons. The superstition attached to these small statues was so great that men of the first rank and celebrity did not neglect the usage of them. We have instances in the lives of Antiochus, Xenophon and Cicero. The hearth of the atrium was sacred to the Penates, and as this place was the innermost or most important part of the house it was called the penetralia. There appears sometimes to have been a kind of recess in the wall called sacrarium, in which the images of the Penates were kept. Every master of a family was the priest to the Penates of his own house.

#### Roman Sculpture.

It was not till after the conquest of Greece and the arrival of the enormous collection of works of art brought as plunder and spoil to grace the triumph of the conquerors on their return to Rome that sculpture began to attract any marked attention there. Syracuse yielded up its treasures of art after the conquests of Marcellus, Corinth had been stripped of its wealth in art by Mummius, and Athens also had largely contributed her share of exquisite works in sculpture to enrich the Roman capital. It became a fashion to form collections, and to this caprice modern times are indebted for the preservation of some of the finest productions of Greek art. Verres has been handed down to posterity as one of the most ardent and, it must be added, least scrupulous of collectors, but his anxiety to obtain possession of the most exquisite works of the great masters doubtless occasioned many to be carefully preserved which otherwise would have been neglected or destroyed. In the century preceding the birth of Christ several sculptors of eminence, all having Greek names, were practising in Rome. Both Julius Cæsar and Augustus appear to have made efforts to preserve fine ancient works and so far gave opportunity to the Romans to acquire a taste for art. Augustus, especially, formed collections of statues and other objects of taste, and set an example in this respect that was followed by many of the rich and influential. During the reign of this emperor are found the names of some of the most eminent artists of antiquity—Posidonius, the architect Vitruvius, and Dioscorides. The gems of the latter are among the finest specimens of the art. Nero had statues imported from Greece, and it is astonishing that, notwithstanding the extent to which the country had already been plundered, it is recorded that no fewer than 500 bronze statues were procured from the Temple of Apollo at Delphi.

#### Assyrian Art.

There is no reason why we should not assign to Assyria the same remote antiquity we claim for Egypt. The monuments of Egypt prove that she did not stand alone in civilisation and power. At the earliest period we find her contending with enemies already nearly, if not fully, as powerful as herself, and amongst the spoil of Asia and the articles of tribute brought by subdued nations from the north-east are vases as elegant in shape, stuffs as rich in texture and chariots as well adapted to war as her own. It is not improbable that she herself was indebted to the nations of Western Asia for the introduction of arts in which they excelled, and that many things in common use were brought from the banks of the Tigris. In fact, to reject the notion of the existence of an independent kingdom in Assyria at the very earliest period would be almost to question whether the country were inhabited, which would be directly in opposition to the united testimony of Scripture and tradition. A doubt may be entertained as to the dynasties and the extent of the empire, but not as to its existence; that it was not peopled by mere wandering tribes appears to be proved by the frequent mention of expeditions against Naharaina (Mesopotamia) on the earliest monuments of Egypt and the nature of the spoil brought from the country.

#### The Character of Wren.

Sir Christopher Wren was of low stature, his forehead broad and fair, his nose slightly aquiline, the eyes large and expressive and the whole aspect stamped with intelligence and talent. He was light and active of body, walked with a certain stateliness of air, and his constitution, rather delicate than robust, was saved, it is said, from consumption by habits of regularity and temperance. That he was a little man, a tradition preserved by Seward sufficiently shows. Charles II. on walking through his newly erected hunting palace at Newmarket, said, "These rooms are too low." Wren went up to the king and replied, "An please your Majesty, I think them high enough." Whereupon Charles, stooping down to Sir Christopher's stature, answered with a smile, "On second thoughts I think so too." He had that calm and philosophic temper which contradiction could not disturb; he heard his opinions questioned, and even

saw his designs deformed by the envious or the ignorant without change of mood or a snappish remark. That he shed tears when the Duke of York rejected the best and adopted the worst plan of St. Paul's showed that on great occasions he could not always quite command his feelings; but this will take little from the justice of his son's eulogy when he says "he had such wonderful sweetness of temper, such a steady tranquillity of mind and such pious fortitude that no injurious incident or inquietudes of human life could ever ruffle or discompose Sprat, who is accused of saying fine things of his friends for the sake of saying them, was not suspected of overpraising Wren when he wrote, "His knowledge had a right influence on the temper of his mind, which had all the humility, grace, modesty, goodness, calmness, strength and sincerity of a sound and unaffected philosopher—to his merits his country is further indebted than has been acknowledged." But even if the eulogiums of children and friends should be suspected, the silence of his enemies is praise sufficient; that his long life was eminently useful, virtuous and blameless, no one has questioned. His experiments in science have since been eclipsed by brighter discoveries, but there can be no doubt that he showed an inventive way to much that has since been achieved. His invention was fertile, his ingenuity exquisite and his application unbounded; he could equally attend to the minute and explore the profound, discuss questions of geometrical nicety or speculate like a poet on the possibilities of existence in remote worlds. To him many ascribe the invention of mezzotint engraving, commonly imputed to Prince Rupert; and the annals of the Royal Society are filled with his experimental studies and inventions in philosophy and science. He had some skill in drawing landscape; his view of Windsor was engraved by Hollar, and eight or ten plates from Willis' "Anatomy of the Brain" were from his pencil. He was the inventor of drawing pictures by microscopic glasses; he found out a speedier way of etching, and it should not be omitted that he displayed some skill in verse, though nothing that entitles him to the distinction of a poet. His early prose compositions were in that elaborate and ornate style of which Sidney has given enough in his "Arcadia," but when his judgment ripened and experience and study had stored his mind with knowledge he wrote in a clear and unembarrassed manner and communicated what he had to say like one less solicitous about his language than his thoughts. Sometimes, no doubt, he relapsed for a sentence or two into his original sin of stilted composition, but nature soon regained her sway. We trace in all his writings the practical man, the man of sense, sagacity and observation; he set his face against all romantic views of subjects, ridiculed the proneness of some of his brethren for prognostications, and laid it publicly down as a rule that "experiment and reason is the only way of prophesying events."

#### GENERAL.

**The Dublin Exhibition** of "Old Masters" will be opened by the Lord Lieutenant on December 15. The collections of the Duke of Leinster, Lord De Ros and Sir Algernon Coote have been freely placed at the disposal of the director, Mr. Lane, and many fine and hitherto unknown pictures have thus been secured. There will be at least nine Sir Joshuas, seven Romneys, three Gainsboroughs, four Lawrences and some remarkable works of Lancret and Greuze, besides many good works of Irish artists.

**Mr. A. S. Brickwell**, of the surveyors' department of the Great Northern Railway, has been appointed estate agent and surveyor of the Great Central Railway Company's property in London.

**The Exploration** of Miletus, under the direction of Dr. Wiegand, has been resumed. The discovery of a marble colonnade in which the columns must have been doubled has rewarded the efforts of the party. It evidently surrounded market-place. The foundations of a theatre have also been revealed.

**An Exhibition** of studies by John Constable, with works of various other English masters, is about to be opened in Elberfeld.

**Mr. J. W. Tyler** will read a paper at the meeting of the Surveyors' Institution on Monday next upon "Estate Duties, Valuations and Agricultural Property." The chair will be taken at 4 P.M.

**The Liverpool Cathedral Committee** met on Monday, when letters were read from the architects selected to submit the designs from which the final selection will be made asked for information and for photographs of the site.

**Mr. R. G. Hatton** will, on Wednesday next, deliver a lecture before the Northern Architectural Association on "The Ideas of the Advocates of Handicrafts; their Effect on Architectural Form and Ornamentation." "Coffee Smokers" are to be given by the President on December 10, January 10, February 4 and 18 at 9 P.M.

**Mr. Ellis Marsland** will read a paper on Thursday next before the Society of Architects on "Some Recent Conflagrations and their Lessons to Architects."







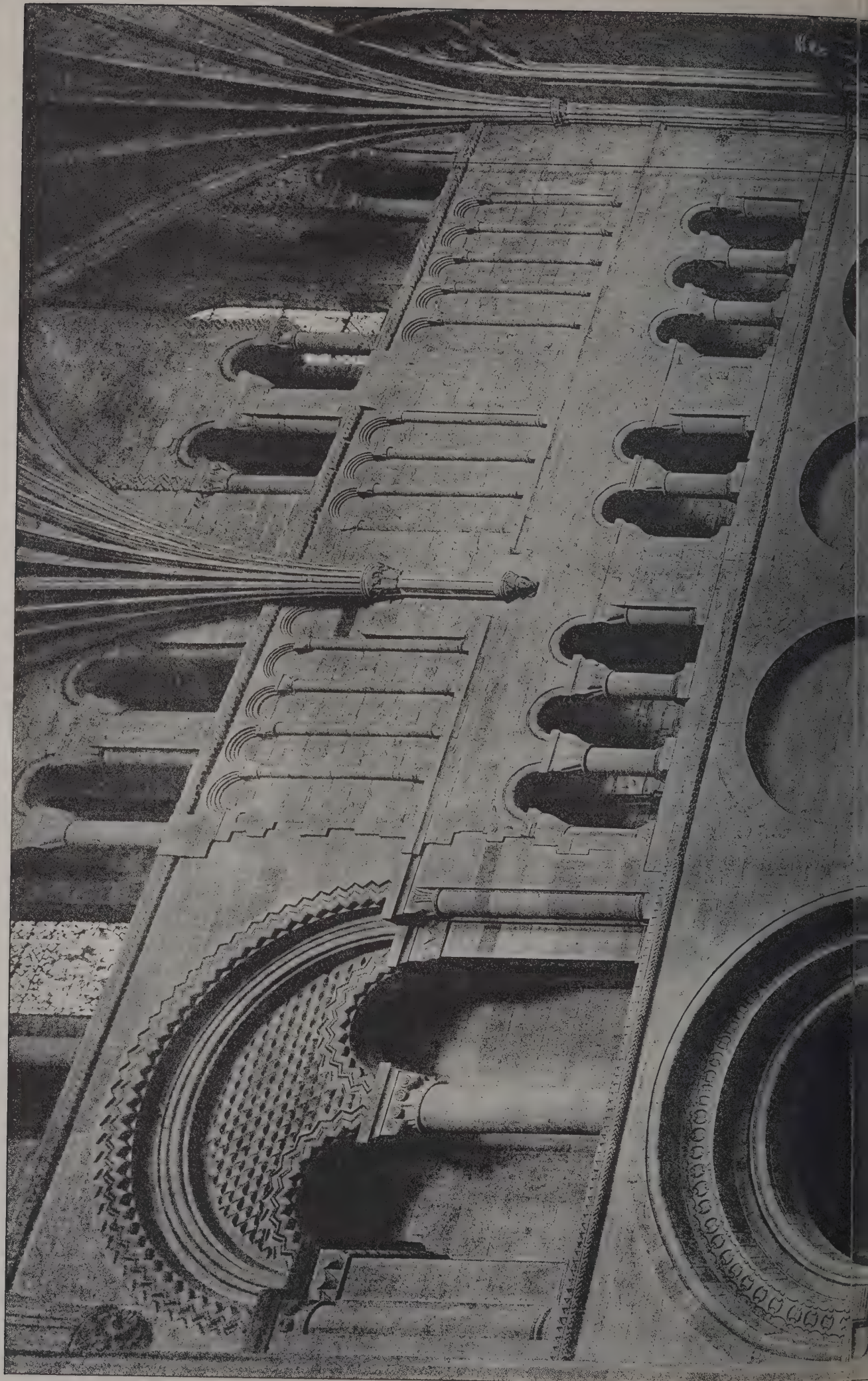
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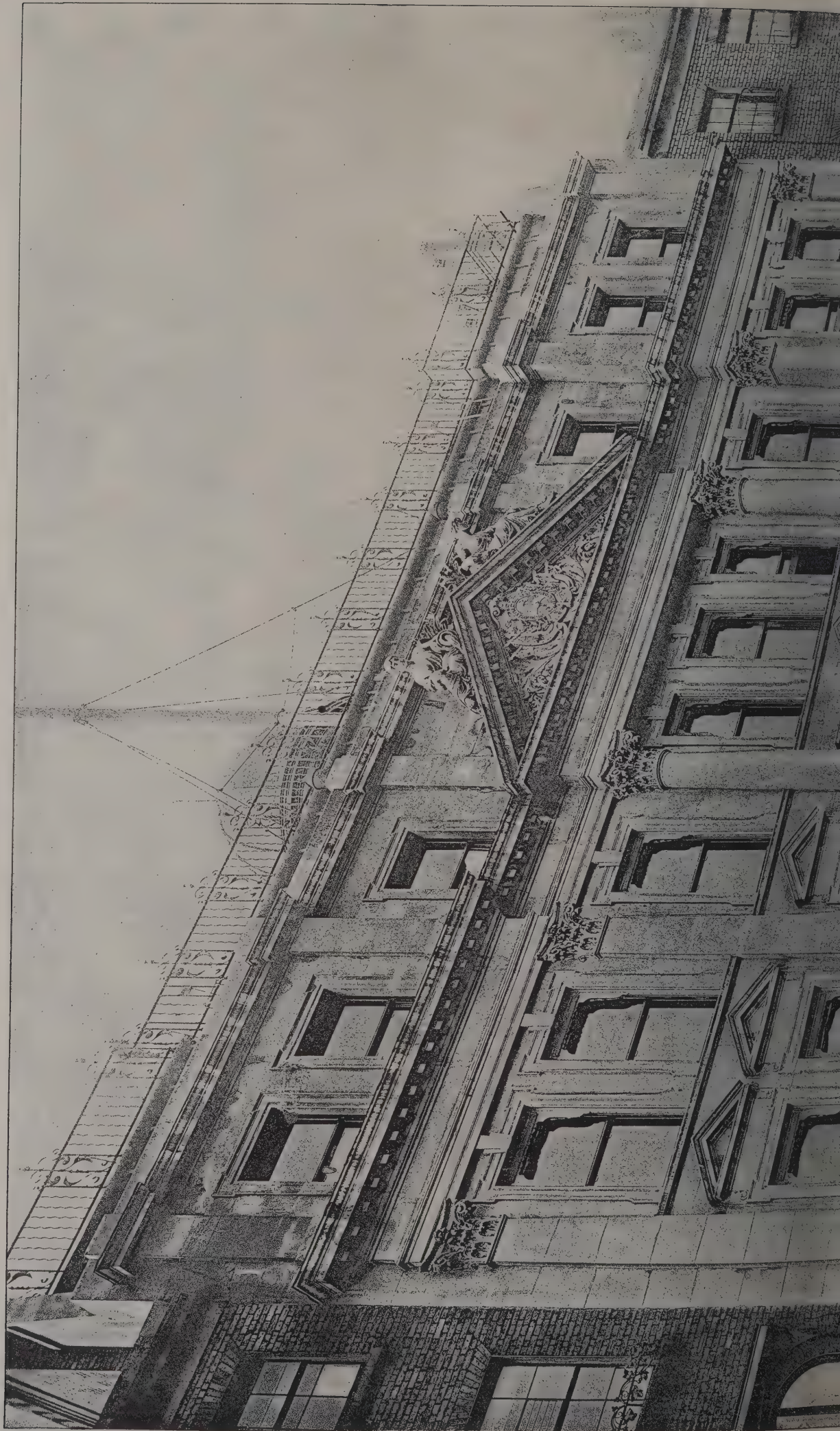




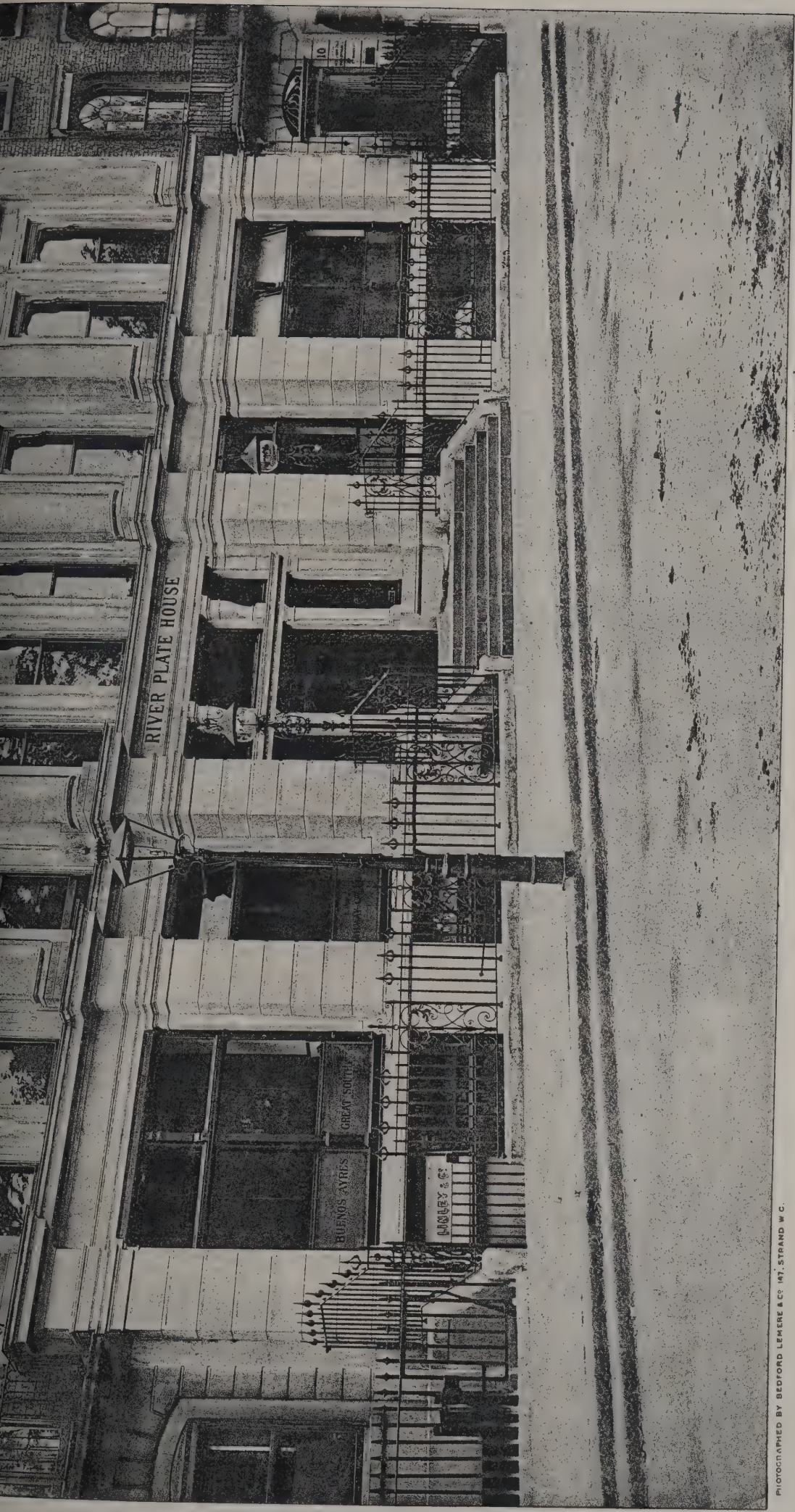




The Architect, Dec 5<sup>th</sup> 1902.







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THE

**Architect and Contract Reporter.****EDITORIAL NOTICES.**

*In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

**TENDERS, ETC.**

*\*\* As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

**COMPETITIONS OPEN.**

**ASHTON-IN-MAKERFIELD.**—Dec. 31.—Designs, &c., are invited for the enlargement of the Infectious Diseases Hospital. The architect whose plans are accepted and approved will be retained by the Council to carry out the work at the usual professional charges. Plan of the hospital site, together with full particulars of the alterations and extensions required, may be obtained from Mr. T. Burgess, surveyor, at the Council Offices.

**BRIDGWATER.**—Feb. 28.—Plans, specifications and estimates are invited in competition for power and appliances to deal with the accumulations of silt in portions of the river Parrett. Mr. W. T. Baker, town clerk, King Square, Bridgwater.

**CAPE TOWN.**—Jan. 31.—The Council of the University of the Cape of Good Hope invite designs for the erection of university buildings. Premiums of 400*l.*, 200*l.* and 100*l.* will be awarded to the authors of the designs placed first, second and third respectively. Particulars of the competition may be obtained on application to the Registrar at Cape Town, or to the Agent-General in London.

**DURBAN (NATAL).**—Dec. 18.—Design are invited for new town hall, library, museum, art gallery and municipal offices. Three premiums of 500*l.*, 300*l.* and 200*l.* respectively will be awarded for the three best designs in order of merit. Mr. W. H. Radford, C.E., Albion Chambers, Nottingham.

**ECCLES.**—Dec. 12.—Plans are invited for the laying-out of an area of land and for erection of dwellings for the working-class on part of such area. Premiums of 50*l.*, 30*l.* and 15*l.* will be awarded in respect of the plans placed first, second and third in order of merit. Mr. Wm. Henry Hickson, town clerk, Town Hall, Eccles.

**HULL.**—Jan. 31.—Designs in competition are invited for the extension of the town hall. Premiums of 300*l.*, 200*l.* and 100*l.* are offered. Mr. E. Laverack, town clerk, Town Hall, Hull.

**KINGSTON-ON-THAMES.**—Jan. 15.—Plans and designs are invited for a central home and cottage homes for children of both sexes in the Kingston Road, in the parish of New Malden. A premium for the first three selected plans of 25*l.*, 15*l.* and 10*l.* respectively is offered. Mr. Jas. Edgell, clerk, Union Offices, Coombe Lane, Kingston-on-Thames.

**SURBITON.**—Dec. 16.—Designs are invited for erection of a Coronation memorial clock tower near the refuge in the area fronting Surbiton station. Premium 10*l.* 10*s.* Dr. Coleman, chairman, clock committee District Council Offices, Surbiton.

**CONTRACTS OPEN.**

**ACCRINGTON.**—Dec. 13.—For erection of a parish-room at St. John's Church, Accrington. Mr. Henry Ross, 15 Cannon Street, Accrington.

**AUSTRALIA.**—Dec. 22.—For erection at Perth, Australia, of a rubbish destructor capable of dealing with forty tons of garbage in eight hours. Mr. W. E. Bold, town clerk, Town Hall, Perth.

**ASHFORD.**—Dec. 12.—For external painting and repairs to various properties, for the Ashford Urban District Council. Mr. John Creery, clerk to Urban District Council, 11 Bank Street, Ashford, Kent.

**ASHTON-UNDER-LYNE.**—For erection of a pair of houses in Taunton Road, Ashton. Messrs. Thos. George & Son, architects, Old Square, Ashton-under-Lyne.

**BARNESLEY.**—Dec. 8.—For pulling-down the present old buildings and erection of new clerk's offices, relief offices and relieving officer's house in Pitt Street, Barnesley. Messrs. Crawshaw & Wilkinson, architects, 13 Regent Street, Barnesley.

**BEVERLEY.**—For erection of Wesleyan Sunday schools, &c., at Beverley. Messrs. W. J. Morley & Son, architects, 269 Swan Arcade, Bradford.

**BEXHILL.**—Dec. 15.—For extension of engine-room, boiler-house and offices at the electric light works, for the Town Council. Mr. George Ball, borough surveyor, Town Hall, Bexhill.

**BEXLEY HEATH.**—Dec. 8.—For erection of car-shed buildings. Mr. T. G. Baynes, clerk, Urban District Council, Public Hall, Bexley Heath, Kent.

**BRADFORD.**—Dec. 8.—For alterations to the old car dépôt, Thornbury. Mr. Frederick Stevens, town clerk, Town Hall, Bradford.

**BRADFORD.**—Dec. 11.—For erection of three houses in Huddersfield Road, Wyke. Messrs. Fairbank & Wall, architects, Craven Bank Chambers, Bradford.

**BRADFORD.**—Dec. 13.—For erection of new central baths and public hall, Morley Street, Bradford. Mr. Frederick Stevens, town clerk, Town Hall, Bradford.

**BRIDLINGTON.**—Dec. 9.—For alterations to 3 Prince Street. Mr. J. Earnshaw, architect, Wellington Road, Bridlington.

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BRISTOL.—Dec. 10.—For erection of boundary walls and railings at Greenbank Cemetery, Bristol. Mr. T. H. Yabbicom, city engineer, 63 Queen Square, Bristol.

BURY (LANCS).—Dec. 13.—For erection of (1) brickwork for walls, arches and chimneys for six through beds of retorts; (2) ironwork for ditto, with stage flooring; and (3) coke storage hoppers at the gasworks. Mr. H. Simmonds, general manager, Gasworks, Elton.

CLITHEROE.—For erection of cottage, coach-house, &c., on the Standen Hall estate. Mr. E. Lovell Clare, 36 King Street, Clitheroe, Lancashire.

CONSETT.—For erection of a dwelling-house, &c., at Medomsley Road, Consett, Durham. Mr. William Ward, 47 Sherburn Terrace, Consett.

COWES.—Dec. 9.—For erection of a chimney-shaft at the waterworks pumping station. Mr. H. C. Damant, clerk, U.D.C., High Street, Cowes, Isle of Wight.

CREWE.—Dec. 10.—For erection of business premises at Crewe. Messrs. Dring & Manchester, architects, Market Chambers, Earlestown.

CROYDON.—Dec. 8.—For extension of the car-shed at the Brighton Road (Purley) depôt. Mr. E. Mawdesley, town clerk, Town Hall, Croydon.

DARLINGTON.—Dec. 15.—For erection of an ornamental bandstand (exclusive of base) at North Lodge park. Mr. W. George Winter, borough surveyor, Town Hall.

DEPTFORD.—Dec. 9.—For an addition to the Council's laundry at the public baths and washhouses, Laurie Grove, New Cross Road, S.E. Particulars can be obtained on application at the Borough Surveyor's Office, 493 New Cross Road, S.E.

DUDLEY.—Dec. 15.—For additions to the technical schools, Stafford Street, Dudley, and an underground convenience at the Market Place, Netherton. Mr. John Gammage, borough surveyor, Town Hall, Dudley.

EBCHESTER.—Dec. 10.—For alterations and additions to Blackhall Mill inn, Blackhall Mill, Ebchester, Durham. Mr. Geo. Thos. Wilson, architect, 21 Durham Road, Blackhill.

GLOUCESTER.—Dec. 20.—For alterations and additions to the Tuffley Board school, Gloucester. Mr. Walter B. Wood, architect, 12 Queen Street, Gloucester.

GREAT HARWOOD.—Dec. 10.—For erection of a stone wall on the north side of the gasworks, Great Harwood, Lancs. Manager, Gasworks, St. James Street, Accrington.

GREAT YARMOUTH.—Dec. 9.—For erection of proposed girls' home at the Hollies, Gorleston. Mr. Walter Lake, architect, Regent Street, Great Yarmouth.

HALIFAX.—Dec. 15.—For erection of an extensive block of high-class shops, showrooms, workrooms, &c., in Commercial Street, Halifax. Mr. W. Clement Williams, architect, 29 Southgate, Halifax.

HALIFAX.—Dec. 18.—For erection of nineteen houses at High Road Well. Mr. Medley Hall, architect, 29 Northgate, Halifax.

HOLBECK.—For alteration and additions to West End House, Holbeck, Leeds. Messrs. Buttery & Birds, architects, 1 Basinghall Square, Leeds.

HUDDERSFIELD.—Dec. 11.—For erection of two semi-detached villas in New Hey Road, Lindley. Messrs. John Kirk & Sons, architects, Huddersfield.

HUDDERSFIELD.—Dec. 17.—For erection of a Wesleyan church at Longwood. Mr. J. Berry, architect, 3 Market Place, Huddersfield.

ILKLEY.—Dec. 11.—For erection of a house at Ilkley. Mr. W. H. Herbert Marten, architect, Cheapside Chambers, Bradford.

IRELAND.—Dec. 13.—For erection of an auxiliary dispensary depôt at Carrigeens, in the Carney dispensary district of Sligo. Mr. P. J. Kilgallen, architect, Abbeyville, Sligo.

IRELAND.—Dec. 23.—For erection of a new Crown post-office at Limerick. Particulars may be obtained at the Office of Public Works, Dublin.

ISLE OF WIGHT.—Dec. 9.—For erection of a chimney-shaft at the Cowes waterworks pumping station. Mr. H. C. Damant, clerk, U.D.C., High Street, Cowes.

KETTLEWELL.—Dec. 9.—For erection of a boarding-house and shop at Kettlewell, near Skipton. Mr. James Hartley, architect, Skipton.

LAMBETH.—Dec. 10.—For provision of a separate doorway and other work at the dispensary, 112 Westminster Bridge Road, S.E. Particulars may be obtained at the Guardians, Offices, Brook Street, Kennington Road, S.E.

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**LAMBETH**—Dec. 10.—For erection of a pump-house at Renfrew Road workhouse. Mr. W. Thurnall, clerk to Guardians, Brook Street, Kennington.

**LEEDS**—For alteration and partial rebuilding of a small shop and office estate in Park Lane, Leeds. Messrs. Morley, 6 Wormald Row.

**LONDON**—Dec. 11.—For erection of the superstructure of the Victoria and Albert Museum at South Kensington, for the Commissioners of H.M. Works and Public Buildings. All information may be obtained at H.M. Office of Works, Storey's Gate, Westminster, S.W.

**LONDON**—Dec. 15.—For erection of a blacksmith's shop, &c., at the Wandsworth Borough Council's wharf, Ashlone Road, Putney Embankment. Particulars may be obtained at the Surveyor's Office, 4 High Street, Wandsworth.

**LOWESTOFT**—Dec. 15.—For construction of seven groynes and the lengthening of the four existing groynes upon the South Beach at Lowestoft, Suffolk. Mr. W. T. Douglass, 15 Victoria Street, Westminster, S.W.

**MALDON**—Dec. 17.—For erection of a ward block of 10 beds, administrative block and other buildings in connection therewith, at Maldon, Essex. Mr. P. M. Beaumont, architect, Maldon, Essex.

**MARGATE**—Dec. 8.—For construction of a new engine and boiler-house, engineer's shop, office, weighbridge, stables, engineer's house and four cottages at Uffington, one mile from Adisham station, on the main line of the London, Chatham and Dover Railway. Mr. Edward Brooke, town clerk, 18 Cecil Square, Margate.

**MIDDLESBROUGH**—Dec. 10.—For hot and cold water supply and heating for two new ward pavilion blocks at the sanatorium, West Lane, Middlesbrough, and for three ward pavilion blocks at the smallpox hospital, Hemlington. Mr. Frank Baker, borough engineer, Municipal Buildings, Middlesbrough.

**NORWICH**—Dec. 12.—For conversion of premises, 3 and 5 Magdalen Road, into a branch police station. Mr. Arthur E. Collins, city engineer, Guildhall, Norwich.

**PRESTON**—Dec. 11.—For erection of a hospital for infectious diseases, to contain twenty-six beds, at Fulwood, near Preston. Messrs. Seward & Rawcliffe, architects, 119A Fishergate, Preston.

**RHODESIA**—Feb. 26.—For establishment and working of an electric tramway system, Bulawayo. Messrs. Davis & Soper, 54 St. Mary Axe, London, E.C.

**SCOTLAND**—Dec. 8.—For erection of a dwelling-house on the farm of Banarach. Mr. Peter Fulton, architect, Forres.

**SCOTLAND**—Dec. 8.—For erection of goods shed and retaining walls at Banknock station, for the Kilsyth and Bonnybridge Railway Company. Mr. Henry Lamond, secretary, 93 West Regent Street, Glasgow.

**SKELMERSDALE**—Dec. 9.—For erection of a church at Skelmersdale, near Ormskirk. Messrs. Austin & Paley, architects, Castle Park, Lancaster.

**SOUTHAMPTON**—Dec. 17.—For enclosing corridor arches at the Incorporation Infirmary, Shirley Warren, Southampton. Messrs. Mitchell, Son & Gutteridge, architects, Portland Street, Southampton.

**STRATFORD-UPON-AVON**—Dec. 8.—For paperhanging and repairs at Wayfield House, Snitterfield. Mr. Roden Dixon, borough surveyor, Municipal Offices, Stratford-upon-Avon.

**TEIGNMOUTH**—Jan. 6.—For extensions and alterations at the gasworks. Mr. J. Alex. Gray, gas engineer, Teignmouth.

**TROWBRIDGE**—Jan. 5.—For erection of an isolation hospital for thirty patients at Trowbridge, Wilts. Mr. J. Hugh Goodman, architect, Town Hall Chambers, Reading.

**WALES**—For erection of a warehouse at the Bute Docks, Cardiff. Mr. Edgar G. C. Down, architect, 31 High Street, Cardiff.

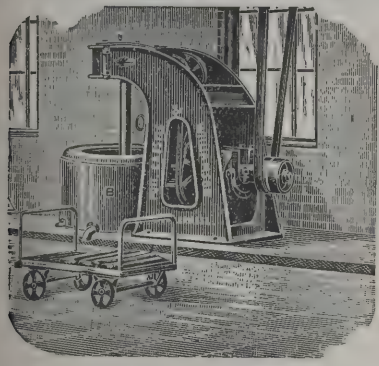
**WALES**—Dec. 11.—For erection of new accident wards at the Cardiff Infirmary. Mr. Edwin Seward, architect, Queen's Chambers, Cardiff.

**WALES**—Dec. 15.—For adding a third lift (100 feet diameter by 24 feet deep) to the present two-lift holder at the Treforest, Pontypridd, gasworks. Mr. Edward Jones, engineer, Treforest.

**WALES**—Dec. 16.—For erection of a new infants' school vice the present Ynyscedwyn infants' school, on a field near the rectory, Ystradgynlais, to accommodate about 180 scholars. Mr. Philip Williams, architect, Ty'r Gorof, Ystradgynlais.

**WALES**—Dec. 17.—For additions to Dock Road Brewery, Newport, Mon. Mr. F. Phillips, Dock Road Chambers, Newport.

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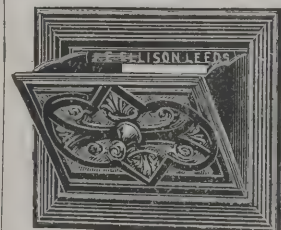
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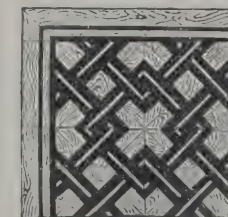
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**WHITEHAVEN.**—Dec. 8.—For altering and repairing the interior of the baths and washhouses. Mr. Thos. Brown, town clerk, Town Hall, Whitehaven.

**WIGAN.**—Dec. 27.—For erection of fourteen cottages in Ellis Street and eleven in Eckersley Street, off Whelley. Mr. Harold Jevons, town clerk, Municipal Buildings, Wigan.

**YORK.**—Dec. 31.—For erection of a lunatic asylum at Water Fulford, near the city of York. Mr. A. Creer, architect, Guildhall, York.

## TENDERS.

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For steel roofwork, &c., in connection with new swimming-bath.

ROWLINSON & Co., Chancery Lane, W.C.  
(accepted) £244 0 0

### AXBRIDGE.

For widening of Sidcot Lane, in the parish of Winscombe, and for erection of a new fence, &c. Mr. GEO. A. MILLARD, district surveyor.

J. Coles	£159	0	0
M. Atwell	145	0	0
S. Shepstone	135	10	0
Lloyd & Son	120	0	0
A. G. WEEKS, Winscombe, near Weston-super-Mare (accepted)	110	10	0

### BARNES.

For supply and fixing of about 1,447 yards of wrought-iron fence, with gates, stays, pillars, &c. Mr. G. BRUCE TOMES, surveyor, High Street, Mortlake, S.W.

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Jukes, Coulson, Stokes & Co.	1,245	0	0
A. E. Wood	1,240	0	0
J. Priest & Son, Ltd.	1,237	3	8
W. Haywood & Sons, Ltd.	1,200	0	0
W. Miller & Sons	1,170	0	0
Bayliss, Jones & Bayliss	1,114	7	0
Bain & Co.	1,092	9	0
J. Elwell	995	16	0
E. J. RAYBOULD & Co., Workington (accepted)	966	19	3

### BARNESLEY.

For additions to house at Bloomhouse Green, Darton. Messrs. R. & W. DIXON, architects, 5 Eastgate, Barnsley.

#### Accepted tenders.

J. W. Hampton, builder	£164	0	0
J. Thornley, carpenter and joiner	63	0	0
E. Fleming, plasterer and slater	33	0	0
E. S. Ledger, Staincross, plumber and glazier	11	3	0
Beaumont Bros., painter	3	15	0

### BIGGLESWADE.

For erection of three villas in Fairfield Road. Mr. T. COCKRILL, architect, Market Square, Biggleswade.

W. E. French & Co.	£1,020	0	0
C. Wright	930	0	0
Stones & Skelton	917	0	0

### BRADFORD.

For rebuilding a warehouse and offices in Thornton Road, Bradford. Messrs. FRANCE, MILNES & FRANCE, architects, 99 Swan Arcade, Bradford.

#### Accepted tenders.

Jackson Bros., Mannington, mason and joiner.  
R. Townend, Bradford, plumber.  
Hill & Nelson, Bradford, slater and plasterer.  
J. W. Walton, Frizinghall, painter.

### BRIERLEY HILL.

For erection of a technical school and free library at Brierley Hill, Staffs. Mr. J. LEWIS HARPER, architect.

A. & S. T. Bishop	£5,365	0	0
W. Hopkins	5,300	0	0
Sapcote & Sons	5,267	0	0
Brooks & Tandy	5,120	0	0
J. Herbert	5,014	0	0
Meredith	4,978	0	0
F. L. Jones	4,965	0	0
Griffiths	4,805	0	0
Dallow	4,700	0	0
Guest & Sons	4,650	0	0
Oakley & Coulson	4,627	0	0
C. A. NORTON, Brierley Hill (accepted)	4,457	0	0

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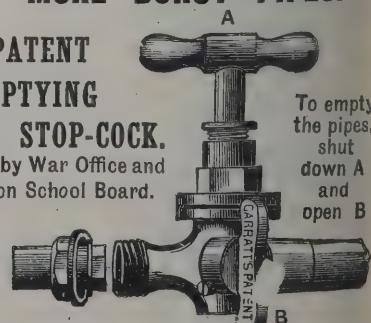
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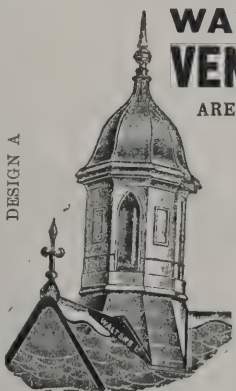
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**HORSHAM.**

For repairs, painting, &c., to the Dog and Duck inn and the adjoining cottages at Warnham. Mr. C. H. BURSTOW, architect, 6 West Street, Horsham.

Shaw Bros.	£74	10	0
Hillman & Murrell	43	13	0
G. Potter	39	10	0
W. Potter	38	0	0
W. Roser	36	10	7
W. Street	35	0	0
G. Chesswas	34	10	0
J. WALDER, Warnham (accepted)	31	10	0

**IPSWICH.**

For (Specification No. 9), the supply of mains, switchboard, motor boosters, and connections in generating stations; (10) overhead construction for tramways.

*Accepted tenders.*

(Specification No. 9) Allgemeine Elektrizitäts-Gesellschaft, Berlin, £2,833.  
(10) British Electric Equipment Company, London, £9,301.

**IRELAND.**

For street and sewerage works in a new road from Farrar Road across Tanralt and the Bishop's Park to the bottom of Love Lane, Bangor. Mr. JOHN GILL, borough surveyor.

O. D. Jones	£5,098	0	0
W. Thomas	4,884	0	0
W. PARRY, jun., Farrar Road, Bangor (accepted)	4,712	10	0

**LONDON.**

For laying new fire mains at the Cornwallis Road workhouse, Holloway, for the Guardians of St. Mary, Islington. Mr. WILLIAM SMITH, architect, 65 Chancery Lane.

Moorwood & Sons	£475	5	0
Shand & Mason	458	3	0
May	410	0	0
Merryweather & Sons	402	2	0
Harris	389	0	0
Harding & Son	365	6	0

Architect's estimate £720, including architect's commission, digging, cutting-away, filling-in and making-good, which is not included in above estimates.

**LONDON—continued.**

For erection of a home for female attendants at the Darenth Asylum.

Enness Bros.	£7,948	0	0
Goddard & Son	7,600	0	0
W. Reason	7,517	0	0
J. Lonsdale	7,444	0	0
S. Page & Son	7,420	0	0
J. J. Wise, jun.	7,264	0	0
Cropley Bros., Ltd.	7,149	0	0
H. Wall & Co.	7,123	0	0
J. & M. Patrick	7,115	0	0
R. L. Tonge	7,098	0	0
Scott & Branton	6,955	0	0
J. & C. Bowyer	6,888	0	0
W. LAWRENCE & SON, Waltham Cross, N. (accepted)	6,854	0	0

For works required by the Fulham Borough Council.

*Tenders recommended for acceptance.*

For extension to pipework at the electric-lighting and destructor works.

Aiton & Co.	£1,872	0	0
For supply of twenty-five large indiarubber mats.			
P. B. Cow & Co.	69	6	0

**LONDON SCHOOL BOARD.**

For special school (mentally defective), four classrooms of 20—total, 80—and enclosing, draining and tar-paving additional land, the Brecknock school.

J. Simpson & Son	£4,797	0	0
C. Dearing & Son	4,573	2	3
W. M. Dabbs	4,462	0	0
J. Grover & Son	4,392	0	0
J. Willmott & Sons	4,388	0	0
Marchant & Hirst	4,338	0	0
T. L. Green	4,289	0	0
G. S. S. Williams & Son	4,285	0	0
Patman & Fotheringham, Ltd.	4,267	0	0
F. Gough & Co.	4,223	0	0
McCormick & Sons	4,178	0	0
H. Wall & Co.	4,177	0	0
C. Cox	4,140	0	0
Treasure & Son	4,018	0	0
E. Lawrence & Sons*	3,949	0	0

\* Recommended for acceptance.

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**LONDON SCHOOL BOARD—continued.**

For fitting boys and junior mixed boys' urinals with sparge pipes, asphalted dado, &c., and providing new lavatory basins and slop sinks inside building with new waste; refitting schoolkeeper's w.c., fixing new ventilating pipe and connecting it to existing drain, fixing new sink in scullery and connecting waste to gully outside, Tooting Graveney school.

Maxwell Bros., Ltd.	£390	0	0
W. H. Lorden & Son	369	0	0
W. Johnson & Co., Ltd.	363	0	0
Rice & Son	362	0	0
E. Triggs	334	0	0
W. Hammond	320	0	0
Lathey Bros.	279	0	0
H. Loney & Son *	275	0	0

For reversing stepped flooring in Classroom E and altering position of doorway in connection with same; also providing skylight in same room and a borrowed light in wall between cloak-room and hall, Lower Chapman Street school.

T. L. Green	£183	0	0
Vigor & Co.	162	10	0
A. E. Symes	155	0	0
D. Gibb & Co.	154	0	0
Barrett & Power	152	0	0
J. T. Robey	147	10	0
G. Barker	145	0	0
F. & F. J. Wood *	129	0	0

\* Recommended for acceptance.

**MONGEWELL.**

For erection of a new school and teacher's house at Mongewell, Oxon, for the School Board of Mongewell and N. Stoke. Messrs. HOARE & WHEELER, architects. Quantities by Messrs. H. COOPER & SON, Reading.

H. Godwin	£2,172	0	0
George Cooper & Sons	1,876	0	0
H. Bowden	1,872	0	0
McCarthy E. Fitt	1,778	0	0
James Smallbone	1,772	0	0
Brasher & Son	1,751	7	7
Boxall & Son	1,749	0	0
Bosher & Son	1,587	17	8
JAMES COX, Stoke Row (accepted)	1,575	12	0

**NEWHAVEN.**

For supply of about 220 cubic yards of granite to pass through a 2-inch ring. Mr. F. J. RAYNER, surveyor.  
ROAD MAINTENANCE COMPANY, Gravesend, 11s. 9d. per cubic yard (accepted).

**NEWTON ABBOT.**

For erection of a nurses' home at the workhouse, Newton Abbot, Devon. Mr. SAMUEL SEGAR, architect.

F. A. A. Stacey	£1,419	0	0
F. J. Zealley	1,400	0	0
Parker Bros.	1,398	10	0
L. Bearne	1,395	0	0
H. Mills	1,340	0	0
G. HICKS, Newton Abbot (accepted)	1,298	0	0
W. Brenton	1,086	0	0

**PADSTOW.**

For supply of 6 $\frac{3}{4}$  miles of cast-iron pipes, 5-inch, 4-inch and 3-inch diameter; sluice valves, hydrants, stand-posts, &c.; for laying and fixing materials specified above, including trenching, and constructing a 50,000-gallon reservoir in brick and cement.

*Accepted tenders.*

J. & R. Ritchie, Middlesbrough, pipes, &c.	£1,891	8	1
W. Burt, Launceston, trenching, &c.	900	0	0
W. E. Bennett, Plymouth, reservoir.	660	0	0
J. Blakeborough & Sons, Brighouse, valves, &c.	165	6	0

**ST. ALBANS.**

For erection of a shop and sundry additions to adjoining premises, corner of Verulam Road and Spencer Street, for Mr. W. Kentish. Mr. S. D. EDMUNDS, architect and surveyor, 70 Victoria Street, St. Albans and London.

W. Goodchild & Sons	£495	0	0
W. Sharp	460	0	0
W. VAIL & Co., St. Albans (accepted)	425	0	0

For erection of a pair of villa residences, Upton Avenue, Spencer Park estate, for Mr. W. Edwards. Mr. S. D. EDMUNDS, architect and surveyor, St. Albans.

W. GOODCHILD & SONS, St. Albans (accepted) £695 0 0

For erection of a pair of villa residences, Blenheim Road, St. Albans, for Mr. J. F. Coutts. Mr. S. D. EDMUNDS, architect, St. Albans.

W. GOODCHILD & SONS, St. Albans (accepted) £1,190 0 0

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**ST. ALBANS—continued.**

For erection of a detached residence, Clarence Road, St. Albans, for Mr. G. R. Purdie. Mr. S. D. EDMUNDS, architect, St. Albans.

W. GOODCHILD & SONS, St. Albans (*accepted*). £665 0 0

For erection of a pair of villa residences with stabling, corner of Granville and Grimston Roads, for Mr. J. A. Pratt. Mr. Mr. S. D. EDMUNDS, architect, St. Albans.

G. Archer . . . . .	£1,448	0	0
Miskin & Sons . . . . .	1,445	0	0
E. Dunham . . . . .	1,394	0	0
J. Elwood . . . . .	1,277	4	6
J. Andrew . . . . .	1,250	0	0
H. J. Skelton . . . . .	1,182	4	7
Goodchild & Sons . . . . .	1,125	0	0
W. VAIL & CO, St. Albans ( <i>accepted</i> ) . . . . .	1,108	10	0

**SCOTLAND.**

For erection of (1) double cottar house to be erected at Newmill Farm, Rathen; (2) dwelling-house to be erected at Merryhillock Farm, Fraserburgh.

*Accepted tenders.**Newmill cottar houses.*

G. Corbett, New Pitsligo, mason.  
A. Gregor, Memsie, Fraserburgh, carpenter.  
J. Reid, Fraserburgh, slater.  
A. Wiseman, Fraserburgh, plasterer.

*Merryhillock dwelling-house.*

G. Corbett, mason.  
Brebner & Jenkins, Fraserburgh, carpenter.  
J. Reid, slater.  
A. Wiseman, plasterer.

For erection of a house at Stotfield, near Elgin. Messrs. A. & W. REID & WITTET, architects, Elgin.

*Accepted tenders.*

A. & R. Dunbar, carpenter . . . . .	£378	0	0
J. Young, Coleraine, Elgin, mason . . . . .	335	0	0
W. Lyon & Sons, Lossiemouth, plumber . . . . .	117	13	0
J. Wilson, Dufftown, slater . . . . .	79	15	0
C. & W. Menzies, Lossiemouth, plasterer . . . . .	76	14	0
J. Kintrea & Son, painter . . . . .	23	0	0

**SCOTLAND—continued.**

For erection of an infectious diseases hospital, boundary walls, &c., at the east end of Old Rattray, Blairgowrie. Messrs. L. & J. FALCONER, architects, Blairgowrie.

*Accepted tenders.*

J. McLeish, Blairgowrie, mason . . . . .	£1,420	0	0
T. Doig, jun., Blairgowrie, joiner . . . . .	872	10	0
R. Kidd, Blairgowrie, plumber . . . . .	760	0	0
W. Sidney, Alyth, plasterer . . . . .	230	3	0
J. McLeish, boundary walls . . . . .	223	0	0
A. R. Duncan & Son, Blairgowrie, slater . . . . .	190	10	1
P. Stewart, Alyth, painter . . . . .	83	3	1
Reck Heating Co., Copenhagen, disinfecting apparatus . . . . .	81	15	6
McDowall, Steven & Co., Glasgow, hospital stoves . . . . .	50	2	0
W. Briggs & Son, Ltd., Dundee, asphalt work . . . . .	46	4	11
A. Sinclair & Son, Alyth, grates . . . . .	34	5	0
A. Westwood & Son, Perth, window blinds . . . . .	16	5	0

**SHEFFIELD.**

For sewage works to be carried through the fields of the South Yorkshire Asylum at Middlewood and Forge Lane, Oughtibridge. Mr. G. E. BEAUMONT, engineer, Grenoside, near Sheffield.

J. E. NADIN, Western Road, Sheffield (*accepted*) . . . . . £710 15 10

**SKEGNESS.**

For erection of a factory manager's house, &c., at Skegness, Lincs. Mr. JESSE CLARE, architect, Sleaford.

Parker . . . . .	£1,667	0	0
Parker & Son . . . . .	1,325	0	0
Crawshaw . . . . .	1,280	0	0
Dunkerley & Son . . . . .	1,275	0	0
Maxey & Sons . . . . .	1,265	0	0
Clay & Berry . . . . .	1,250	0	0
Turner . . . . .	1,238	0	0
Holmes & Son . . . . .	1,180	10	0
S. F. Pattinson . . . . .	1,175	0	0
PARKER & SON, Boston ( <i>accepted</i> ) . . . . .	1,149	10	0

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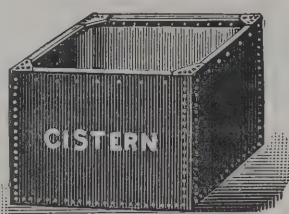
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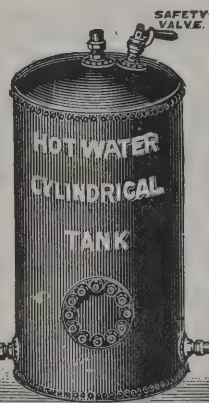
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SLINFOLD.

For erection of a cottage at Slinfold, Sussex. Mr. C. H. BURSTOW, architect, 6 West Street, Horsham.			
G. Potter	£375	0	0
Murrell Bros.	375	0	0
H. Lindfield & Son	367	0	0
Hillman & Murrell	361	9	0
Potter Bros.	350	0	0
Rowland Bros.	349	0	0
Hull & Redford	348	0	0
Reeves & Port	311	0	0
T. Ayling	300	0	0
G. MARDEN, The Haven, Billingshurst (accepted)	280	0	0

SOUTHAMPTON.

For extension of car-sheds and other buildings at the Portsmouth tramway depôt. Mr. J. A. CROWTHER, borough engineer.			
J. Nichol	£3,295	0	0
Coston & Co., Ltd.	3,263	0	0
F. Osman	3,100	0	0
H. Stevens & Co.	2,984	0	0
Jenkins & Sons, Ltd.	2,983	0	0
DYER & SONS, Southampton (accepted)	2,775	0	0

SWINDON.

For supply of direct-current electricity meters at the electricity works, Swindon.			
VENNER & Co., 6 Old Queen Street, Westminster (accepted)	£216	17	6

WALES.

For erection of the Hafod school, Swansea.			
D. W. Davies	£25,035	0	0
A. S. Morgan & Co.	24,392	0	0
G. Davies	23,801	0	0
Walters & Johns	23,498	0	0
J. & D. Jones	23,211	0	0
T. Richards	22,187	0	0
J. Williams	22,055	0	0
D. Jenkins	21,595	0	0
Lloyd Bros.	21,477	0	0
H. Billings	21,409	0	0
Bennett Bros.	21,185	0	0
J. & F. WEAVER, Manselton, Swansea (accepted)	20,560	3	0

WALES—continued.

For erection of a new mixed school at Danygraig, Risca, Mon. Mr. ERNEST N. JOHNSON, architect, Risca.			
J. Charles	£4,158	10	0
Davies Bros.	4,207	19	0
J. PRITCHARD, Pontymister (accepted)	3,905	10	0
For strengthening the wrought-iron girders and the repair of the piers, abutments, &c., of the Rhyl bridge, North Wales.			
HEENAN & FROUDE, LTD., Manchester (accepted).			
For repairs to the hospital ship, Beaumaris.			
J. ELLIS, Hiracl, Bangor (accepted)	£28	10	0
For erection of a laundry building at Llwynpia, Pontypridd. Mr. A. O. EVANS, architect, Pontypridd.			
D. R. Lewis	£1,069	0	0
J. Edwards	1,059	0	0
Lattey & Co.	989	0	0
Knox & Wells	969	0	0
E. R. Evans Bros.	927	0	0
T. W. Davies	915	0	0
For supply and delivery of Portland cement from the 1st inst. to March 31 next, for the Cardiff Corporation. Mr. W. HARPUR, borough engineer.			
J. C. Johnson & Co., Ltd.	£1	8	0

WATCHET.

For reconstruction of Watchet harbour, Somerset. Mr. W. T. DOUGLAS, engineer, 15 Victoria Street, Westminster.			
S. Saunders	£41,500	0	0
H. W. Pollard	26,900	0	0
R. H. Neal	23,628	0	0
J. & M. Patrick	22,990	0	0
S. Wood	21,991	0	0
A. Facey & Son	21,356	6	9
J. & T. Binns	21,298	17	0
J. Dickson	18,755	14	1
G. Rutter	18,750	18	0
E. H. Page	18,135	6	4
E. R. Lester	16,970	0	0
C. H. WALKER & Co., Westminster (accepted)	16,183	3	5
B. Cooke & Co.	15,619	12	9

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Houses, Glasgow,  
&c., &c.

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Star Engine Works,  
Moncur St., GLASGOW.

# HEATING



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CROWN WORKS,  
LEEDS.**



## WATFORD.

For reinstating premises in the St. Albans Road. Mr. C. P. AYRES, architect, Watford. Quantities by architect.

R. L. Tonge . . . . .	£2,597	0	0
Swain . . . . .	2,496	0	0
Judge . . . . .	2,354	0	0
H. Brown . . . . .	2,333	0	0
C. Eames . . . . .	2,297	0	0
F. Dupont & Co. . . . .	2,296	0	0
J. & J. Waterman . . . . .	2,274	0	0
T. Turner & Co. . . . .	2,256	0	0
Clark Bros. . . . .	2,211	0	0
Murrey . . . . .	2,197	0	0
Webster & Cannon . . . . .	2,190	0	0
C. Brightman . . . . .	2,168	0	0
Watkins . . . . .	2,159	0	0
Wiggs . . . . .	2,154	0	0
CLIFFORD & GOUGH, Watford (accepted) . . . . .	2,114	0	0

For street works in Brighton Road, Whippendell Road and Kingsfield Road. Mr. D. WATERHOUSE, surveyor.

*Brighton Road.*

T. Free & Sons . . . . .	£693	0	0
P. Simmons . . . . .	682	0	0
H. Brown . . . . .	570	0	0
Bracey & Clark . . . . .	477	0	0
H. B. Watkins . . . . .	475	0	0

*Whippendell Road.*

P. Simmons . . . . .	2,001	0	0
T. Free & Sons . . . . .	1,875	0	0
Bracey & Clark . . . . .	1,579	0	0
H. B. Watkins . . . . .	1,387	0	0
H. Brown . . . . .	1,385	0	0

*Kingsfield Road.*

P. Simmons . . . . .	2,138	0	0
T. Free & Sons . . . . .	2,085	0	0
Bracey & Clark . . . . .	1,733	0	0
H. B. Watkins . . . . .	1,549	0	0
H. Brown . . . . .	1,490	0	0

## .WATFORD—continued.

For pulling-down and rebuilding 161 and 163 High Street, and 4 Water Lane. Mr. C. P. AYRES, architect, Watford. Quantities by the architect.

J. & J. Waterman . . . . .	£2,133	0	0
Tyler & White . . . . .	2,000	0	0
C. Eames . . . . .	1,990	0	0
Clifford & Gough . . . . .	1,989	0	0
Clark Bros. . . . .	1,981	0	0
Webster & Cannon . . . . .	1,975	0	0
C. Brightman . . . . .	1,948	0	0
Watkins . . . . .	1,947	0	0
Judge . . . . .	1,928	0	0
Wiggs . . . . .	1,923	0	0
H. Brown . . . . .	1,875	0	0
Swain . . . . .	1,834	15	10
F. DUPONT & Co., 3 Darby Road, Watford (accepted) . . . . .	1,768	0	0

## WEALDSTONE.

For street works in Hinde's Road. Mr. F. HILL-PARR, surveyor.

Lawrence & Thacker . . . . .	£2,200	10	10
T. Free & Sons . . . . .	2,059	8	5
G. Wilson . . . . .	2,070	0	0
H. Brown . . . . .	1,949	0	0
T. Adams . . . . .	1,910	15	9
H. M. HOLLINGSWORTH, Wealdstone (accepted) . . . . .	1,880	1	5

## WEST NORWOOD.

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S. E. Moss . . . . .	£785	0	0
H. R. Brown . . . . .	617	10	0
R. Harding & Sons . . . . .	585	0	0
C. Ansell . . . . .	555	0	0
H. Hussey . . . . .	536	10	3
J. Parsons . . . . .	519	0	0
S. Lintern . . . . .	504	0	0
Battley, Sons & Holness . . . . .	482	0	0
H. Bragg & Sons . . . . .	479	0	0
London & County Builders, Ltd. . . . .	470	18	8
I. Pearce . . . . .	450	0	0
H. KENT, 17 Albion Road, Lewisham (accepted) . . . . .	399	0	0

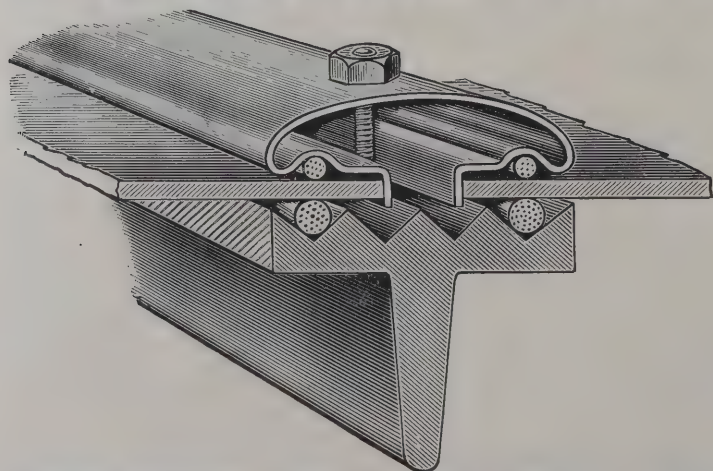
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WEST HARTLEPOOL.

For painting interior of the Lynnfield and Church Square Board schools during the Christmas holidays.

Accepted tenders.

Lynnfield school.

J. T. Burdon . . . . . £31 0 0

Church Square school.

J. Branson & Son . . . . . 21 15 0

WEST HAM.

For street works in Glasgow Road, Tweedmouth Road, Stirling Road, Dundee Road, Edinburgh Road and Southern Road. Mr. JOHN G. MORLEY, borough engineer.

P. W. Symmons . . . . . £4,998 4 4

J. Jackson . . . . . 3,561 5 10

T. Adams . . . . . 3,538 16 8

Lawrence & Thacker . . . . . 3,474 14 2

W. Griffiths & Co., Ltd. . . . . 3,442 13 5

D. T. Jackson . . . . . 3,325 11 2

W. Manders . . . . . 2,947 14 3

G. J. Anderson . . . . . 2,773 19 9

PARSONS & PARSONS, Ilford Wharf, Ilford

(accepted) . . . . . 2,610 2 1

WHITEHAVEN.

For erection and construction of latrines, playshed, cloakroom, concreting or asphaltting playground, draining, &c., at Trinity schools. Mr. J. S. MOFFAT, architect, 53 Church Street, Whitehaven.

A. & T. HENDERSON, Whitehaven (accepted).

WILTON.

For supply of a steam road-roller with scarifier. Mr. W. W. H. MUSSELWHITE, borough surveyor.

T. BARNES, Southwick, near Trowbridge, £1 5s. 9d. per day (accepted).

WOODFORD.

For sewerage works at Back Hill, Woodford Bridge. Mr. WILLIAM FARRINGTON, surveyor.

W. & C. FRENCH, Buckhurst Hill (accepted) . £133 15 6

Note—Four other tenders.

WOODFORD.

For erection of Ray Lodge and Woodford Bridge schools, Snakes Lane. Mr. EDWARD TIDMAN, architect, Connaught Mansions, Westminster. Quantities by Messrs. J. S. LEE & SONS, 35 Craven Street, W.C.

Townsend & Coles . . . . . £26,000 0 0

Oak Building Co. . . . . 20,296 0 0

W. H. T. Kelland . . . . . 19,900 0 0

Stevens, Bastow & Co. . . . . 19,498 0 0

J. Appleby & Son . . . . . 19,200 0 0

G. Sharp . . . . . 19,012 0 0

Sands, Palmer & Co. . . . . 19,000 0 0

McKay & Co. . . . . 18,910 0 0

A. W. Robins . . . . . 18,830 0 0

A. E. Symes . . . . . 18,798 0 0

F. Willmott . . . . . 18,745 0 0

Barrett & Power . . . . . 18,500 0 0

R. L. Tonge . . . . . 17,997 0 0

Ernest West . . . . . 17,973 0 0

P. Banyard . . . . . 17,845 15 0

H. J. Carter . . . . . 17,682 0 0

T. Almond & Son . . . . . 17,577 0 0

T. Coxhead . . . . . 17,440 0 0

Myall & Upson . . . . . 16,456 0 0

H. WELLS & SONS, Buckhurst Hill\* . . . . . 16,345 0 0

\* Accepted with modifications.

Received too late for Classification.

LEEDS.

For construction of an aqueduct tunnel, about 2½ miles in length, between Kettlesing Bottom, in the township of Felliscliffe, and the Swinsty reservoir, in the township of Clifton-with-Norwood, and for a pipe line and other works in connection therewith.

J. E. KAYE, Crossland Moor (accepted) . . £73,741 0 0

CONTRACTS OPEN.

BRIGHTON.—Dec. 23.—For the construction of the permanent way of the tram roads in London Road, St. Peter's Place, York Place, Pavilion Parade, and Old Steine, &c., including the bonding and all contingent works, and paving with wood the whole of the area of such roads, including the tramway tracks. Mr. Francis J. C. May, surveyor, Town Hall, Brighton.

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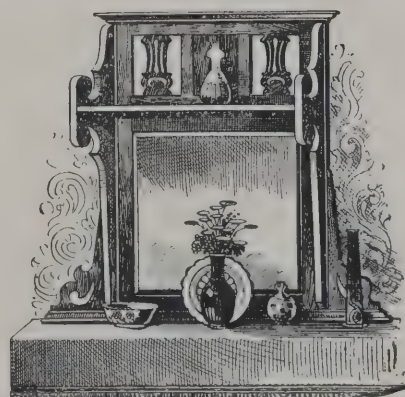
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DEWSBURY.—Dec. 11.—For supply and delivery of one 200-kilowatt and one 300-kilowatt continuous-current steam dynamo, with Allen's, Belliss, Browett-Lindley or Willans engines. Mr. R. H. Campion, borough electrical engineer, Town Hall, Dewsbury.

WALES.—For erection of a vicarage at Ystradfellte. Mr. Glendinning Moxham, architect, 39 Castle Street, Swansea.

### TRADE NOTES.

THE Rochford Union infirmary is being warmed and ventilated by means of Shorland's patent Manchester stoves with descending smoke flues and patent Manchester grates.

MESSRS. HANDYSIDE & CO., LTD., of Derby, makers of steel bridges, roofs, buildings and structures, have secured the contract for the new drawbridge over the North Dock lock at Swansea for the Swansea Harbour Board.

THE Economic Fencing Company, of Billiter House, E.C., will show at the Cattle Show, Stand No. 34, in King Edward's Hall, Agricultural Hall, their latest patterns of patent machine-made fencing. This company are inaugurating new works on the river side to meet the increased demand for quick supply.

THE St. Pancras Iron Work Company, Limited, have recently completed the fitting up with their patent stable fittings of an extensive range of stabling at Woburn Abbey, Beds. This is the second order of this nature with which they have been favoured by the Duke of Bedford.

MESSRS. HAYWARD-TYLER & CO., of 90 and 92 Whitecross Street, E.C., have prepared an artistically got-up catalogue of the electrically driven and other treble-barrel pumps which they manufacture in numerous dimensions and capacities suitable for all imaginable purposes to which pumps can be applied, the delivery power ranging from 125 to 590,500 gallons per hour.

It is always a source of satisfaction to playgoers and others to know that the arrangements for their safety are studied by the management. In this connection the London County Council has no doubt effected many reforms, including the provision of fireproof curtains between the stage and auditorium. Quite a number of theatres and amusement halls are just now being fitted with such curtains by Merryweathers, who make a specialty of such work, in addition to the fire protective apparatus with which they are usually associated. The following, we learn, are amongst some of the theatres now installing the curtain:—Sir Charles Wyndham's new theatre, Haymarket,

Old Gaiety, New Gaiety, Garrick, Pavilion (Mile End), Royal (Holborn), South London and others.

MESSRS. MATHER & PLATT, LTD., engineers, of Salford Iron Works, Manchester, inform us that they have recently received instructions to carry out the sewage purification works at the following hospitals amongst other institutions of a similar kind:—Sanatorium for Consumptives, Delamere, Cheshire; Epileptic Colony, near Alderley Edge, Cheshire; County Asylum, Winwick, Lancashire; Smallpox Hospital, Warrington. They have also received instructions to supply eight of their patent revolving spreaders for the Dorchester purification works. Amongst the spreaders which they are now constructing is one of 120 feet diameter for the Birmingham Tame and Rea Drainage Board, and one of 200 feet diameter for Chichester. In connection with these revolving spreaders their patent automatic and distributing discharge valves will be used.

MESSRS. ALLEN, JONES & CO., of Hatherley Works, Gloucester, have on view at their London showrooms, 34 Worship Street, E.C., a large variety of their specialties, which comprise Jones's patent Hatherley lattesteps which, as will no doubt be gathered from the name, are folding steps or ladders made on the lattice or slat principle, by means of which the maximum of strength and rigidity is combined with the minimum of weight. Messrs. Allen, Jones & Co. apply the principle embodied in the manufacture of these steps to folding chairs, tables, &c., of which they show some pleasing patterns, a useful combination of shop seat and steps being worthy of note in this department. Another notable piece of furniture is a collapsible tennis-table, which by means of their ingenious compensating joint is prevented from shrinking or warping. Owing to the joints being glued as well as reinforced on the underside, these half-inch tops are as solid as an inch top, with the advantage of being, of course, half the weight. The underframe has a continuous top rail, which undoubtedly will be found superior to trestles or anything else in the market for tennis tables or other occasional requirements. Among other specialties which we noted were bed-tables, bicycle stands in variety and other articles of a like useful nature.

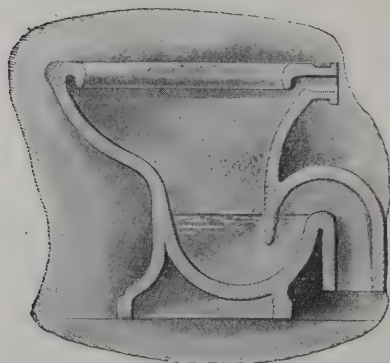
MR. W. MACKAY, known as the Lumber King of Canada, died at Ottawa on December 1. Mr. MacKay went to Canada when a boy, from Ireland, without a shilling in his pocket, and his first position was that of a mill hand in the North-West. The fortune he has left exceeds three million dollars.

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STATIONERS' HALL, LUDGATE HILL: THE BOARD-ROOM.

## VARIETIES.

MR. ERNEST MAWDESLEY, town clerk of Croydon, died yesterday.

Two new Board schools have been opened at Wolverhampton—one in Springfields, for children in Standards 3 to 6, and one in Bingley Street, Lea Road, for children in Standards 1 to 4. Each school will accommodate over 200 children.

At a meeting of the Llangollen Town Council the dangerous state of the town hall was again discussed, and the chairman announced that negotiations were progressing with the Local Government Board, who were retaining the Council's plans to secure the building. Ultimately the Council resolved to appeal to the authorities to hurry on the Government official inquiry.

A NEW Board school was opened at Kinfauns, N.B., on the 1st inst. It has been built for 100 pupils, the accommodation of the old school having proved insufficient. It is situated to the east of the former school, and the front extends about fifty feet. There are two classrooms—one an infant department—besides cloakrooms for boys and girls. In the playground are shelter sheds. Mr. H. J. Bell, C.E., Perth, is the architect.

THE Commissioners of Northern Lighthouses on Monday took over the historic Bass Rock, and in the evening their magnificent new lighthouse there was lighted up for the first time. The lantern is a six-flash light of 39,000-candle illuminating power. The adjoining keepers' houses have been provisioned for six months. During the building of the lighthouse opportunity was taken to restore the crumbling masonry on the east bastion, against which the waves dash ceaselessly, and in stormy weather to a great height.

THE new public baths, erected at Elland by the District Council at a cost of about 6,000*l.*, were opened on the 22nd ult. by Councillor Eastwood, chairman of the Council, who said that the new baths were the largest project the District Council had yet undertaken, with the exception of the sewage works. The latter cost them between 14,000*l.* and 15,000*l.*, and they had proved a great factor in lowering the death-rate and improving the sanitary condition of the district. The Council were now engaged in another large work, namely, the installation of electric light in conjunction with a refuse destructor.

THE building which has been completed for Lodge Torphichen, Kilwinning No. 13, at Bathgate, N.B., has just been consecrated. The hall was formally opened by Robert Kirk, M.D., R.W.M. of Lodge Torphichen, Kilwinning. The consecration ceremony was performed by Thomas Hope of Bridgecastle, R.W.P.G.M., and the Provincial Grand Lodge of Linlithgowshire. A dinner took place in the evening in the Corn Exchange, Dr. Kirk presiding. The building is situated in Jarvey Street, and is two storeys in height, the shop fronts and hall fittings being of oak. The architect is Peter L. Henderson, J.P.M. of Lodge Cannongate No. 1.

MR. E. W. MOUNTFORD, the assessor appointed to adjudicate upon the designs sent in for the new central library in Deanery Road, Bristol, has made his award. Altogether sixty-one designs were received. Mr. Mountford has awarded the first prize to Mr. H. Percy Adams, of Russell Square, and this is the design from which the new library will be erected. The next in order of merit, carrying a premium of 100*l.*, is the design of Messrs. Nott & Collins, of Chelsea, and the third, for which a premium of 50*l.* is given, is that of Mr. A. T. Butler, of Cradley Heath.

THE foundation-stone was laid on Monday of new voluntary schools in course of erection at Rubery, Worcestershire. In 1808 the managers of St. Chad's Church received permission to open an infants' school in the vestry of the church on condition that a permanent school building was built within five years. Twelve months ago an intimation was received from the Education Department that that body would call upon the Bromsgrove School Board to erect a school unless plans for a new building were forwarded. As a consequence of this some 1,150*l.* has been subscribed towards the erection of a new school, and Christ Church College, Oxford, gave a site containing about half an acre, situated in the New Road. Here a

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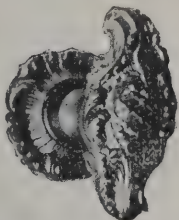
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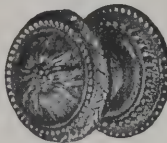
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new school has been begun, the cost of which is estimated to be about 1,550*l*. The new structure will provide accommodation for about 200 children.

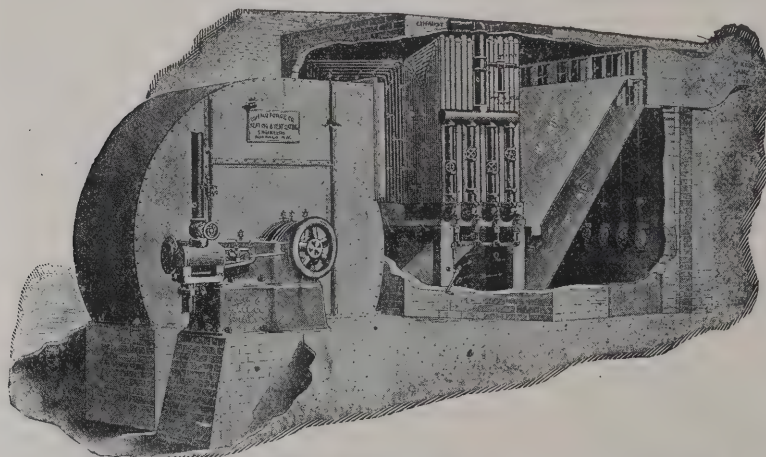
THE Eton Rural District Council have been asked to approve of the action of their surveyor in connection with a dispute between the Council and a water company. The Bucks County Council had opposed the Rickmansworth Water Company obtaining certain parliamentary powers unless assurances were given that the company would not take more water out of Bucks than was brought in. Nevertheless, without obtaining those powers, the company laid 70 yards of piping in the Eton Council's district, whereupon the surveyor borrowed a traction engine from an obliging local landowner, hitched chains on to the pipes from the engine, and pulled them out of the ground. The Eton Council approved of this action, and commended the surveyor for his promptitude and energy.

WITH a view to the erection of a common hospital, the draft of the proposed provisional order for forming a united district under the provisions of the Public Health Act, 1875, has been prepared by Mr. Horatio Brevitt, the town clerk of Wolverhampton. The districts which the proposed order will affect are Amblecote, Bilston, Caseley, Darlaston, Heath Town, Rowley Regis, Short Heath, Tettenhall, Tipton, Wednesfield, Kingswinford, Smethwick and Wolverhampton. The scheme differs from that formulated by the county medical officer of health, inasmuch as it leaves out of its scope Brierley Hill, Handsworth, Perry Barr, Quarry Bank, Wednesbury, Seisdon, Walsall, West Bromwich and Dudley. The cost of erecting a suitable hospital has been estimated at 9,000*l*, and authorities within the area representing a population of 337,394 are in favour of the scheme. The governing body would consist of three *ex officio* and twenty-four elective representatives. The expense of erecting the hospital will be paid *pro rata* by the sanitary authorities named.

THE annual meeting of the Society of Antiquaries of Scotland was held on Monday, the Right Hon. Sir Herbert Maxwell, president, in the chair. The following is the list of the office-bearers and council for the ensuing year:—President, the Right Hon. Sir Herbert Maxwell; vice-presidents, David Murray, the Earl of Southesk and Robert Munro; secretaries, D. Christison and the Hon. John Abercromby; foreign secretaries, T. G. Law and William K. Dickson; treasurer, John Notman; curators of the museum, Professor Duns and Alexander J. S. Brook; curator of coins, George Macdonald;

librarian, James Curle, jun. Councillors—Sir George Reid and Sir Arthur Mitchell, representing the Board of Manufactures; Sir Kenneth Mackenzie, representing the Treasury; Colonel M'Hardy, James Macdonald, the Hon. Hew H. Dalrymple, Robert Bruce Armstrong, Thomas Ross, Dr. T. H. Bryce, William Garson, John M. Howden, and Professor P. Hume Brown. Dr. Christison, secretary, gave a report of the work of the Society during the past session, referring specially to the excavation of the fort on the Roman wall at Castlecary, a detailed account of which will be submitted to the Society in the course of the ensuing session. The number of antiquities added to the museum during the year had been 374 by donation and 546 by purchase, and 103 books had been added to the library by donation and 68 by purchase.

AT a joint meeting of the architectural section and the sanitary and social economy section of the Royal Philosophical Society of Glasgow, held on Monday evening at 207 Bath Street (Mr. Chalmers, president of the architectural section, presiding), Mr. A. B. MacDonald, the city engineer, delivered a lecture on "The sewage disposal of Glasgow and adjacent burghs." He described the main drainage scheme of the city at present in course of construction, stating at the outset that, with the sole exception of a London scheme, it was the greatest of the kind that had ever been embarked upon. It was divided into three sections—one at Dalmarnock, on the northern bank of the river, another at Dalmuir, and a third at Braehead, on the southern bank of the river. The Dalmarnock section comprised about 11 square miles, and the Dalmuir and Braehead sections each 14 square miles. The daily volume of dry-weather sewage treated at Dalmarnock was about sixteen million gallons, which would ultimately be increased to twenty million gallons. That treated at Dalmuir would be forty-nine million gallons, and that at Braehead forty-eight million gallons. For the collection and disposal of these ninety-seven millions of gallons of sewage there would be constructed thirty miles of sewers varying from 2 feet 6 inches to 10 feet in diameter, the separate capacities of which had been calculated to discharge 214 millions of gallons of water. During the course of next year it was hoped that the work on the northern bank of the river would be so far advanced as to permit of a greater quantity of sewage from the western area being purified, and a corresponding improvement on the condition of the river effected. The works on the southern bank would require a longer time for their completion. A discussion followed the lecture, and at the close Mr. MacDonald was awarded a vote of thanks.



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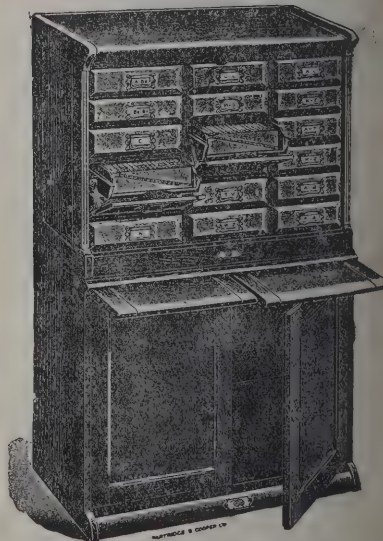
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**ELECTRIC NOTES.**

AT Tuesday's meeting of the Llangollen Town Council the chairman reported the formation of an electric lighting and power company to carry into effect the project of installing electric light into Llangollen.

A MEETING of the Redditch Urban District Council was held on the 2nd inst. Mr. Gross called attention to the unsatisfactory nature of the electric light in the town. It had been so bad of late that a number of large consumers were threatening to have the supply cut off. The whole thing, he said, was so very unsatisfactory that it was his intention to give notice at the next meeting to propose that the Council offer the whole electric lighting system, "lock, stock and barrel," to Mr. Pierpont Morgan for 30,000*l*.

MR. R. H. BICKNELL, C.E., inspector of the Local Government Board, held an inquiry at the Town Hall, Rhyl, on Wednesday, respecting an application by the Rhyl Urban District Council for sanction to borrow 9,567*l*. for purposes of electric lighting, and 2,233*l*. for refuse destructor purposes. Mr. Arthur Rowlands (town clerk) conducted the application on behalf of the Council. Mr. Rowlands said the scheme had by force of circumstances grown much larger than they first anticipated. The loans originally taken up in connection with the undertaking amounted to 14,640*l*., and what they had now applied for was an excess loan upon that amount which had been overspent. The Inspector said it was an absolutely improper thing for the Council when they found they had not enough money to go on with the scheme. They should have lost no time in making further application to the Local Government Board before spending anything beyond the original estimate. Details were then gone into at some length, the Inspector remarking at the outset that he wished to make it perfectly clear that these excess loans were very irregular and very unnecessary. He intended making the matter very clear to the Local Government Board, and if any further expenditure of this kind occurred in Rhyl it would be very doubtful if they would get any further assistance from the Board. The inquiry then proceeded, but there being an insufficiency of figures before the Inspector, the result was that they failed to work out at the amounts indicated. The Council retired to consider what course should be taken, and eventually it was decided to adjourn the inquiry, the Inspector tentatively fixing upon January 6, 1903, as the date for the resumed hearing of the application.

AT a meeting of the Inverness Town Council communications were submitted from the Board of Trade and the Caledonian Canal Commissioners regarding a water-power scheme for the electric lighting of the burgh. A provisional order was obtained over two years ago for a steam-power scheme, which, though the preliminary expenses amounted to about 4,800*l*., fell through, and the old idea thereupon revived of drawing power from the canal, where a fall of 30 feet is available. It seems that the Canal Commissioners, owing to the sitting of Parliament and other State affairs, cannot meet till February to consider the application of the Town Council for water rights, while the Board of Trade has only postponed its judgment as to whether the provisional order can be renewed to the end of December. In the meantime several applications have been made by private companies for the necessary Parliamentary sanction to supply the light both for public and private purposes. In the circumstances the Council resolved to again communicate with the Board of Trade through their Parliamentary agents, and also to accept the offer made on behalf of the Caledonian Canal Commissioners to the effect that, provided water rights are granted, the supply might cease when the flow reaches a minimum of 18 feet 3 inches at Dochgarroch Lock.

**BUILDING AND BUILDERS.**

AT a meeting of the Crewe Town Council on Wednesday, the mayor (Mr. J. H. Moore) presiding, it was decided to accept the tender of Messrs. John Garner & Son to erect a diphtheria ward attached to the isolation hospital for 2,296*l*.

THE foundation-stone of a new Independent Methodist church at High Park, Southport, was laid on the 29th ult. The new building, which is situated in Old Park Lane, and will be built in a simple Norman style of architecture at a cost of about 1,400*l*., will take the place of a smaller structure facing High Park Road, which was built twenty-two years ago.

MESSRS. KERR & WATSON, architects, Johnstone, N.B., have prepared plans, which have been accepted, for the erection of the new Conservative Club buildings, ground for which has been secured in Rankin Street, Johnstone. Provision is made for a good hall on the ground floor to accommodate about 300 people. In the upper flat there will be a spacious billiard-room with four tables, a recreation-room, a reading-room and other rooms for the carrying on the work of the association, besides a janitor's house and other auxiliaries.

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THE opening lecture of the series in connection with the Building Trades' Exchange of the City and District of Edinburgh, Limited, was delivered on the evening of the 27th ult. in the Exchange Rooms, 26 George Street, Edinburgh, by Professor Stanfield, M.I.C.E., F.R.S.E., Heriot-Watt College. There was a good attendance. Mr. W. Graham-Yooll (president) occupied the chair. Professor Stanfield, the subject of whose address was "Some Notes in Connection with Materials used in Building Construction," dealt first with the manufacture of materials used in building and engineering construction, then with their physical properties, and giving the results of special tests of the strength of girders and beams. He also pointed out cases of the ignorant treatment of metal after leaving the manufacturer's hands. At the close of his lecture Professor Stanfield was heartily thanked.

A SPECIAL meeting of the Stourbridge Urban Council was held on Monday evening, with reference to an important street improvement and to the scheme for a combined free library and technical institute. Mr. Isaac Nash presided. It was stated in regard to the latter question that the consulting committee thought it desirable they should arrange a conference with an equal number of the technical board to discuss their mode of procedure. The Highway and Consulting Joint Committees reported on the question of the suggested purchase of properties belonging to the North Worcestershire Breweries, Limited, which front Coventry Street and Duke Street, for the purposes of street widening and improvement, and recommended that the purchase from the brewery company should be effected on the terms provisionally agreed. There was a long discussion in committee, and on resuming the report was adopted; and a resolution was passed asking the joint-committee to ascertain the entire cost of widening Duke Street and Mill Street, and uniting them by a new street, and to report at the earliest possible moment.

THE Worcester City Council was engaged on Tuesday upon the question of the disposal of the sewage, the water and sewage committee recommending that tenders be obtained for the construction of the first section of the works, including the tunnel, &c., under the river, required for conveying the sewage to Bromwich. The Local Government Board sanctioned loans of 48,000*l*. and 4,000*l*. for carrying out the scheme in January 1901. An amendment was proposed, and supported by recently-elected members of the Council, postponing the matter

for a month owing to their lack of knowledge of the scheme. The town clerk (Mr. S. Southall) reminded the Council that the mandamus obtained against them was still in force requiring them to carry out the scheme. Mr. Charge said that when the city boundary was extended in 1885 they gave an undertaking to carry out a scheme of sewage-disposal to stop the pollution of the Severn within three years. After seventeen years they were in precisely the same position as they were in then. Upon a division the amendment was defeated, and the resolution carried with only two dissentients.

At the Railway Hotel, Ainsdale, Colonel A. J. Hepper, D.S.O., R.E., conducted an inquiry into an application of the West Lancashire Rural District Council for sanction to borrow 6,500*l*. for purposes of sewerage and sewage disposal for the township of Ainsdale, including the execution of works in the township of Halsall. Mr. Dickinson, clerk of the West Lancashire R.D.C., stated that for many years Ainsdale had suffered from want of a proper sewage system, and the present cesspool system was very unsatisfactory. They had persuaded the Marquis de Casteja to let them have on lease four statute acres of land just over the boundary of Ainsdale and abutting on Fine Jane Brook. At Crossens the water was pumped into the estuary of the Ribble. The Scarisbrick trustees would keep the water pumped, and they had obtained an easement for 30 years at 20*l*. per year. The rent for the four acres of land was only 10*l*. per year. The sewage would first go into a tank and pass on to filter beds supplied with Stoddart's patent continuous sewage filter. The cost would work out at about a shilling rate spread over 30 years. Further evidence having been given, Mr. J. E. Jarratt (town clerk of Southport) said Southport was very considerably affected by the scheme, and he wanted a guarantee that the effluent going into Fine Jane Brook would not be injurious and would come up to the standard required by the Ribble joint committee. The Inspector made a note of Mr. Jarratt's observations and closed the inquiry.

THE Town Council of Aberdeen are, we learn, on the eve of commencing a noteworthy piece of engineering, whereby the main drainage of the whole of the city is to be carried underneath the bed of the river Dee on its way to the sea. Hitherto the sewage has been discharged into the harbour, but under the new scheme, which is to cost 170,000*l*., it will be thrown into the ocean near Girdleness, a little to the south of Aberdeen. The sewage will be conveyed underneath the bed of the river by an inverted syphon, operated by gravitation; but the

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carrying out of the work has been complicated by the proposals of the Harbour Commissioners to convert the river bed above the site of this syphon into a dock. At present the Commissioners are engaged putting down sections of quay wall on each side of the river through which the syphon will be carried, this forming one of the most difficult operations in this class of engineering. The syphon tunnel, which is of cast-iron, built in sections, will be constructed in the same way as the most recent of the London underground railways, viz. by means of a shield and compressed air. The top of the tunnel will be situated at a depth of 41 feet below high-water mark, to enable the river to be dredged above it for the passage of shipping. The burgh surveyor's department, under Mr. Dyack, C.E., has charge of the laying of the syphon, and the operations to be undertaken by the Harbour Commissioners in connection with this important scheme are being executed under the superintendence of Mr. R. Gordon Nicol, C.E., their engineer.

### COMPUTATION OF THE STABILITY OF HIGH CHIMNEYS.

THE Prussian Minister of Public Works has acted on a recommendation of the Prussian Building Academy and has issued a set of regulations governing the design of high chimneys. As reported by the *Deutsche Bauzeitung*, these regulations are essentially as follows:—

The regulations generally prescribe an assumed wind pressure of about 26 lbs. per square foot on a plane perpendicular to the direction of the wind. Any possible suction on the leeward side is assumed to be included in this pressure. The wind area of the chimney is taken to be its vertical section, and if the chimney is polygonal its greatest diametral section is to be used. The point of application of the resultant of the wind pressure is to be assumed to coincide with the centre of gravity of the section, which is equivalent to assuming a uniform distribution of the wind pressure over the full height of the chimney. For circular chimneys the total wind pressure area is to be reduced to two-thirds, and for octagonal chimneys to 71 of the value for rectangular chimneys.

To determine the greatest pressure at the edges the wind should be assumed to act in a diagonal direction. The specifications allow the theoretical opening of the joints to the centre of gravity of the section, thus neglecting the tensile stresses. The compressive stresses should be determined

for wind pressures of 26 and 31 lbs. per square foot. The weight of the material per unit of volume should be that of the actual material used. The allowable unit stresses were fixed as follows:—For common brickwork laid in lime mortar (1:3), 100 lbs. per square inch; for hard burnt bricks, having a compressive strength of at least 3,160 lbs. per square inch, laid in cement-lime mortar (1 cement, 2 lime, 6 to 8 sand), 171 to 214 lbs. per square inch. For the stronger stones and mortar richer in cement, higher stresses are allowable, but a factor of safety of 10 must always be provided for, and in no case should the greatest pressure exceed 316 lbs. per square inch for a wind pressure of 26 lbs. per square foot. If higher unit stresses be deemed allowable, they should be justified by tests on blocks of masonry. The allowable compressive stress on the foundation is, for unrammed concrete, 85 to 114, and for rammed concrete 142 to 214 lbs. per square foot. The allowable bearing pressure on the soil for the assumption of 26 to 31 lbs. per square foot wind pressure is, as a rule, 61 lbs. and, exceptionally, 82 lbs. per square inch, equal respectively to very nearly 4½ and 6 tons per square foot.

### ROAD-MAKING IN SOUTH AFRICA.

BY AN EX-PUBLIC WORKS DEPARTMENT MAN.

THE Cape Public Works Department is perhaps more comprehensive in the branches with which it deals than most other colonial works offices. From building gaols to making bridges or repairing roads, all is dealt with in the small office in Grave Street, Cape Town. The matter of keeping the roads (up-country) in decent order is a serious one. When the "rains" come on the torrents that pour down the highways from the hills sweep the bed of the road before them. Then the next waggoner who comes along and gets "stuck" sends a report to the P.W.D. Office. The Department has its "road parties" scattered all over the length and breadth of Kaffirland. These road parties consist of one white man and a gang of from forty to sixty Kaffirs. The white man is paid at the rate of 10*l.* a month; the natives receive from 10*s.* to 12*s.* 6*d.* a month and their rations of mealies. The life is a very monotonous one, and no new-comer to the country could endure it; but the men who hold these positions are invariably men with years of colonial experience, and the dulness of their surroundings does

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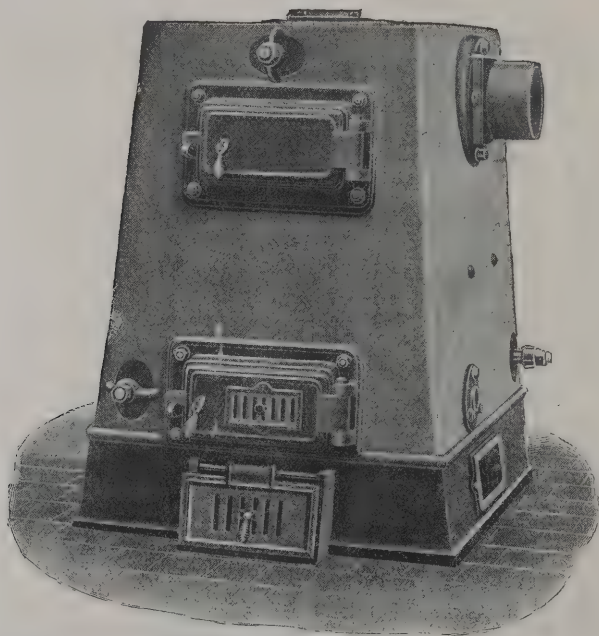


not affect them. It is reckoned that, taking the seasons round, one road party will be fully occupied in keeping fifteen miles of road in order. New roads are constantly being made in the Transkei. Transport riders start them (for transport riding is still carried on here—the railway is a thing of the future) by taking short cuts. This soon leaves the wheel-marks. Then somebody writes a letter to the nearest newspaper, "Why is not a road made in such and such a direction?" and before long a few parties will be despatched and the road started. The winters in this part of the colony are very severe, more so in fact than might be believed. This adds to the road party man's discomfort, and also to the danger he is called on to face continually in the use of dynamite. The manner in which a group of "boys" will seize a case of this explosive and dump it into a Scotch cart preparatory to moving camp would give a nervous person nightmare for a considerable period, but the old saying that "Where there is no fear there is no danger" seems to hold particularly good in the case of the natives, and few accidents ever occur. The road party man, after a time, looks on every man who travels on wheels as his natural enemy. This feeling is more intensified in the case of the post-cart driver than anyone else, because a complaint from the postal department is considered more serious than one from an ordinary civilian, and the post-cart driver who receives, may be, £14 a month, and is a power in his own district, takes full advantage of this state of affairs—at least so all road party men declare, and, speaking personally, I think they are right.

### AUCTIONEERS' INSTITUTE.

A GENERAL meeting of the members of the Hants, Wilts and Dorset Branch of the Auctioneers' Institute was held at Eastleigh on the 25th ult. There was a fairly large attendance. Amongst those present were Mr. A. A. Burnett (Southampton), chairman of the Branch, Mr. W. Burrough Hill (Southampton), Mr. W. Harris (Winchester), Mr. E. A. Scammell (Eastleigh), Mr. W. E. Moorey (Christchurch), Mr. A. Wyatt (Fareham), and Mr. A. Godwin Pratt (Boscombe), hon. secretary. The parent Institute was represented by Mr. W. Bennett Rogers (past president), and Mr. Charles Harris, the general secretary (London). After luncheon at the Junction Hotel the hon. secretary read the report of the committee, which showed that the branch now numbered over forty members, and was in a

thriving condition, both as regards numbers and finances. The applications which had been sent down from the Council had been carefully considered, and most of the candidates had been recommended for election. On the motion of the Chairman the report was adopted, and a vote of thanks was given to the committee. Mr. A. A. Burnett read an interesting paper upon "Professional Practice," during which he said he trusted the day of the "furniture dealer and auctioneer and valuer" was rapidly coming to an end, and that they looked to the members to bring in professional men only to the Institute. He thought the custom of placing a number of agents' boards upon a property which was for sale or to let caused that property to assume a derelict appearance, which could not be to the advantage either of the owner or the agents. He suggested that where it was desired to place properties in the hands of all the agents in any particular place, one board only should be placed upon the property stating that "particulars may be obtained of all the principal agents." He also trusted that the day would soon be past for looking at the obituary column as a source of income in the way of touting for valuations for probate. With regard to valuation fees, he thought any attempt on the part of the Institute to fix a scale for the whole of the country would be dangerous and impracticable. On the other hand, he thought that each town or district might have some uniformity of scale. He deprecated, in the case of valuations for mortgage, the pernicious practice of accepting one fee if the mortgage was carried through, and another if it was not, the work and skill required being equal in both cases. No premium should be offered for a high valuation. Again, if they were called upon to value property of which they did not consider they had sufficient knowledge they should, in the interests of their clients and of their professional reputation, seek the assistance of experts. Neither should they be persuaded to divide commissions with members of other professions; the principle of introducing business should be "give and take." He thought practices of that kind could be put a stop to if the members of the Institute would work together with that object. He had formed these opinions after a membership of the Auctioneers' Institute for fourteen years. The points raised in the paper were discussed by several of the members, and a vote of thanks to Mr. Burnett was carried with acclamation. The committee then proceeded to transact the general business of the branch, during which several applicants for membership were recommended for election.



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**STANDARD PORTLAND CEMENT TESTS.\***

ALL experiments shall be carried on as nearly as possible at a uniform temperature of 65 degs. Fahr., except when tests are being made for the purpose of ascertaining the comparative strength of cements required for winter use.

**1. Proportions.**

All proportions shall be determined by weight.

**2. Fineness of Cement.**

For the present a maximum residue of 10 per cent. on the 100 by 100 mesh sieve shall be the test for fineness, and the whole of the cement shall pass a 50 by 50 mesh sieve. The gauge (Stubb's) of the wire shall be No. 35 for the 50 by 50 sieve, and No. 40 for the 100 by 100 sieve. A mechanical sifter, working automatically by jig motion, and thus eliminating personal error, is recommended.

In the case both of hand mixing and sifting with the mechanical mixer the process shall occupy a definite time, depending upon the weight to be sifted and the diameter of the sieve. For example, with a weight of 10 oz. of cement, and sieves 8 inches in diameter, the sifting shall be continued 2½ minutes on No. 120 sieve, 1 minute on No. 100, ¾ minute on No. 60, and ½ minute on No. 50.

The introduction of small weights, such as washers, into the cement while being sifted is to be deprecated, as they tend to push an undue proportion of the cement through the mesh, to stretch the wires and to increase to some extent the grinding. Such practice should not be allowed excepting on works of construction, where there may be a necessity for ordinary rough tests.

The sieves shall be periodically examined with great care, as moisture sometimes collects on the wire, so that when a residue test is made this moisture mixes with the cement, causing a coating on the wires, and often appreciably diminishing the area of the mesh.

The sand for standard tests shall be quartz, crushed so that the whole can pass through a 20 by 20 mesh sieve (wire No. 28 Stubb's gauge), but sufficiently coarse to allow of the whole being retained by a 30 by 30 mesh sieve (wire No. 21 Stubb's gauge).

\* Report of special committee submitted to the Canadian Society of Civil Engineers.

**3. Specific Gravity.**

The specific gravity is for the purpose of determining the degree of calcination of a cement with certainty, and is therefore of great importance. The specific gravity of a Portland cement shall be at least 3.09, and shall not exceed 3.25 for fresh cements, the term "fresh" being understood to apply to such cements as are not more than two months old. The gravimetric system is recommended for the determination of the specific gravity.

Portland cement improves with age, provided it is properly stored and kept in air-tight bags or barrels. Specifications, therefore, should not prescribe only fresh cement.

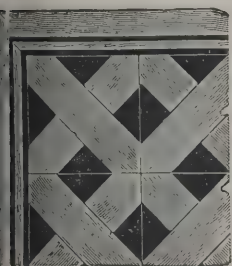
The following description of the method of carrying out this test is taken from a paper on "Testing of Portland Cement," by Gary, Trans Amer. Soc. of Civil Engineers, October, 1893:—

"The determination of the specific gravity of the cement particles by the volume-meter of Schumann is a well-known uniform method. This consists of a glass bottle of about 200 cubic centimetres (12.2 cubic inches) capacity, with a calibrated glass tube in its neck. The bottle is nearly filled with oil of turpentine, the tube tightly inserted and filled by a pipette with the same oil to the zero mark of the scale, care being taken that all air bubbles are removed. One hundred grains (3.5 ozs.) of cement is put in through the tube, which is then closed by a cork. When the fluid becomes clear, the height of its top surface is noted on the scale. The weight of the cement divided by its volume, as determined by the scale of readings, gives the specific gravity. To secure precise results, it is necessary that the temperature should remain uniform throughout the experiment, and hence vessels, cement and oil must have been kept in the same room for some considerable time. In hot weather the apparatus can be put into water of a known constant temperature. If 100 grains of cement are used a rise of 1 deg. Cent. between the two readings decreases the specific gravity 0.8 per cent."

**4. Blowing Test (for Free Lime, &c.).**

The hot-bath test for detecting the presence of free lime &c, shall be carried out in the following manner:—Mortar pats, prepared of neat cement and thoroughly worked, shall be trowelled upon ground glass plates (carefully cleaned, preferably with acid) about 5 inches long by 2½ wide and ¼ inch thick, so as to exclude all air and moisture.

The pats shall be about ½ inch thick in the centre, and



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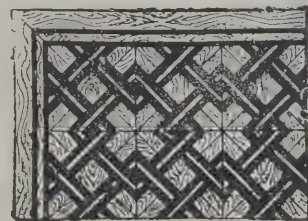
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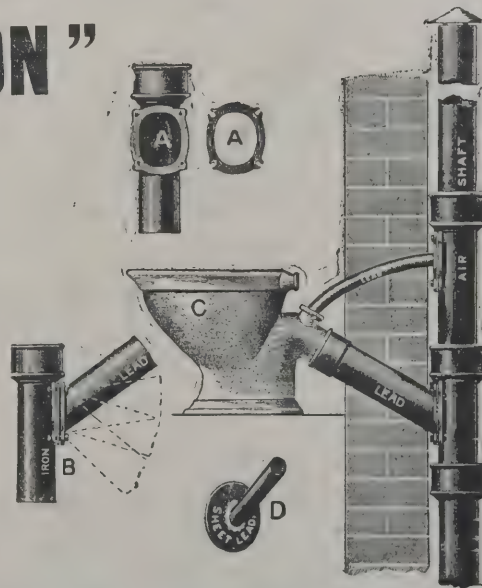
C—Shows the one size which can be adapted for 4 in. Soil Pipe, and a 4 in. x 1½ in. Invert Junction for Anti-siphon Pipes, &c.

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shall be worked off to sharp edges on the four sides of the plate. They shall then be covered with a damp cloth and allowed to remain in the air until set, after which they shall be placed in vapour in the Fajja bath tank, in which the water is to be heated to a temperature of about 130 deg. Fahr. After remaining in the vapour for six hours, including the time taken to set in air, they are to be immersed in hot water, and allowed to remain there for eighteen hours. Upon their removal from the bath the samples should not be curled up, should not have fine hair cracks nor be distorted, and should not have large expansion cracks. The samples, if separated from the glass, should break with a sharp, crisp ring. If these conditions are satisfactorily fulfilled, it is believed that no free lime is present in a form that will prove detrimental. Cements, when very finely ground, even if slightly overlimed, are not so liable to blow.

#### 5. Time of Setting.

The time of setting shall be determined by noting the time required for a sample under test to bear a needle of one-twelfth of an inch diameter loaded with one-fourth of a pound, and one-twenty-fourth of an inch in diameter loaded with one pound, the mortar under test being of the consistency of rather stiff plaster or mortar. The percentage of water used shall be stated in the report.

#### 6. Tensile and Compressive Tests.

The strength of Portland cement shall be determined by testing a mixture of cement and quartz sand. The tests shall be made in a uniform manner (both for tension and compression) with briquettes of the same form and same cross section and with the same apparatus.

Neat cement. Neat tests, except where fineness, specific gravity and hot bath blowing tests are also made, are misleading as to the value of a cement. Briquettes of neat cement, in which these characteristics have been determined and found to be satisfactory, shall bear a tensile stress of 250 lbs. per square inch at the end of three days, 400 lbs. per square inch at the end of seven days, and 500 lbs. per square inch at the end of twenty-eight days. All briquettes shall be one day in air, under a damp cloth or in a damp chamber, and submerged in clean water for the remainder of the time periods. Any cement which shows a decrease in strength on or before the twenty-eighth day is to be rejected. The decisive tests shall be considered as the average of five briquettes, although for ordinary

practice two or more briquettes may be sufficient, and in the latter case only the highest test of the group is to be taken as the strength of the cement.

In determining the tensile strength of a briquette the area of the broken surface shall be measured with great accuracy, as errors sometimes exceeding 10 per cent. are possible unless such measurements are insisted upon.

Sand and cement. In sand test the sand and cement must be thoroughly mixed together while dry. After the water has been added, either for neat or sand tests, the mortar shall be thoroughly mixed for a uniform time, suitable periods being two minutes for machine mixing and five minutes for hand mixing.

Briquettes made of one part cement and three parts standard sand, in the manner described hereafter, shall stand 125 lbs. per square inch at the end of seven days and 200 lbs. at the end of twenty-eight days.

At the end of the same period the minimum compressive strength of a mixture of one part cement to three parts sand shall be 2,000 lbs. per square inch.

[Note.—Quick-setting cements generally show a lower strength than that specified above.]

The tensile strength of briquettes mixed in the proportion of 3 to 1, or of other sand briquettes, shall not show a decrease either on the twenty-eighth day or subsequently.

In every case the quantity of water used in mixing shall be stated in the report.

The quantity of water to be used in neat tests varies with the kind of cement, fineness, &c., and hence no arbitrary quantity can be specified, the correct method being to bring all mortars to the same degree of plasticity. An apparatus similar to Vicat's, and consisting of a needle having an area of 0.4 square inches weighted to about 11 oz., may be used.

"The tests are made as follows. A ring, 1½ inch in height and 3 inches in diameter, made of non-absorbing material, is placed on a glass plate and filled with the mortar to be tested, the consistency being such that the needle does not entirely pierce it." (Trans. Amer. Soc. Civil Engineers, Oct. 1893)

A simple method for determining the standard consistency of neat cement tests is to mould a ball of mortar in the hands to a plastic state and drop the same about 20 inches on to the table. If the ball of mortar neither flattens appreciably nor cracks, the consistency is satisfactory. This process corresponds practically with the previous method. The water for standard consistency of 3 to 1 sand briquettes shall ordinarily

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be 10 per cent. of the sand and cement by weight. If the amount of water for standard consistency of neat cement of any particular brand be less than 20 per cent, then the amount of water for standard consistency of 3 to 1 sand briquettes for this particular brand shall be one-half of the amount used in neat tests.

#### 7. Preparation of Briquettes (a) Hand-made.

1. *Neat Cement.*—The moulds shall be slightly oiled on the inner side and placed upon a metal or glass plate. The mixture of cement and water shall then be thoroughly worked together (preferably in a Faija's mixer) for five minutes. The moulds shall then be filled well above the rim, so that the mortar presents a convex surface. With an iron trowel the mixture shall then be patted, commencing at the side, first gently and then harder until it becomes elastic and water appears upon its surface. No after addition of the mixture shall be allowed, as the briquettes must be of uniform density throughout. The superfluous cement shall then be removed and the surface smoothed by means of a knife or sharp-edged trowel. The moulds can only be removed when the cement has hardened sufficiently. The briquettes shall then be placed in a damp chamber (zinc lined) furnished with a lid (also zinc lined) to prevent the irregular drying of the briquettes under varying degrees of temperature. After a period of twenty-four hours the briquettes shall be laid in water and kept completely submerged during the whole period of hardening. The proportion of water used shall be stated in the report.

(2) *Sand and Cement.*—Five pieces of blotting-paper soaked in water shall be laid upon a metal or glass plate, and upon each piece of paper there shall be placed a mould, also moistened with water. The cement and sand in their specified proportions shall then be thoroughly mixed together, after which the water shall be added, and the whole thoroughly worked for five minutes. With the mortar thus obtained each should be filled by one application, so as to rise in a convex form above the edge of the mould. With an iron trowel the mortar shall then be patted, beginning from the side, first gently, then harder, until it becomes elastic and water appears upon the surface. No additional material must be added, as the briquettes must show a uniform density throughout. Superfluous mortar shall then be taken off by means of a knife or sharp-edged trowel and the surface smoothed.

The moulds shall then be carefully removed and the briquettes laid in a damp chamber (zinc lined), furnished with

a lid (also zinc lined) to prevent irregular drying. After a period of twenty-four hours the briquettes shall be laid in water and shall be kept completely submerged during the whole period of hardening.

#### (b) Machine-made.

1. If possible, briquettes prepared as above shall be subjected to a uniform specified pressure (say, for example, 20 lbs. per square inch) by means of a ram of the same gauge as the moulds, or,

2. A Bohme apparatus may be used. In this case the moulds shall be filled with about four-tenths of a pound of mortar, prepared as in (a), and shall be placed in the machine; 150 strokes shall then be applied to the core with a hammer of about 4.4 lbs. in weight (2 kilog.). After removing the mould and the core the briquettes shall be smoothed off, taken off the subjacent plate and treated as in (a).

By care in following the instructions given in (a) and (b) it will be found that handwork and machinework will give fairly uniform results. Doubtful cases, however, should be invariably decided by machine-made briquettes.

#### 8. Testing Machines.

Testing machines shall be of the positive lever automatic type, so arranged as to apply the loads quietly and uniformly at the rate of 200 lbs. per minute.

#### 9. Clips.

The style of clips shall be such as will break the briquette at the line of least section. Clips with adjustable rubber or paper composition rollers are found to work satisfactorily, and should be used.

#### 10. Chemical Tests.

Chemical tests and full quantitative analyses are strongly recommended, and preference will be given to cements of which analyses are furnished by the manufacturers.

#### 11. Adulterations, &c.

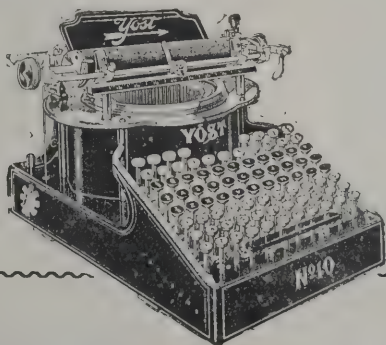
Any cement containing adulteration shall not be accepted as a Portland cement. There are also certain ingredients which should be strictly limited in their amount. If there is found to be more than 2 per cent. of sulphuric acid or 3 per cent. of magnesia, the cement should be rejected. It is understood that Portland cements only are being specified for. The silica or sand cements are in a class by themselves, need special specifications, and are not intended to be included in the present one.



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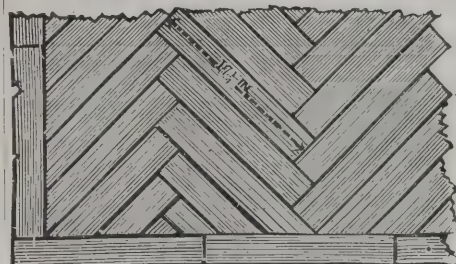
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12. *Packing.*

Cement shall either be packed in paper-lined, air-tight barrels, well constructed and hooped so that, under ordinary conditions of handling, no cement shall sift out, or if in sacks, the texture of the sacks shall be so strong and fine as not to permit of any sifting out or wasting of cement under ordinary conditions of handling. The net amount of cement, deducting the weight of the package, shall be 350 lbs. per barrel.

13. *Certificate.*

The manufacturer shall give a written certificate with each shipment of cement, stating (1) the date of manufacture, (2) the tests and analyses which have been obtained at the manufacturer's laboratory for cement taken from the day's grinding of which this shipment forms a part, (3) that the cement does not contain any adulteration.

*Recommendations.*

**Frost Test on Cement.**—In case of experimental tests made for the purpose of determining the action of cements when exposed to severe frost, it is recommended that the cements be mixed at a temperature below freezing, with cold water, cold sand and kept exposed to ordinary winter weather, just as they would be exposed in actual construction of masonry. A description of what is done in this connection should be kept for comparison with other results, and the records of such experiments filed with the secretary of the Canadian Society of Civil Engineers.

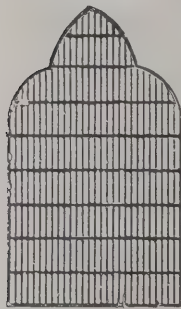
It has been observed in hot-bath tests that little pustules or eruptions take place on the surface; instances are also given of the glass shattering in the hot-bath test without separating from the cement or without any other sign of failure on the part of the cement. Members of the Society are requested to observe the causes or reasons therefor, and report the same to the secretary of the Society.

Inasmuch as small consumers are rarely able to gauge or mix their test specimens with a mechanical mixer, it is advised that where tests are made by hand mixing due discrimination shall be made in comparing the results with tests made by mechanical mixing. Hand mixing done by an expert will probably agree closely with mechanical mixing, but for ordinary testing the mechanical method will give more uniform results, inasmuch as no skill or dexterity is required to produce approximate uniformity.

Cement testers, where possible, should make long time tests to see whether or not there is any connection between high early tests and future falling off in tensile strength, and whether, when mixed three to one with sand, the same or similar deterioration is observed. These tests should, if possible, be carried on for several years. It would be of the utmost value to the profession to obtain positive data on this point from engineers in charge of municipal, university or other laboratories who are in a position to supply it.

**IMPROVEMENT OF SLUMS IN LIVERPOOL.**

A LECTURE was given last week in Birmingham by Mr. Joseph B. Colton, deputy-chairman of the housing committee of the Liverpool City Council, on "What Liverpool has done with its Slums, and the Rehousing of the Displaced Population." The Liverpool Corporation realised their responsibility as long ago as 1864, when they passed through Parliament an Act known as the Liverpool Sanitary Amendment Act, which was still in force, and contained powers which no other municipality possessed and could not now obtain. The main feature of the Act was its simple procedure. The medical officer scheduled a number of back-to-back houses, and, these having insufficient through ventilation, as "unhealthy and unfit for human habitation." The schedule, which might contain from 500 to 1,000 houses, would come formally before the Council, and was passed on to the grand jury at the next assizes. After considering the report and the owners' evidence in defence of their property the grand jury would make a presentment, and the property would be condemned. The owners could compel the Corporation to buy their property, and, in the event of the parties disagreeing, an arbitrator was appointed by the Local Government Board, and his decision was final. Under this Act the Corporation had demolished about 8,000 to 9,000 houses, but it was not till 1884 that they realised there was another side to the work. Although they were knocking houses down they never thought of what became of the inhabitants, and the land was sold for business premises or to private builders, who erected houses, but let them at rents which the displaced population could not afford to pay. Time rolled on, and it was not until 1885 that Liverpool's first attempt was made at building. In December of that year Victoria Square was

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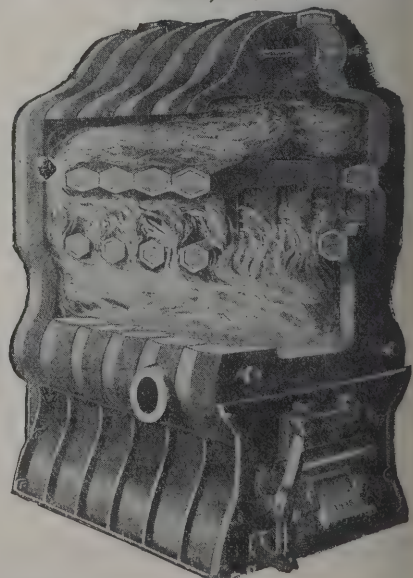
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opened. The building was five storeys high, and contained 269 tenements and offices. The one-room tenements let at 1s. 9d. per week, the two-roomed houses let at from 4s. 6d. to 3s., and the three-roomed at 5s. 6d. to 5s. per week. The block stood on 9,000 square yards, which for housing purposes they debited at a cost of 22s. 6d. per yard (10,125 $\frac{1}{2}$ ), and the building cost was 57,952 $\frac{1}{2}$ . The gross rental of the tenements was 2,796 $\frac{1}{2}$  16s. and of the shops 236 $\frac{1}{2}$  per annum. For ten years the actual receipt was 94 per cent., and the block paid them 2 $\frac{1}{2}$  7s. 6 $\frac{1}{2}$ d. per cent. The displaced population was not in occupation, but the dwellings which they called "artisans' dwellings" afforded a great boon to the working classes, although they presented no example of the attempt of the committee to solve the great problem. In 1890 the Juvenal Street dwellings were completed, partly three and partly four storeys high. They contained 101 tenements, comprising forty-six one-roomed let at 2s. 9d. to 2s., fifty-three two-roomed from 5s. to 3s. 9d., and two three-roomed at 5s. 6d. per week. Here the experiment was tried of a flat roof, where children might play in safety, but it was not a success. The gross annual rental was 878 $\frac{1}{2}$  17s., of which 92 per cent. has been received during the past ten years, and only 372 $\frac{1}{2}$  11s. 5d. lost in arrears. The property cost 16,166 $\frac{1}{2}$ , and paid 3 $\frac{1}{2}$  1s. 10 $\frac{1}{2}$ d. per cent. Again the displaced population did not get into occupation, and the houses were occupied by the artisan class. No further building took place until 1896 and after the city had been enlarged. A new policy was insisted upon by the increased Council, and the result was that the old procedure of demolishing the slums and turning the people into the streets without a home to go to was entirely reversed. An assurance was given that the housing committee would erect houses for the displaced occupiers and those they were turning out, and in April 1897 Gildart's Garden dwellings were opened. They were of three types comprised in five blocks, each three storeys in height, and containing eighty-eight tenements. Eighty-six houses contained living-room and bedroom let at 3s. 6d., 2s. 9d., 2s. 6d. and 2s. 3d. per week, according to the different floors; two three-roomed houses let at 4s. 6d. per week. The buildings stood on 1,685 square yards, which were valued at 1,828 $\frac{1}{2}$  16s.; the cost of the buildings was 7,687 $\frac{1}{2}$  15s. 2d., gross annual rental 643 $\frac{1}{2}$  10s., and the annual receipt 93 per cent. From 1897 to 1901 empty houses had accounted for 37 $\frac{1}{2}$  18s. 6d. per annum, and arrears for 98 $\frac{1}{2}$  14s. 8d. per annum. No one, unless he or she had lived in a slum and been displaced, was eligible to become a tenant of these houses. A sub-committee was appointed, and was

known as "the letting sub-committee," which had charge of all buildings and considered all applications. They had found that changed surroundings altered the whole family. After that experiment their policy had gone straight forward, and there was no voice in Liverpool left to advocate any other policy of building than that for the dispossessed. In April 1901 they opened the Dryden Street dwellings, comprising 182 tenements, let at prices ranging from 6s. to 3s., and the whole of these were provided with hot water. They were so built that in case of epidemic or vermin it was easy to wash the whole house, and in a few hours have the premises thoroughly cleansed. The cost of the land and buildings was 30,727 $\frac{1}{2}$ , and the gross annual rent was 1,586 $\frac{1}{2}$  4s. 4d. Dwellings in Kempston Street and Fontenoy Street had been built at a cost of 17,900 $\frac{1}{2}$  (gross rental 887 $\frac{1}{2}$  18s.), and 3,847 $\frac{1}{2}$  (gross rental 192 $\frac{1}{2}$  8s.), respectively. Altogether they had 1,618 dwellings erected or in course of erection, and they were now housing 6,540 people. There were yet 9,943 unhealthy and structurally insanitary houses to be dealt with, at an estimated outlay of 342,000 $\frac{1}{2}$ . The committee was pledged to rehouse all the dispossessed as the work of demolition proceeded, and it was estimated that this would mean the erection of 6,000 houses at a cost of 900,000 $\frac{1}{2}$ . All this vital and important work was much hindered by the Local Government Board by the short period allowed for the repayment of loans. Most of their loans were for 30 years on buildings and 50 years for land, but recently the Board had granted them 40 and 60 years respectively. The demolition work to date for interest and sinking fund had cost the city 17,100 $\frac{1}{2}$  per annum, and the rehousing, after allowing for all rents, had cost 4,200 $\frac{1}{2}$  per annum.

### BRIGHTON AQUARIUM.

ANOTHER report on the improvements proposed at the Aquarium has been prepared by a committee of the Brighton Town Council. On September 10, 1901, the committee recommended the reconstruction of the concert-room and of the fernery and waterfall; the renewal of the roof, ventilation and warming; the installation of the electric light, the improvement of the tanks and the carrying-out of general repairs and redecoration at a cost, estimated by Mr. A. Hessell Tiltman, whom the committee had consulted, at a sum not exceeding

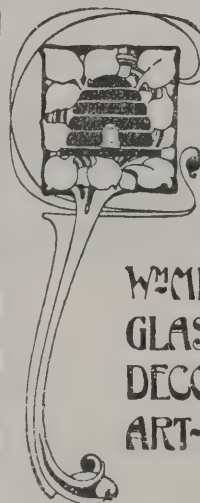


**LIVERPOOL.**

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25,000*l.* Mr. Tiltman was willing to superintend the execution of the work including the preparation of the necessary plans, &c., for the usual commission of 5 per cent. upon the total cost. The Council generally approved this scheme, and the engagement of Mr. Tiltman at a sum not exceeding 5 per cent. upon the actual outlay upon the works, his remuneration not to exceed 1,250*l.* in the whole. In February of the present year a further report was presented to the Council, which included provision for electric machinery at the Aquarium, and this increased the estimate to 29,098*l.* This amended scheme was, however, sent back to the committee for still further consideration, and after consultation with other members of the Corporation and Mr. Tiltman, the latter was instructed to report with an estimate of the cost of putting the building into structural and decorative repair. The result was that on April 24 a new proposal from which "all important structural alterations were omitted," and the cost reduced from 29,098*l.* to 15,100*l.*, was before the committee, but a decision was not arrived at, and Mr. Tiltman was once more instructed with regard to the alteration of the building.

Many attractive features are embraced in "Scheme No. 5," which, under date of July 21, 1902, Mr. Tiltman has submitted to the committee, who, however, while submitting the plans to the inspection of members of the corporate body, are unable to recommend their adoption. Under the latest proposals, to carry out which the architect suggests the sum of from 38,000*l.* to 40,000*l.*, it is proposed to remove the whole of the existing skylights, balustrading and buildings at the present terrace and Madeira Road levels, and upon the disappearance of these to erect a large glass-covered avenue or arcade, in which on one side provision would be made for a large number of lock-up shops. Mr. Tiltman thinks that these should be congregated together, be well arranged, and suited for the sale of light and fancy goods. On the other side of the arcade would be suitable accessories, such as a music annexe, café restaurant, tea and palm houses, ferneries and arbours, while the remaining portions of the site at this terrace level could be concentrated and utilised as an outdoor promenading space, with outside bandstands, café, tea gardens, seats, playing fountains, ponds, and the like. The arcade would be 554 feet in length, and will be glazed on the top and on the southern side in such manner as with suitable warming, &c., to serve as a sheltered and agreeable resort in the winter months, while in the summer, with all the doors on the southern side thrown open the greater part of its length it would be, Mr. Tiltman thinks, an equally

attractive promenade. Artificial lighting and ventilation during the day as well as night throughout the institution is spoken of, and the upper part or terrace level (the area of which would be largely increased by the omission of all sky lights) has been dealt with as a place of free admission throughout, and by the treatment of the upper portion, the Aquarium part, the report states, must necessarily be relegated more to functions of an educational institution, for which a small fee would be charged.

Little or no structural work was proposed under the scheme in the Aquarium itself, with the exception of the covering in of the openings now occupied by the sea-lion house, inclined ways, skylights, &c., the reversion to its old effect of the water-fall, the lowering of the ceiling of the present concert-hall and the utilisation of its site for further piscatorial exhibits, and the general simple decorative repair of the interior.

It is proposed, however, that the present "ugly and ill-arranged entrances" should be removed and one entrance substituted for the Aquarium, one to the covered way to the arcade and the other to the open path by way of the terraces. The cost of an attendant would, however, be saved, as the three entrances would be controlled from one pay box, and combined with the entrances would be shelter places, where visitors might in inclement weather wait their admittance to either of the two now separated establishments. These waiting spaces would be so arranged that in stormy weather they might be enclosed on any side with rolling screens, thus affording shelter from wind and rain, and also allowing the space to be closed at night. The necessity for the alteration of the present plan at this point enabled Mr. Tiltman to secure a well-grouped entrance-block "more worthy in design of the purposes of the proposed dual establishment." The terraces would be levelled throughout, reasphalted outside and suitably paved inside, fitted with ponds, fountains, &c., all formed of majolica, and the new buildings would be constructed both in walls and roofing largely of steel and iron, contrasted by certain portions in plain brickwork, and copper sheet roofing. The terraces would be liberally provided with verandahs, seats, shrubs, plants and playing fountains; "and, in fact," adds Mr. Tiltman, "the whole buildings and ground would be treated structurally and decoratively in a manner to be attractive in expression and not extravagant in its upkeep." The committee, who recommended that Mr. Tiltman be paid 500*l.* on account of his commission, hope to be in a position shortly to report to the Council with recommendations for the execution of necessary repairs to the Aquarium.

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# The Architect.

## THE WEEK.

It was announced on Wednesday that His Majesty the KING has been graciously pleased to approve the appointment of Sir BENJAMIN BAKER, K.C.M.G., to be a Knight Commander of the most Honourable Order of the Bath, in recognition of his services in connection with the construction of the Nile reservoir. The KING has also been pleased to give directions for the following promotions in and appointments to the Most Distinguished Order of Saint Michael and Saint George, in recognition of similar services:—To be an Ordinary Member of the First Class, or Knights Grand Cross: Sir WILLIAM EDMUND GARSTIN, K.C.M.G., Under-Secretary of State for Public Works in Egypt. To be Ordinary Members of the Second Class, or Knights Commanders: Major ROBERT HANBURY BROWN, R.E., C.M.G., and Mr. WILLIAM WILLCOCKS, C.M.G., of the Egyptian Irrigation Department. To be an Honorary Member of the Second Class, or Knights Commanders: HUSSEIN FAKHRY PASHA, Egyptian Minister of Public Works. To be Ordinary Members of the Third Class, or Companions: Mr. ARTHUR LEWIS WEBB, Mr. KYNASTON EDWARDS VERSCHOYLE, Mr. MAURICE FITZMAURICE, Mr. GEORGE HENRY STEPHENS. Some disappointment is sure to be caused owing to the absence of the name of Sir JOHN AIRD, M.P., or of any of his representatives from the list of honours. It would be an error, as SHAKESPEARE says, "to forestall prescience and esteem no act but that of hand." At the same time, the enormous responsibilities which rested on the contractors deserve recognition. If a mistake in the plans arose or in any of the preliminary arrangements the Egyptian mind would be indifferent, but the slightest failure in the masonry of the Assouan dam would mean a loss of English prestige. There is no doubt that precedent has been followed, but that makes the case more to be regretted. If contractors are to be judged no more deserving of distinctions than the machinery they employ, it cannot be expected that they will take more than a financial interest in their works.

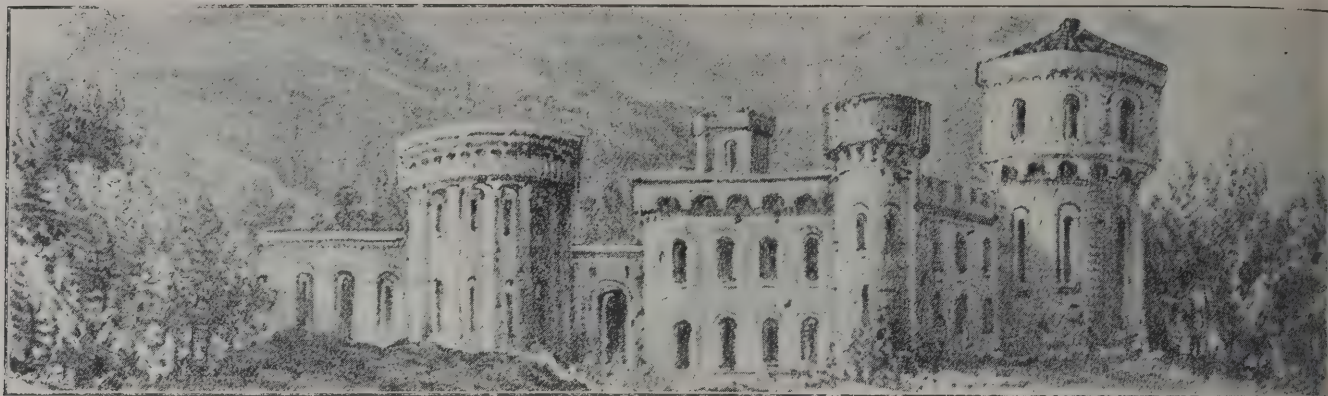
ALTHOUGH architects must always desire to see regulations enforced which will put a stop to defective building, or at least will restrain some of its inconveniences, they cannot deny that the elasticity of the by-laws which are now supposed to form a standard system of building should be amended. The official world always thinks of the letter rather than the spirit of a regulation, and by-laws which should be altered to suit circumstances are administered as if they were as inexorable as the old edicts of the Medes and the Persians. A meeting was held on Monday at 29 Bloomsbury Square, at which several architects attended for the purpose of endeavouring by means of association to obtain some relief from the ultra-rigid system which is now enforced. The following resolution was adopted:—"That, in consequence of the general complaints about the oppressive nature of the model by-laws (drawn up originally to meet the needs of urban districts only) in rural districts or rural portions of urban districts, it is thought that the time has come for the formation of an association or the purpose of drawing public attention to the matter, and it is hereby resolved that an organisation be now formed, to be called the Building By-law Reform Association, to promote amendments of building by-laws so as to limit official control of private buildings to that only the public health and safety demand, and thus remove encroachments on individual liberty." The resolution is sufficiently expressive. The by-laws when originally drawn up were believed to need modifications which were suggested by local authorities. Instead, however, of seeking some latitude in order to suit local circumstances, efforts have been made to give even more rigidity to the regulations than was contemplated in the draft schemes. It is no doubt much easier for assistants to have a hard-and-fast system which will not require the exercise of any judgment for its adaptation to meet particular cases, but something else should be calculated besides their convenience.

GENERAL practitioners in medicine usually decline to give particulars of their charges, or even to state the number of times they have visited a patient. An architect's account is presumed to offer less difficulty to those who wish to examine it, for it is taken to be at the most 5 per cent. on the outlay. When it is found that an account will not work out at that rate there is discontent. An example of the difficulty which people find in recognising any other basis was presented at some late meetings of the Guardians of Newton Union in Devonshire. New works were to be carried out in connection with the workhouse. For that purpose it was necessary to make plans of existing buildings, which were to be removed in order to furnish part of the site. Mr. SEGER, the architect for that survey, claimed seven guineas. Some of the Guardians, including the chairman, declined to approve of the account, on the ground that the 5 per cent. commission was to include everything. The chairman repeatedly asserted that there should be only one charge, 5 per cent., and that he had never heard before of payment for plans of sites. However, the good sense of the majority prevailed, and the charge was admitted. It is hard that gentlemen holding administrative offices know so little of architectural practice as to imagine it is of so simple a nature that one charge can cover the vast variety of incidental work which may arise, and which the architect can no more be compelled to execute than to discharge the functions of a lawyer in connection with the building.

THE competition for signs in Paris has terminated. That kind of contest does not appear adapted to French dispositions, and the announcement of prizes was at once received with dissatisfaction. The first award of 2,000 francs has been made to M. ADOLPH WILLETTE, whose name was associated with the Chat Noir. Indeed, one of his works was a sign which served for that cabaret. The two premiums of 1,000 francs each were awarded to M. ABEL TROUCHET for three signs, two of them being luminous; and M. J. H. AVY for a sign part of which was in forged iron. Five prizes of 500 francs were also given. They were obtained by MM. SARAZIN, SAUVAGE and RÉGIUS for signs in hammered iron, M. E. SCHENCK for a sign in iron and copper, M. FRANK SCHEIDECKER for a sign in copper repoussé, M. DERRÉ for two signs in plaster, and M. TESTARD for two cut from plate-iron. Six prizes of 250 francs were also awarded to MM. RÉGIUS & BOCHE, M. PERRAUD, M. PRIGNOT, M. MERCIER, M. D'HIERE and M. MOREAU-VAUTHIER. In addition several silver medals were awarded.

It was announced that the Venetians did not appeal for aid to other countries in order that St. Mark's Campanile could be re-erected. That declaration was creditable to the people, and suggests that Italy is becoming self-reliant. An appeal was, however, made by the Royal Academy, and Academicians and Associates had given donations. There has been some conversation between the president, Sir E. J. POYNTER, and the Sindaco on the subject, and as a result a letter has been sent to Mr. T. G. JACKSON, R.A., the treasurer of the Academy, from Venice. In the letter Count GRIMANI willingly accepts in the name of the Commune of Venice the action of the Royal Academy in appealing for material aid towards the reconstruction of the Campanile and Loggia of SANSOVINO, and will receive with gratitude the contributions from artists and dilettanti which are collected; he only stipulates that the contributions shall be given and received as offerings from individuals, and be accompanied by the names of the contributors, in order that there may be no appearance of a public subscription, which it would be unbecoming in the Italian nation and the city of Venice to receive. Sir E. J. POYNTER accordingly makes "a further appeal to artists, and to all those whose love of the beautiful has led them to Venice, to join in swelling this list, that the Royal Academy may be able to forward a contribution worthy of the numbers who yearly flock to that treasure house of all that is most exquisite in art, as an evidence of their genuine sympathy with the Venetians in their loss."





PAINTERS' ARCHITECTURE: TITIAN.

### RUSKIN AND TURNER.\*

THE appearance of the pamphlet entitled "Notes on the Turner Gallery, Marlborough House," at the end of 1856, enabled a great many people for the first time to realise the character of JOHN RUSKIN as a writer. It was the earliest publication bearing his name which was obtainable at a shilling. Poems by him had been read in annuals and essays in a few magazines. The first volume of "Modern Painters" was published in 1843, but it and the succeeding volumes were expensive. "The Seven Lamps of Architecture," "The Stones of Venice," were only meant for a few, and were considered to be professional treatises. In the Notes on the TURNER pictures he gave extracts from "Modern Painters," and in that way enabled the general public to form a notion, it may be an inadequate one, of his ability as a writer. Many of his characteristics were evident. It was manifest that he was most laborious in obtaining information, and his criticism was based on a study of pictures which might be called microscopic. It could be seen, too, by his remarks on some of TURNER'S works, that he was as close a student of mountain scenery as if he intended to become a painter or a geologist. The appendix, which related to the protection of pictures and the arrangement of picture galleries, also suggested that he was no mere amateur. In fact, the RUSKIN of that time was to be inferred from the pamphlet of eighty-eight pages. On that account it was no wonder the Notes were quickly bought up, and in the course of the year no less than five editions of it were brought out, a success which is unprecedented in the history of catalogues.

As a large part was derived from "Modern Painters," we can understand RUSKIN'S objection to reprint it among his miscellaneous writings. It is now being published with a catalogue of TURNER'S water-colour drawings and various other notices by him in a handy volume uniform with the cheap edition of RUSKIN'S works. The book has been edited by Mr. E. T. COOK, not in the way which is now becoming common, that is, writing a short preface with some general remarks about the subject that is treated. Mr. COOK supposes the Notes will be used by students of the TURNER collection; and he has endeavoured by cross-references and remarks, as well as by a comprehensive index, to make the volume such that it can be made use of both in the National Gallery and for reflection afterwards.

The majority of our readers are no doubt aware that, according to RUSKIN, there were four periods in TURNER'S career, during each of which he wrought with a different aim or with different powers. Born in 1775, admitted to the Academy schools in 1789, and elected an associate in 1799, it is assumed that his student period did not begin until 1800 (the earlier years were afterwards described as "development"), and then continued till 1820. During that time he imitated successively the works of the various masters who excelled in the qualities he desired to attain himself. But it is pointed out that though an imitator, TURNER

was not a copyist:—"Instead of copying a VANDEVELDE, he went to the sea and painted *that* in VANDEVELDE'S way. Instead of copying a POUSSIN, he went to the mountains and painted *them* in POUSSIN'S way. And from the lips of the mountains and the sea themselves he learned one or two things which neither VANDEVELDE nor POUSSIN could have told him, until at last, continually finding these sayings of the hills and waves on the whole the soundest kind of saying, he came to listen to no others." The second period was between 1820 and 1835, in which he applied the principles he had acquired, and sometimes endeavoured to produce beautiful compositions or ideals, instead of transcripts of natural fact. In the third period, which continued till 1845, he reproduced as far as he could the simple impressions he received from nature, associating them with his own deepest feelings. In 1845 his health gave way, and his mind and sight partially failed. The pictures produced from that time to his death in 1851 are wholly inferior in value. The works which mark the period of central power are the *Ulysses*, a ship entering on its voyage, and the *Old Temeraire*, a ship closing its voyage for ever.

In describing the pictures selected RUSKIN was not afraid to point out their deficiencies. Thus the *View in Wales*, because it was supposed to be in WILSON'S manner, "has not a single Welsh character," and some careless scratches in the foreground give occasion to praise Heaven, "for," says RUSKIN, "there is an impatience of genius as well as a patience—and woe worth the man who could have painted such a picture as this without being tired of it." Again, in *The Shipwreck* it is observed that TURNER'S large waves are always deficient in lustre and liquidity, and he was unable to express the construction or softness of foam. When in 1842 he was over-liberal with foam in his *Snowstorm*, of which he was an observer, being on board the *Ariel*, it was condemned by the critics as mere soapsuds and whitewash. Apropos of some of the Italian views, it is said that they present the worst possible example of TURNER'S colour, for "neither in his actual views of Italy has TURNER ever caught her true spirit except in the little vignettes to ROGERS'S poems; none of his large pictures at all equal them." In his description of the *Ulysses Deriding Polyphemus* he does not pass over the error by which the Cyclop's cave is made too small; "considering that TURNER was at this time professor of perspective to the Royal Academy, and that much outcry has lately been raised against supposed pre-Raphaelite violations of perspective law, I think we may not unwarrantably inquire how our professor supposed that *that* Cyclops could ever have got into *that* cave." He is no less sarcastic about the gorgeous Lord Mayor's barges becoming representative of the Homeric black ships. The *Regulus Leaving Rome* is declared to be very disgraceful to TURNER, and is a wicked relapse into the old rivalry with CLAUDE. The *Bridge of Sighs*, which so many have admired, is condemned as one of the worst of his later pictures, for at the time "he had quite lost the power of painting architectural detail, and his feeling for Gothic architecture had never at any period of his life been true, owing to his early education among classical models."

\* *Ruskin on Pictures*. A Collection of Criticisms by John Ruskin not heretofore Reprinted, and now Re-edited and Rearranged. Vol. I. Turner at the National Gallery and in Mr. Ruskin's Collection. (London: George Allen.)



The second catalogue may be less eloquent, but it is more interesting in a biographical sense. RUSKIN was commissioned by the Trustees of the National Gallery to prepare three hundred examples of TURNER'S drawings from nature for exhibition. An enormous amount of labour was involved in the classification, but RUSKIN did not spare himself, for he had a strong conviction of the value of such an exhibition as a means of artistical education. They were not appreciated; he did not mind his own wasted time, but it was a frightful discovery for him that "the most splendid genius of the arts might be permitted to labour and perish uselessly." The second catalogue, therefore, reflects RUSKIN in his most sanguine mood. He was learning his business, as he said, in the preparation of the drawings, and the illustrative notes to the catalogue enable us to perceive the effect of TURNER'S drawings in influencing his growth. He took it for granted that every stroke of TURNER'S had a meaning, and he pondered until he had ascertained, as he thought, what that meaning was. "You cannot admire, nor even see TURNER, until your admiration shall consist primarily in recognition of the facts he represents, as being facts known to you as well as to him." This is true not of TURNER only, but of all great artists; but especially of TURNER, in so far as every one of his pictures is a statement of new facts, so that you must take another day's hard work with nature before you can read it (other artists representing the same thing over and over again). TURNER was very jealous about anybody watching him at work, for he was strong in insular selfishness, and had no wish to impart his discoveries to others. It is therefore very interesting to watch the efforts made by RUSKIN in order to explain the mysterious success of many of the artist's drawings. All this might have been obviated by a little communicativeness on TURNER'S part. His manner of sketching throughout life is defined by RUSKIN in one place as "the utmost possible quantity of information put into the smallest possible space, but *always* arranged for a perfect picture."

The notes on the exhibition of TURNER'S drawings belonging to Mr. RUSKIN, and on the copies by himself in that artist's style, are also given. As they were written in 1878 they express RUSKIN'S views at a time when his mind had gone through many revolutions. He expresses his experience when he says:—"As in my own advancing life I learn more of the laws of noble art, I recognise faults in TURNER to which I was once blind; but only as I recognise also powers which my boy's enthusiasm did but disgrace by its advocacy." The grouping of TURNER'S periods becomes somewhat different. The first is schooldays from 1775-1800; the second, rock foundations, Switzerland, between 1800-10; the third, dream-land, Italy, 1810-20; the fourth, reality, England at rest, 1820-25; the fifth, reality, England disquieted, 1825-30; the sixth, meditation, England passing away, 1830-40; the seventh, minstrelsy, the passionate pilgrim, 1830-40; the eighth, morning by the riversides, 1830-40; the ninth, again the Alps, 1840-45; and the tenth, sunset, 1840-45. It is possible that in some of those periods Mr. RUSKIN was describing the changes in his own life. Thus the seven drawings of the "Passing-away" group show a cathedral, four castles and two abbeys. "The reader," remarks RUSKIN, "may suppose that I chose them from my love of architecture, but they have come to me as fate appointed." He goes on to say:—"Every one of the seven was composed by TURNER to do honour to some of those buildings of which it is England's proud boast that she needs no more. And instead of cathedrals, castles or abbeys, the hotel, the restaurant, the station and the manufactory must, in days to come, be the objects of her artists' worship. In the future England and Wales series the Salisbury terminus, the Carnarvon buffet, the Grand Okehampton Hotel and the United Bolton Mills will be the only objects thought deserving of portraiture. But the future England and Wales will never be painted by a TURNER." The words were written in a pessimistic spirit, but they suggest the end of an era of which TURNER and RUSKIN might be selected as representatives.

Mr. COOK has already shown his knowledge of RUSKIN by his "Studies," which is one of the best books on the writer, artist, professor and reformer. It would be im-

possible for anybody who had not already endeavoured to grasp the manifold qualities of RUSKIN'S nature to edit the notes and catalogues in the manner it has been done, although from the modesty of the claim it may be suspected of being little more than a mechanical office. The relationship between RUSKIN and TURNER was remarkable, if not unique. The majority of art critics have no personal interest in artists, whom they look on as mere producers, and often do not esteem as men. In a mysterious way TURNER became the means of drawing forth powers in RUSKIN which the votary of the painter did not anticipate. Both enjoyed the same scenes in Switzerland, and the terror which belongs to the sublime was impressed by the views of the mountains on both. TURNER expressed what he felt in noble drawings, but in RUSKIN it resulted in efforts to transform the character of the world. Indeed, in all literature there are few things more curious than to find RUSKIN, who had soared so high with TURNER, coming to the conclusion that the formation of a new charity organisation should be the aim of every superior man. "If we help to feed and clothe and lodge people, then we may be rewarded by becoming more dexterous in art." What he taught he practised, and there was no boasting or cant when he said, "I myself have washed a flight of stone stairs all down, with bucket and broom, in a Savoy inn, where they hadn't washed their stairs since they first went up them, and I never made a better sketch than that afternoon."

Mr. COOK, by his arrangement of the notes and the extracts from RUSKIN'S works, causes the volume to be more expressive of RUSKIN than any other volume in the series. There are several illustrations of the most prized of TURNER'S drawings, including the *Splügen Pass*, which was presented to RUSKIN by his friends, and the volume must satisfy the most exacting of RUSKIN'S admirers.

#### THE ENCYCLOPÆDIA BRITANNICA.\*

THE expedition with which the early volumes of the new edition of the "Encyclopædia Britannica" were issued appears to be increased as the end of the series approaches. The whole can now be arranged for by those who may wish to make 1902-3 memorable for individuals or public institutions by presenting the Encyclopædia as a Christmas or New Year's gift. It may be said without the least exaggeration that for such a purpose it would be impossible to find anything which is likely to be equally useful in promoting general knowledge.

The prefatory essay is by Professor KARL PEARSON, F.R.S. The subject is the Function of Science in the Modern State. The object of the essay is to show how in our time there is a struggle for existence between nations as well as between individuals, in which the combined capacity of each people must be directed in such a way as to become effectual. With that view teachers may be considered as captains of industry. Unfortunately, with us little attention has been devoted to their training. There is much which is sarcastic, and yet at the same time merited, in Professor PEARSON'S essay. As he points out, it is only in England that the offer of teaching posts to wranglers immediately after the appearance of the class lists would be accepted as sensible. For, he says, to give a man "control of a higher craft school because he has taken a brilliant university degree in pure science is a common illustration" of the present chaos in technical education in England. In the higher class schools or colleges there is the same absence of recognition of what is necessary, for "we have started again on the wrong system, multiplication of little centres doing their individual best, no doubt, but not what is best for the nation." The essay is thoroughly outspoken, and should receive attention from those who are responsible for the education of the country.

There are several articles which will be found interesting

\* The new volumes of the *Encyclopædia Britannica*, constituting in combination with the existing volumes of the ninth edition the tenth edition of that work, and also, supplying a new, distinctive and independent library of reference, dealing with recent events and developments. The eighth of the new volumes, being volume xxxii, of the complete work. (Published by the *Times*, London.)



to those engaged in construction. Stone cannot yet be dispensed with in building, and a contribution by Dr. MERRILL, the New York State geologist, describes the extent to which in America machinery is used to cheapen the operations of quarrying. He says:—

In limestones and marbles, and in the softer sandstones, channelling machines driven by steam are employed, by which vertical or oblique grooves can be cut with great rapidity to a depth of several feet. A level bed of rock is cleared, and on this are laid rails, along which the machine moves. After the channels are cut, a row of holes is bored perpendicular to the former at the desired distance below the surface of the bed, and by driving wedges into these the required blocks are separated. When the beds of stone to be quarried are thin, and when to remove the whole of the overlaying mass of earth or rock would be too expensive, it is found convenient to treat the quarry as if it were a mine, and to rely on methods similar to those practised in mining. A horizontal bed of rock is usually opened at its outcrop on some hillside. If this is impracticable, a shaft or stope is excavated to reach it, and if dimension stone is required, a deep horizontal groove is cut near the top or the bottom of the bed. The quarry face is then divided into blocks by saw-cuts, channels, or rows of drill-holes, and the blocks are separated by wedging or blasting. As the excavation progresses, portions of the rock are left in place as pillars to support the roof.

Railways are dealt with by a dozen specialists, by whom not only methods of working and construction are explained, as exemplified on the different lines, but such subjects as economics, legislation, accidents, finance, &c. Owing to the sound construction adopted in the early days in England, it is now more difficult to introduce improvements into this country than on the more elastic lines of America and on the Continent. River engineering is treated by Professor VERNON-HARCOURT, who includes such late works as the movable frame weirs on the Seine and the Spree, and the lifting-gate and weir at Richmond. In the article on Road-making it is pointed out that whereas brick paving has been in use for twenty years in America, in the United Kingdom, although bricks are produced unequalled for hardness and finish, no serious attempt has been made to introduce a tough brick for roadways that will neither chip nor wear smoothly. Another important variety of construction, viz. Ship-building, is dealt with by Mr. P. WATTS, the Director of Naval Construction.

Social progress in Great Britain is another of the subjects in which several writers have co-operated. Canon BARNETT sets forth modern efforts to deal with the housing of the working classes. From the statistics given it is shown there is a tendency now among the humbler people to move to the outskirts. The author appears to believe that overcrowding is due chiefly to insufficient means of locomotion. Sociology is also considered for the first time in a separate article. It might be taken as an introduction to Professor PEARSON'S essay, for it is also concerned with the State as an organic whole. To a great extent the most advanced parts of the world appear to be returning to Greek ideas.

Art has to be recognised in all the volumes of the Encyclopædia. "Schools of Painting" describe the British, French, Belgic and those in other European countries, as well as in the United States. Professor VAN DYKE declares that the history of painting in the United States is almost entirely a nineteenth-century production. COPLEY, the father of Lord LYNDHURST, lived until 1815; WEST until 1820. The style resembled that of the British school. The middle or second period began with DOUGHTY and COLE. In the latest school French influence is most apparent. We are told that "from their French training many of the American artists have been charged with echoing Parisian art, and the charge is partly true. They have accepted French methods because they think them the best, but their subjects and motives are sufficiently original." It is also remarked of Mr. WHISTLER, who by birth is an American, that "he is an example of the modern man without a country. No nation can claim him as an artist because he seems to have no nationality." It is not, however, said that Mr. WHISTLER or artists who are equally cosmopolitan, suffer because they believe that art, like capital, is of no one country. In describing the British school Mr. SPIELMANN narrates the changed conditions in collecting

works of art. Examples of old masters are preferred by many. It is concluded that "to a wide appreciation of all types of pictorial art has succeeded a grudging and careless estimate of the value of the bulk of artistic endeavour. Only a few branches of production are still encouraged by anything approaching an efficient demand. Portraiture is the mainstay of the majority of the figure painters." It is evident the sociological aspects of the case demand more consideration than they have received. We cannot have progress if living artists are sacrificed to the dead, nor can we compete with foreign nations if in so important a class of work as painting the country can only point to the labours of a past age. There is little doubt that occasionally a modern painter in England, by catering for a limited class of people, may obtain higher prices for his works than they merit. But those cases are few, and they are less injurious, perhaps, than the paying of enormous sums for the portraits of a courtesan of a former period. The companion article on Sculpture relates mainly to the English and French schools, and is amply illustrated with photographic views.

Among the biographies is one of Mr. R. NORMAN SHAW, R.A. In describing his works it is said that New Scotland Yard is the finest and most complete. In conclusion, it is stated "it is largely owing to him that there is now a distinct tendency to approach architecture as the art of building rather than the art of designing, and the study of old work as one of methods and expressions which are for all time, rather than as a means of learning a language of forms proper to that period." Among the other artists whose biographies appear in the volume are PUVIS DE CHAVANNES, DANTE ROSSETTI, Sir W. B. RICHMOND, THEODORE ROUSSEAU, GIOVANNI SEGENTINI, W. B. SCOTT, &c.

Archæology is not neglected. The article on Roman Walls suggests the diminished certainty about the history and character of the great wall in Britain. JONATHAN OLDBUCK would be amazed to find it stated that "the vallum can no longer be explained as of old, but it is still a puzzle." Silchester is described, and several plans enable the reader to realise the arrangements of the Roman houses. The latest explorations in Rome are described by Professor NORTON. SCHLIEMANN'S discoveries are narrated by Mr. D. G. HOGARTH.

The variety and interest of the contents of the Encyclopædia continue undiminished, and possessors will have the satisfaction of knowing that equal care has been taken throughout, and from the uniformity of excellence the relative value of the volumes is beyond calculation unless by means of personal preference.

## THE SOCIETY OF ARCHITECTS.

A MEETING of the Society of Architects was held last evening at St. James's Hall, Piccadilly, when the following paper was read by Mr. Ellis Marsland, hon. secretary, British Fire Prevention Committee:—

### Recent Conflagrations and their Lessons to Architects.

In selecting this subject for our consideration to-night, I feel I shall be met by the covert observation that it is not to the interest of architects that the burning of buildings should cease; but, on reflection, I think we must all look upon fires as calamities if possible to be avoided, especially as they are sometimes attended by loss of life, and, from an economic point of view, a waste to be deprecated, and any suggestions for their limitation and control well worthy the consideration of professional and practical men.

I have selected for comment to-night two conflagrations. A continental one at Antwerp, and the other the more recent Barbican fire.

The first of these is the fire which destroyed the Entrepôt Royal, or the Government bonded warehouses at Antwerp, on June 5, 1901.

A few notes of the building, its size, position and contents may assist us to realise the magnitude of the conflagration.

The warehouses consisted of a series of buildings in three main blocks, each six storeys in height, fronting the Quai de l'Entrepôt, and designated the North Central and South Block, and connected in the rear towards the Avenue du Commerce by buildings of lesser height; there were, in addition, a number of one-storey buildings. The buildings dated from 1830, and were erected with brick walls treated architecturally with stone, but with no claim to be of fire-



resisting construction. The floors were principally of wooden joists carried upon wrought-iron girders and supported by cast-iron columns. The floors were carried on columns independently of the walls, but the ends of the wrought-iron girders were let into the walls and connected on the outside by plates and washers. This accounts to a large extent for the so complete destruction of the buildings, inasmuch as the falling of the floors and ironwork dragged the walls over and brought about the total wreck.

There were cross walls dividing the buildings up into sections, but these terminated below the roof, had many openings in them imperfectly closed with badly-fitting single iron doors, and in some cases with none at all. The staircases were of wood.

The buildings were used principally for the storing of bonded goods, such as coffee, sugar, wool, tobacco, tallow, hardware and fabrics, but some of the floors were let to private tenants, and it was in one of these tenancies the fire commenced. The exact spot was on the top floor about 24 metres from the ground, and it spread along the roof in either direction.

The whole of these buildings, practically all communicating and adjoining and filled with most inflammable materials, were little calculated to resist the spread of fire, and in addition to this, the fire starting in the roof storey, the extinguishing appliances were unable, through want of water-pressure in the hydrants and the want of more powerful engines, to touch the fire until it reached the lower storeys.

The fire occurred, as before mentioned, on June 5, at 2.30 P.M.; the brigade were called at 2.40 P.M., and at 4.30 P.M. the buildings of the central and south blocks were well alight, and by 6 P.M. the whole of the roofs and floors had fallen and were a burning ruin, which was not extinguished for many days after. The only portion saved was the north block. The northerly breeze which was blowing assisted the efforts of the brigade in preventing the flames leaping across the courtyard, although in the other direction it greatly assisted in the spread of the fire.

I think the moral of this fire is, Do not put all your eggs into one basket, but divide up your buildings into sections by division walls, and if you have openings see that they are closed by efficient double iron doors; also if you have a building 24 metres high see that your fire appliances will reach a fire in the top storey.

To business men a fire is always a calamity to be guarded against, and although one may be insured against the loss of premises, stock and rent, yet the inconvenience caused to and the dislocation of one's business is to be deplored and avoided if it be possible.

In these buildings not one I think had any pretensions to be fire-resisting, and their total destruction under the circumstances is small matter for wonder, nor is the architect entirely to blame.

If he suggest to his client fire-resisting construction, he is met by some or all of the following objections:—

1. Why should I build my premises of fire-resisting material if the insurance companies will make no difference in the amount of premium between a fire-resisting building and a combustible one?

2. Why should I build to resist fire if my neighbour is not compelled to do the same, and his building igniting sets fire to mine?

3. Why should I build to resist fire if by reason of the increased cost of my building my assessment is increased?

These are all, of course, very pertinent objections, and with regard to the first, the insurance companies not being philanthropic institutions, but existing for profit, do not as yet see their way to make any material reduction, as in a large conflagration the result more often is the complete destruction of both classes of building. The fire spreads through the windows, either those fronting the streets or those looking into the light courts. Does not this suggest that all these openings should be protected by iron or hard wood shutters, or by asbestos blinds, and that all these should be closed every night at the conclusion of business as a matter of ordinary routine? I do not, of course, say that this method would prevent the spread of fire entirely, but it would retard its progress so as to enable the fire brigade to surround a fire instead of having to go in all directions, following outbreak after outbreak, by reason of the fire travelling through window openings. We are sometimes tempted to be dissatisfied with our fire appliances, but given a good stiff breeze, as happened on the occasion of the Barbican fire, how are you going to cope with fires breaking out in all directions and on all floors at once by reason of the glass in the window openings giving way and carrying the flames through? Look at New Zealand Avenue with its *cul de sac* and large area of opening; the fireman has not half a chance, and the wonder is not that the fire was so large, but that it was confined to such comparatively small limits through the indomitable perseverance of the brigade.

If, as I suggest, insurance companies could be persuaded

to countenance this form of protection and reduce their premiums to those clients who adopted them, it would be, I think, to their advantage, or there might be legislation on this head making this form of protection compulsory. Objection has been urged that if premises are so straightly shut up it would perhaps be difficult to detect a fire in its incipient stage, but it is then your automatic alarms and sprinklers would come in. We have also in lieu of shutters a recent invention in the form of wired glass, with which the windows could be glazed into metal or hard wood frames or directly into stonework or brickwork.

The second objection could of course only be dealt with by legislation, and if this were desirable certain sections or zones of a city which are devoted to buildings of the warehouse class might be compelled to be of fire-resisting construction, and rules framed for such, penalties also being levied against those who by their indifference or carelessness endanger their neighbour's property.

In Germany, I understand, a man is made personally liable if it is found after a fire he has neglected any of the precautions against it he is bound by law to take. Without, perhaps, going quite so far as this, a man, for instance, who neglects to see that any opening in which fire-resisting doors are fixed is not closed every night at the conclusion of the day's work might be liable to a penalty. At present the law provides for doors in a party wall under certain circumstances, but does not provide for them to be closed when the premises are vacated, thus in many cases rendering them inefficacious. Neglecting to provide proper exits in case of fire might also be the subject of personal responsibility, as it would conduce to greater caution on the owner's part if he were made personally responsible for the safe exit of his employees in case of fire.

The third objection is one which is of great importance, and it appears to me that if a building owner, by reason of additional expense, renders his building fire-resisting, he renders a service to the community, and should in consequence have his assessment reduced instead of increased. If municipalities would only look at this point in the right light they would see that a citizen who aims at fire resistance in his building is a public benefactor, as he tends to reduce the precautions which are now necessary to be taken by the municipality to protect the community from fire and loss, and thus save expenditure, and this is a point in the incidence of taxation well worthy the attention of corporations.

The fire started either in Nos. 8 and 9 or 10 and 11, Barbican, and spread to the right and left; then the flames were carried, by the stiff breeze that was blowing, across the road to New Zealand Avenue, a *cul de sac*, along which it spread on either side until it was stopped by the wall at the end enclosing the low building of the horse repository.

The call was given at 10.41 P.M. on April 21, 1902, and the stop at 12.45 A.M. the next day.

As the result of this fire, I should like to make the following suggestions for buildings of the city warehouse class:—

That all supporting piers should be constructed, where practical, of brick.

That all roofs should be flat and of fire-resisting construction.

That all windows should be protected by fire-resisting shutters or wired-glass.

That all floors should be fire-resisting, and all iron girders, columns and supports be protected by special plaster or hollow tile covering and not tied into walls.

That all staircases be enclosed by at least a 9-inch wall carried up to the roof, and any openings on to the same be filled with fire-resisting doors.

That all lifts be enclosed with at least a 9-inch wall and carried up through the roof and covered with a skylight of light iron and glass, and all openings on to the several floors be filled with fire-resisting doors.

I feel assured that if the above-mentioned precautions were taken, coupled with the promptitude with which the fire brigade arrives on the scene, a fire would be confined to the building in which it originated, and a large amount of loss and inconvenience averted.

#### SOCIETY OF ENGINEERS.

THE forty-eighth annual general meeting of the Society of Engineers was held on Monday, December 8, at the Institution of Mechanical Engineers, Storey's Gate, Westminster, by kind permission of the President and Council of the Institution.

The chair was occupied by Mr. Percy Griffith, president. The following gentlemen were duly elected by ballot, as the Council and officers for 1903, viz.:—As president, Mr. James Patten Barber; as vice-presidents, Messrs. David Butler, Nicholas James West and Maurice Wilson; as ordinary members of Council, Messrs. Joseph Bernays, George Austin Pryce Cuxson, George Abraham Goodwin, William



Henry Holtum, Richard St. George Moore, Henry Sherley-Price, Joseph William Wilson, and Edward John Silcock; as hon. secretary and treasurer, Mr. George Burt; as hon. auditor, Mr. Samuel Wood, F.C.A.

During the scrutiny the President addressed the meeting, bringing before the members the salient points of the work of the past year. He referred to and commented upon the papers which had been read, and announced that the following premiums had been awarded by the Council for papers read during the past session, viz.:—The President's Gold Medal to Mr. Thomas Andrews, F.R.S., for his paper on "The Effect of Segregation on the Strength of Steel Rails;" the Bessemer premium of books to Mr. Augustus R. Galbraith for his paper on "The Hennebique System of Ferro-Concrete Construction;" a Society's premium of books to Mr. Benjamin H. Thwaite for his paper on "British v. American Patent Law Practice and Engineering Invention;" and a Society's premium of books to Mr. Brierley D. Healey for his paper on "Recent Blast Furnace Practice."

The President also alluded to the visits which had been made to works of professional interest during the year. These were:—On June 11, to the pumping stations and works connected with the water system of the Crystal Palace and the new roof over the centre transept. On July 16, to the works of the new docks at Southampton, in course of construction, and to the Southampton waterworks, and on September 24 to the works of Jos. Baker & Sons, Ltd., manufacturers of industrial machinery and appliances, and to the machine works of the Wicks rotary type-casting company, both of which are situate at Willesden Junction.

A vote of thanks was accorded to the scrutineers, and the proceedings terminated by a vote of thanks to the President, Council and officers for 1902, which was duly acknowledged.

After the meeting a reception was held by the President and Mrs. Percy Griffith, followed by a social reunion, at which an excellent programme of vocal and instrumental music was carried out under the direction of Miss Gertrude Kemp. During the evening an interesting lecture illustrated by lantern views was given in the lecture hall by Mr. Frederick Lambert, F.R.G.S., entitled "The Crystal Caves of New South Wales, Stalactite Marvels of the Subterranean World." There was a large attendance of members and visitors, and the function, which was the first of the kind held by this Society for many years, was highly successful in every respect.

### TESSERÆ.

#### Jacob Moor and Roman Gardens.

THE Scottish landscapist, who was influential with Prince Borghese, was born in Edinburgh in 1740. He studied art with Runciman. About 1773 he went to Rome. The Prince Borghese became one of his patrons, and under Moor's direction determined to remodel the ground adjoining his incomparable villa on the Pincian hill. The gardens of the Medici and Albani villas, and those called Boboli, near the Grand Duke's palace at Florence, are laid out in a stiff taste, with walls of evergreens, straight alleys, marble fountains and crowds of statues. This style, then obsolete in England, is best adapted to Italy, where a constant and strong sun would soon destroy velvet laws, and the broad shade in a street of clipped trees or covert walks is more coincident with the idea of local luxury. There perfectly harmonising landscapes are found only in imagination and on canvas, for the art of reducing a district of country to the rules of picturesque beauty practised in England is unknown. Moor gave the first specimen of an English garden to the Roman artists, as described in Mason's elegant didactic poem so denominated. The alleys and terraces disappearing, the fountains no longer are forced into the air, and the water, liberated from marble chests, spreads into a lake with irregular shores. Upon a small island in this garden is the temple containing a fine statue of Æsculapius, and another exquisite morceau of architecture sacred to Diana, in an appropriate situation, each of most correct imitation. Other parts of these ornamented fields exhibit the Roman scenes of old. A hippodrome, a villa invariably corresponding with the plan and scale given by Pliny and Vitruvius, and a museum destined to receive the statues found in the city of Gabii, realise the idea of a classic pleasure ground. Moor was not neglectful of his painting. He imitated Claude successfully, and his work was admired by Goethe. He painted his own portrait, in which he represented himself with his coat taken off and lying by him, and as resting under a spreading tree in a forest. He died in Rome in 1793.

#### The "Carved Room," Petworth.

This is a magnificent apartment, 60 feet long, 24 wide and 20 high, and derives its name from its being profusely adorned with the carvings of Grinling Gibbons. The room is probably unmatched for its carved work in the world, and no one who

has not seen it can form a conception of the exuberant fancy and exquisite skill of that prince of woodcarvers; and once seen, it can never be forgotten. Festoons of flowers, fruits, shells, birds, foliage in every variety and play of line, with vases graceful as Grecian artists ever moulded, are suspended from the walls and ceilings in endless combinations. There is a painful interest attached to one of the finest of these festoons, inasmuch as Gibbons's favourite pupil, Selden, lost his life in rescuing it from a fire which occurred here while the work was in progress. The fertility of Gibbons's fancy is amazing. Gilpin lamented that Gibbons was not born in an age of Gothic architecture; and all who look on his works will feel that his marvellous wildness of invention could only in such an age have had full scope. It must be admitted that his luxuriant foliage and endless diversities of form appear a little incongruous within the stiff walls of a classic room. Other rooms at Petworth are also adorned with his carvings; and altogether the collection of them far surpasses any other in England. We ought to mention that another artist was afterwards occupied in fitting up every portion unoccupied with the works of Gibbons, that is suitable to be so adorned, with carvings; and his productions are very beautiful and admirably executed, though they do not approach those of Gibbons in originality or fertility of invention or richness of fancy.

#### Deceptions in Mediæval Castles.

The devices employed in the construction of castles in order to deceive and mislead an enemy are worthy of notice. There are arches and portals to be seen which have the appearance of being ancient entrances filled up; but that such were merely to deceive may be known by finding their exact relative situation with the interior, when it will be seen that these false entrances were not only against the solid side walls, but were frequently placed against the end of an outside wall, or against the end of a transverse division wall, so that these seemingly weak parts were, in fact, the strongest parts of the structure, and any attempt at making a breach through them would be labour in vain. There were also small towers placed in one or two situations which had the appearance of being erected to strengthen weak parts of the building, and these towers themselves had the appearance from without of being weak, from the notion that they contained apartments (which supposition was strengthened by their having loopholes), and therefore easy parts to be battered down. But that these erections were merely to deceive is evident, because they were not only placed at the strongest parts of the building, but they consisted of one solid mass from the bottom to the top, with the exception of a small but strong arch on each floor above the ground floor which led to the loopholes, and their walls were frequently 20 or 30 feet in thickness. The small tower, also, which contains the vestibule was most substantially built, notwithstanding its affected appearance of weakness. The foundations were exceedingly massive and strong, and although weapons might be thrown in at the windows of the vestibule they could do no great injury to this side of the principal tower. Even in the event of the smaller tower being battered down, which would have been by no means an easy task to accomplish, this side of the main tower presented a more substantial front to the enemy than any of the other sides from the absence of openings on the first floor.

#### Buddhism and Indian Architecture.

According to Fergusson there are no monumental traces whatever of the earliest known inhabitants of India, the Tamul race, that still occupies the southern part of the peninsula and forms the substratum throughout of the various existing populations. They were either not a building people, or the materials they used were of so perishable a nature that there are no remains of their architecture. Nor were the tribes of the so-called Indo-Germanic stock, which descended into the Indian plains from the West at a very remote age, originally a building race. The architectural history of India only commences when Buddhism finally triumphed over the old Brahminical faith and became the state religion. This took place in the reign of Asoka, the grandson of Chandragupta, the Sandrocottus of the Greeks, or about 250 B.C. "Not one building nor one sculptured stone has yet been found in the length and breadth of the land which can be proved to date before his accession—an important fact, because at this time the Græco-Bactrian kingdom was still flourishing, and, as we know from coins and other remains, some forms of Greek art, however corrupt, were still preserved and their influence felt in Central Asia to the borders of Hindostan." How far was Indian art, especially architecture, affected by this Greek spirit? The materials are still wanting, and perhaps may never be obtained, to furnish a satisfactory answer, but there is sufficient evidence to prove that that influence had penetrated into India. The oldest monuments hitherto discovered are the Lâts or monolithic pillars, set up, according to the inscriptions upon them, by Asoka himself. One of the best known is that now standing in the fort of Allahabad. Its capital is wanting,



but on the shaft is an ornamental band, so entirely identical with the Greek form of the Assyrian honeysuckle ornament, that its origin cannot for one moment be doubted. A Lât on the Gunduk still preserves its capital, which is purely Persepolitan, thus showing a double artistic influence from Greece and Persia, such as might have been anticipated from geographical considerations. Many of the circular domical topes raised over Buddhist relics may be assigned to the same period as the Lâts. None are of earlier date, most of them are much more recent. They are generally without any well-defined architectural forms and ornaments. Some between the Indus and the Jelum have been found to contain Greek and even Roman coins, and one to the west of the Indus, near Peshawur, is distinguished by barbarous Corinthian pilasters. All these facts point to a connection between West and the East which must have influenced the arts of the country beyond the Indus.

#### Da Vinci and the Venetian School.

According to what is related by Vasari, it was from seeing some works of Da Vinci that Giorgione adopted that mellow, forcible, deep-toned manner of colouring from which he himself, and afterwards Titian and the whole Venetian school derived so much glory. Many particulars which might, if necessary, have corroborated this fact were, no doubt, easily traceable in the time of Vasari. The native writers of the history of Venetian art have sedulously and ungratefully avoided any mention of their obligation to Leonardo. The pictures of Giorgione being mostly painted for private people, are at present, unfortunately, no less difficult to be found than those of the latter time of Da Vinci. There is at Venice but one undoubted, undisputed picture of Giorgione in oil. This picture, which is at the Scuola de' Sartori, is very well preserved; it is composed of half figures of the Madonna and Bambino, San Joseph, Santa Barbara, &c. It is in many parts ill drawn, and from the subject and disposition of it affords but little opportunity for those peculiar excellences which distinguished Giorgione. But notwithstanding, there is enough to account for the very extraordinary admiration in which he was held. The warm, tender glow which is diffused over his carnations, the breadth, force and transparency of his shadows—their happy accord with each other and with the lights and middle tints—and the majestic dusky hues of his secondary lights are, indeed, of the most exquisite relish, and had left nothing further to be wished for but the extension of the same intelligent, happy conduct to the larger and more interesting compositions which soon followed in the works of his disciples and imitators. The few pictures which remain of Fra Sebastiano at Venice are, for rilievo, richness, depth and majesty of hue very Giorgionesque, but it is in the most valued and precious works of Titian that we find this style at the highest.

#### Architectural Effect.

Effect in architecture may be considered under a certain abstract, but at the same time material, sense, as an assemblage of projections and hollow spaces, or smooth and rugged surfaces, which contain materials for more than one kind of contrast, and consequently include combinations capable of producing more than one species of effect. Contrasts of light and shade spring from these varied combinations and aid in producing effect, and it is certain that a uniform mass of even surfaces without hollow or projection could produce no other impression than that of monotony, which is the same thing as want of effect. A mass presenting one smooth unvaried surface, however imposing it may be from its size, is incapable of producing more than one kind of idea in the mind; and thus, after the first general impression has been given, the sight of it, exciting only repetitions of the same idea, becomes wearisome from its monotony. The Egyptian pyramids are grand from their size, but nothing can be imagined more wearisome than for an architect to be condemned to view a pyramid constantly from one point of view. No new ideas would arise in his mind, and no new combinations of forms would suggest themselves, and he might as profitably, in an architectural point of view, gaze on the barren sands of the desert, or the calm surface of the Dead Sea. Very different would be the mental position of the same individual living opposite to the façade of the Louvre, the colonnade of St. Peter's, or the peristyle of the Pantheon. He could every day receive new impressions, and could with difficulty exhaust the store of combinations to which the effect of these works would give rise. The effect that depends on composition is that which results from the varied use of what are called hollows and projections in an edifice. These must, of course, be in a great measure regulated by the variety and harmonious combinations of the lines of the plan, but it is the masses forming the elevation that produce the effect, and which, by multiplying the points of sight, multiply also the impressions transmitted from the eye to the mind, and thus give rise to new combinations of ideas. It is by this variety of aspect that an edifice becomes a sort of theatre, the scenes of which appear to change, either according to the different points of

sight from which it is contemplated, or to the varied disposition of the light which falls differently upon the various hollows and projections of the edifice at different periods of the day.

#### Da Vinci's Manuscripts.

The history of the dispersion of the drawings and manuscripts of Leonardo da Vinci has been narrated by Mazenta. Leonardo, dying at the château of St. Cloux, at Amboise, bequeathed them to his favourite pupil, Francesco Melzo, evidently with the desire that his writings should be edited and published. Melzo seems to have commenced the task by the compilation from the various books of the "Trattato della Pittura," but he did not publish it. Indeed, it remained in manuscript till Poussin, seeing its value, designed illustrations for it, and persuaded Raphael Trichet du Fresne to give it to the world, which was done in 1651. Needless to say, there have been many editions in various languages since that time. The most valuable has hitherto been an edition printed at Rome, from a manuscript in the library of the Vatican, in the year 1817, and edited by the Abbate Manzi. Several years ago there was published a fresh edition of the Vatican codex, edited by Herr Ludwig. It forms the last three volumes of Professor Von Edelberg's "Quellenschriften für Kunstgeschichte." A valuable contribution to the literature of the subject is "Das Malerbuch des Leonardo da Vinci," by Dr. Max Jordan, director of the Berlin National Gallery. To return to Melzo, whom Vasari styles a handsome and amiable old man. He outlived his master probably half a century, but seems to have been sadly remiss in fulfilling his duties as literary executor; neither did he take proper steps to maintain intact his precious legacy after his own decease. The manuscripts and drawings were then held to be of extraordinary value; the cupidity of collectors was excited, and very shortly their dispersion commenced. Then for more than two centuries they were regarded as objects of rarity, and eagerly sought after by *virtuosi*; Arconati was offered more than 2,000*l* by Charles I. for some volumes in his possession. To master their contents, however, was the last thing thought of, precisely as many a modern bibliophile never reads a page of his *incunabula*. The painter Louis Antoine David was the first person who seems to have seriously set about the study of Leonardo's writings. He relates how he esteemed himself fortunate if, after four hours' study, he was able to decipher a page of the manuscript. His labours, however, did not result in publication, and it was not till 1797 that any really valuable account of Leonardo's scientific studies appeared in print. It is to J. B. Venturi, an Italian professor, settled at Paris, we are indebted for the first insight into these hitherto unexplored documents. The title of Venturi's work is "Essai sur les ouvrages physico-mathématiques de Léonard de Vinci, avec des fragmens tirés de ses manuscrits apportés de l'Italie, &c. Paris, 1797." It still remains one of the most useful aids to the study of Leonardo. Being now very scarce a reprint would be a boon for which students would be grateful. Since Venturi's essay there has been a continuous series of works illustrating various phases of Leonardo's activity, of which Amoretti's "Memorie Storiche" and Bossi's "Cenacolo" may be cited with approval. To enumerate the various lives, monographs and treatises would take up considerable space, for the literature of Leonardo fills a goodly library shelf.

#### Poussin and Jan Steen.

Culture, though it cannot supply the place of genius, will arm the possessor with something which will at all events prove a satisfactory practical substitute for it. Two instances can be selected from the history of painting. The name of Nicholas Poussin stands high in the estimation of the world, and his pictures are found in every public gallery in Europe. Now had he not possessed his marvellous culture and as its result his philosophical breadth of mind, it is a great question whether the purely artistic gifts with which he was endowed by nature would have sufficed to make his name known at all. It is also probable that had he chosen to express himself with the pen instead of the brush his imagination, his knowledge and research would have enabled him to delight men's minds with a lively representation of the whole atmosphere of thought in which the ancients lived, and of the imagery which moulded and adorned their speech. On the other hand, if Jan Steen had devoted himself to literature instead of to painting we cannot imagine him, though his was evidently a powerful mind, to have enriched the world with anything more valuable than a tavern song, and it would have been incomparably the poorer for the loss of his pictures. He was great by force of his genius only, the other was great by force of his culture in default of genius.

The Government Factory at Sèvres will reproduce several statuettes from models by the late Jules Dalou. The profits will be applied to the "Orphelinat des Arts."



## NOTES AND COMMENTS.

WHEN commenting in our number of March 14 on the case *BICKMORE v. DIMMER*, in which it was claimed that the erection of a large clock, 4 feet diameter, outside premises in Liverpool, was an alteration, and in consequence a mandatory injunction for its removal was sought, we ventured to express our dissent from Mr. Justice FARWELL'S decision. His lordship held that there had been a breach of the covenant not to make any alteration to the premises without the lessor's consent, and he granted the mandatory injunction. The defendant appealed. We then said:—"To the majority of people it will appear an advantage for lessors to have similar alterations made without cost to them, for if the premises had gained a reputation for clocks and watches the big clock would be enduring evidence that the business was carried on, although the premises had fallen into the hands of a different lessee." The appeal was heard on the 4th inst. The lease had a clause to the effect that the lessee would not make or suffer to be made any alteration to the premises except as therein expressly provided without the previous consent in writing of the lessors. Lord Justice VAUGHAN WILLIAMS said it would be impossible to hold that every addition to the premises was within the meaning of the covenant. In such a case a tenant would not be able to put up an exterior blind, a lamp, or a knocker. His lordship thought that the words "alteration to the demised premises" could only be applicable to alterations affecting the form or structure of the building. Lord Justice STIRLING considered the clock to be a reasonable and proper mode of announcing the business carried on. Lord Justice COZENS HARDY held that there must be some alteration to the words. It might be supposed that the papering of a room, or the introduction of a gas bracket or electric bells, was impossible. The clock could not be claimed to affect the form or structure of the building. The appeal was therefore allowed. As a rule, actions are taken for the removal of fixtures. In this instance an attempt was made to prevent the addition of a valuable fixture. It should be remembered that the lessee holds a lease of which about nineteen years are unexpired, and if he succeeded as a watchmaker and jeweller the lessors would afterwards reap an advantage from the clock, which would have become an established sign. And here it may be noted that while in England the clock or any similar announcement would become the property of the landlord, in France any sign or announcement such as the clock remains the property of the tenant who fixed it, and he can remove it with him in order that no succeeding tenant can obtain any benefit from it to the other's disadvantage.

MANY efforts have been made to deal with the onerous problem of housing the poor of Glasgow. Much has been done, but it cannot be said that a solution has been obtained. The subject is being investigated by a municipal commission consisting of sixteen members, nine of whom belong to the Corporation and the rest ordinary citizens. The evidence of the first witness, Mr. HENRY, the city assessor, suggests the magnitude of the problem. In Scotland, it is well to remember, a house may be one of very numerous rooms in a building, and according to the assessor the unoccupied houses at 6% and under had decreased 51 per cent. during the past eleven years, while for the same period the unoccupied houses at rents above 6% and under 10% had increased 75 per cent., and the unoccupied houses at 10% to 15% inclusive had increased 404 per cent. The population of the city in 1891 was 656,185, compared with 776,967 in 1902. In 1891 there were 33,446 houses of one apartment, against 36,422 in 1902; 59,768 of two apartments, against 72,099; and of three apartments 22,611, compared with 27,695; and of four apartments and upwards 19,057, against 24,630. At first sight the figures might be taken as evidence of sanitary improvement. A single room is insufficient in cases where there is a family, and it might easily be concluded that sacrifices were made in order to possess two or more rooms. Unfortunately there are still people who cannot afford to rent more than

one room, and they are increasing to a larger extent than the single-room dwellings. The Corporation of Glasgow have erected houses of a single apartment, but from a division introduced in each of them they become practically two-roomed houses. Private proprietors no longer desire to invest their money in building houses that can be let at 5% a year. As there is little increase in number, the rents of single-roomed houses have advanced 14 per cent. during the last eleven years, while with two-roomed houses the rise was 6½ per cent. The tenants who are satisfied with a single room are not always desirable. The only remedy Mr. HENRY could suggest was for the Corporation to utilise available ground within or without the city to provide accommodation, and if the dwellings were outside the city then the tenants should have free passes to travel by tramway cars, or in the rent an allowance for fares should be included.

THE late JOHN HUNGERFORD POLLEN, who died at Bayswater on the 2nd inst., was so long associated with South Kensington it was excusable to imagine that he was an ordinary official who had passed through many grades until he became editor of the Museum Handbooks, and author of some of them. But prior to becoming one of HENRY COLE'S lieutenants he led a life not without interest. The son of a baronet and born in 1820, he studied in Oxford and was elected a Fellow of Merton. In course of time he was appointed bursar of his college, and was Senior Proctor. He possessed skill as an amateur and decorated the college chapel. It is also said that he co-operated in the paintings for the Union. Being a clergyman he became vicar of St. Saviour's, Leeds. Faithful to his convictions he left the Church of England, and when Dr. NEWMAN was appointed head of the Catholic University in Ireland and was allowed to organise a staff of professors, Mr. POLLEN was made Lecturer on Art. It was the first time such an office was created in an academical institution in this country. His knowledge was tested in a remarkable way. There was a lecturer on architecture, but he was supposed to have been faithful to the Gothic style. Dr. NEWMAN wished to have a University chapel erected at his own expense; he was therefore justified in preferring a style which seemed to him to be symbolic, and he selected the Basilican. The building was carried out for him under Mr. POLLEN'S direction. There were divisions which were believed to correspond with those in the early churches, and to be used by people not fully initiated into the doctrines of Christianity; but no such use of them was made in Dublin. One of the peculiarities of the building was the extent to which the coloured marbles of Ireland were utilised in large slabs to line the walls. The upper part was hung with copies of the tapestries in the Vatican for which RAPHAEL prepared designs. There was gilded latticework in the galleries, and the interior thus produced colour effects unusual in churches in the fifties. In the *Atlantis*, which was the official magazine of the University, Mr. POLLEN gave an account of the basilica. The withdrawal of Dr. NEWMAN from Dublin was followed by Mr. POLLEN'S resignation. Subsequently he accepted an appointment at South Kensington, and there his wide knowledge was turned to account with much advantage to the administration.

## ILLUSTRATIONS.

NEW PREMISES, HANOVER SQUARE, W.

NEW MANSIONS, HENRIETTA STREET, W.

BOARD SCHOOL, CASSLAND ROAD, HACKNEY

HOUSE AT EGHAM.

CATHEDRAL SERIES: HEREFORD. BALL FLOWER ORNAMENT ON TOMB IN NORTH-EAST TRANSEPT. FOUR-LEAVED FLOWER ORNAMENT ON TOMB IN NORTH CHORCH AISLE



## THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Association was held on Friday evening last, Mr. L. Ambler, vice-president, in the chair.

The following were elected as members:—Messrs. L. J. Prestwich, E. N. Trounson, K. Gammell, G. Seward Turner, T. S. Inglis, G. T. Hine, F. W. Pomeroy, T. Raffles Davison and J. S. Gibson.

Messrs L. Solomon and Herbert Hooper were reinstated members.

Mr. J. S. GIBSON read the following paper on

## Architectural Practice, Real and Ideal.

He said:—This subject does not need any introduction to this audience; it is perhaps too closely connected with us all to be appreciated at its proper value. The things of our everyday life are apt to get a little out of perspective, and an attempt to put them into their real relation to the other parts of our environment may be of some use.

Architectural practice of some sort is always with us, and as a rule we take it as a matter of course, like the rising of the sun, and hardly question its rightness or wrongness, its fitness or unfitness for our time. In so far as we think on any important subjects, we are influenced by two impulses, one to accept things as we find them, and the other to inquire into them and discover if possible the reason of their being.

A healthy curiosity into the abstract question of architectural practice is a desirable thing, but I am afraid few would so consider it if applied to the mysteries of any individual practice; so in this brief essay on the subject we will try not to offend any honest fellow-architect.

It has always appeared to me as very peculiar that the pupil who passes three years in his master's office and, say, another five or six years as assistant, should rarely hear a word on the all-important matter of how to begin and carry on the practice of his profession. Considerable time and labour on the part of the master are often devoted to make him an efficient draughtsman, to give him a workmanlike grasp of construction, to instil within him a knowledge of the simpler methods of planning, and to awaken an appreciation of the great achievements in design, while no attention is given to the more intimate relations between parties, common to all practices. Some men I know have been exceedingly kind to their former assistants, and have greatly helped them with advice when they have had to deal with a difficult question, but this is usually after they have commenced practice on their own account; but, for the life of me, I cannot see why the experience necessary to deal with many of these difficulties should not be gained in their master's office. There are a thousand and one questions involved in our relations with contractors, public bodies, fellow architects and clients that might very profitably be discussed in the presence of our assistants, and in which they might take part.

Let us now give a few moments to the consideration of the time antecedent to practice, the pupil and assistantship period, if I may so designate it. This must be a period of enthusiasm for the work, the glamour and poetry that the spirit of youth alone can impart must be pre-eminent. Compared with the sculptor or the painter you must have more enthusiasm, for their handiwork is the realisation of their ideals, while yours has to be carried out by other hands before it can be judged or appreciated, and at this early stage the chance of this being done is still remote.

The architect's early training is also a much more arduous and complicated one, and I do not think we can reasonably expect to do with less than six or eight years of really hard and earnest labour; but at the end of that period we ought to have such a grasp of our work as will enable us to deal successfully with the problems given us to solve. During the second half of this initial stage a considerable amount of measured work from good examples, irrespective of styles, should be done, together with sketches which get as near as possible to the heart of the design and leave the art of merely pretty drawing severely alone. A good motto for this period might be "Draw often and accurately." The mind should be in a receptive condition, so that each new experience should find soil in which to take root and room to grow.

The world has grown so tiny now that visits to the various architectural centres of Europe may be easily accomplished at this period and the beneficial effects of the study of the old masterpieces of architecture is invaluable. We have now arrived at the stage at which the man has spent energy, time and money in acquiring the facility to plan and design, his mind directed into the right channels likely to lead to the development of his most cherished art, and he is confronted with the necessity of using this experience as a means of earning his livelihood. By what methods can he make his capacities known to those desirous of building? In countries where the mass of the people know something of art and value its beneficial effect on everyday life—say in France—it is considered a part of the Government's duties to see that the most

meritorious and gifted students are rewarded by commissions to paint pictures, design buildings and execute sculptures on all occasions when public works of this kind are required; and I am glad to think they are often required in such countries. But we manage things differently on this side of the Channel; our Governments think their duty accomplished by making one of their partisans First Commissioner of Works, and this estimable gentleman usually dances to the tune piped by the permanent officials, whose sympathy with, and knowledge of, the arts are painfully evident by their works scattered throughout this long-suffering country. There are times—intermittent, it is true—when the political mind doubts the omniscience of the official mind, and the political mind boldly resolves to go outside the Government offices for the design of some important building. Until a few years ago it was the custom to throw these matters open to all competitors, and, as a rule, the result justified the action. But of late years these competitions have been restricted to the men whose experience extends over a considerable number of years, and so this avenue is now practically closed to the young architect. From the Government, then, the beginner need not look for any help to establish himself in practice. A man's personal friends, in the majority of cases, may perhaps be the means of giving him the first few chances that go to prove the stuff he is made of, and if there is any real good in his work it will bring more in its train. It is during this early period that many men compete for work of all kinds, and by so doing gain an experience in planning and design that is worth the labour and time expended, although they may bring no other reward. When we think of the fearful and wonderful arrangements in the planning of public buildings, and the more fearful architectural embellishments of these plans which were the painful results of early efforts, we cannot be too thankful that these things never got beyond the paper stage, and that an unappreciative assessor passed them by and thus saved us from having to live down an early indiscretion.

Competitions are not unmixed blessings to the profession, but we must admit that the buildings erected under this method compare favourably as a whole with the average of works erected without competition. I should certainly advise all men, for the first few years of their practice, to take part in well-conducted competitions, but be sure the conditions are fair, the assessor competent, and the subject one they know something about. And as soon as the state of their practice warrants it, I should also advise them to let competitions alone. There are many amusing and curious ways of obtaining a practice, and for all of us it is a serious question to determine how to start on our career. But it has to be settled at an early stage, or else it will effectually settle us. Some cut the Gordian knot by leaving the ranks and embarking into the maelstrom of "trade;" these are the wise but inartistic ones. Some rely on the artistic blindness of the general public, and run lucrative drawing manufactories on business-like lines. These are the shrewd and "practical" ones. Some have relatives who are something big in the City of Finance or Society, and these push their architectural appendages in the same manner as they do shares, or officers in the army. What Lord Melbourne said about the bestowal of the Order of the Garter, that "There's no damned merit about it," we may safely say in reference to the practice of these fortunate ones. Some drift into that refuge of mediocrity, an official appointment in a Government office, and in the Office of Works, or such-like departments, do what they can to spread the commonplace over the land; these can hardly be said to practise, either really or ideally. Some enter into competitions, throwing all their energies and skill therein, in the hope that merit will be rewarded. These are the sanguine ones, and sometimes they are not disappointed. Some enter into partnerships with clever men of business, who "manage" the clients while they manage the office. These are the timid ones—likeable fellows who think the chief end of life is to get a cornice perfectly proportioned or a skirting-board properly moulded. Some attach themselves to the land and, backed by financiers, erect enormous piles of vulgarly commonplace type, whose chief quality is bulk, and whose erection in some slight degree justifies the short leasehold system of land tenure. These are the wily ones. Some develop an absorbing interest in rights of light and devote precious time to the intricacies of party structures, and then pass away full of years and riches. These are the canny ones. Some renounce art and become crafty, finding that the public will pay more willingly for the abnormal than the artistic. These denounce style, balance, composition, rhythm, grace, and are sharp-sighted leaders of the blind. Some determine to live for art's sake, and usually die for it instead. These are the foolish and artistic ones. These are but a few of the thousand and one ways of practising our profession, and each of you must one day settle this great question for yourself.

Turning to the realities of practice, one may say, "Happy is the man who knows nothing of them;" for the whims and vagaries of the client are sometimes as difficult to deal with as



the prejudices of the architect. Among the first troubles to assail you are the reconciliation of the wants of the client with the amount of money he is willing to spend. In this matter it is well to show as kindly as possible the impracticability of expecting 5,000% worth of accommodation for 3,000% cash. Never estimate your buildings too low; it will prove easier to have a margin to meet the changing views of your client rather than a deficit to ask him to wipe off. Having satisfactorily settled the money question you can, with a merry heart, set about the designing of your house, and if your client expresses a strong preference for any unusual disposition of rooms you must give this your best consideration, for after all he is the person who is to live in them. If you have hit on any particularly good arrangement do not throw it at the good man, but lead him gently to it and thereby gain his approval, for this is more often won by strategy than by force. Always be ready with examples of similar cases, and if these are already known to your client so much the better, for then he feels on safer ground; all clients prefer experience to experiment.

When discussing any question never imagine that force of language will atone for lack of reason. You will often find your client expressing his views on the architectural styles, and if he desires you to design him a house which shall be Palladian Renaissance outside and English Gothic inside, do not regard him so much as a lunatic as one who requires careful treatment, as his appetite for styles may be omnivorous. Having matured your design and written your specification, do not think that your worries are ended. Under the present system of competitive tendering for work you may find yourself face to face with a builder who solemnly assures you that Smith's blue lias lime is much stronger and better than Brown's Portland cement, that drain pipes are best jointed with clay, and that footings should rest on the solid earth without the intervention of any concrete under them. Should you meet such a man, no doubt you will inform him of your good old crusted prejudices, and stick to the specification. Having taken a firm stand in your dealings with a builder of this kind, maintain this attitude to the end, and you will generally succeed in getting a creditable job for your client, although at some trouble to yourself. But we must not forget that we are paid for the trouble involved in getting our buildings properly erected, as well as for designing them.

One of the surprises of practices in their early stages is the extraordinarily easy manner in which variations can be made on contracts during execution, so that when the accounts come in they often surprise the architect more than any other person. The apparently innocent suggestion to "omit the moulded beam and side brackets" over an opening, and just "put in a couple of semicircular arches with a column and two pilasters," has, in some mysterious way, been expanded into about five pages of a bill of extras, the total of which makes the architect gasp. The one safe rule in all these matters is to make a drawing and get a price fixed before any work is done. If, however, you have made the variation without a price being previously fixed, you may rely upon one friend in your extremity, the quantity surveyor. He is the man who can pull you through. How he does it I do not pretend to know: perhaps he has no bowels of compassion as far as builders are concerned; perhaps there is some freemasonry of which you and I are ignorant, but, at any rate, he will usually succeed in making a bill more palatable to your client and yourself, and we cannot be too grateful to him for these services.

In your dealings with your client, as with your builder, make up your mind on the matter in hand, and never depart from your determination. Do not be so foolish as to expect to get your own way always; you will be a lucky man if you get it occasionally, but if you show signs of indecision of character, depend upon it you will never get it at all. Should your client upon any vital matter prefer his way to yours, let him clearly know that the responsibility for success or failure rests on him.

If your work be at a distance, and frequent visits are impracticable, do not be surprised at the variations the builder will quite innocently make on your designs. Some of the most charming results are often thus accidentally obtained. Years ago a fellow-architect said to me, "It's a poor design that does not admit of improvement in execution," and the ripening experience of the translation of drawings into solids will suggest the variations that are improvements. Do not worry too much about the finish of your drawings. The work itself is the heart of the matter, and above all things, do not over-elaborate the details of your buildings. A multiplicity of detail does not insure a fineness of quality, and I had rather see one good architrave round every door of a house than an abundant variety of commonplace sections. You may dash off sketches of façades and interiors; many of the happiest inspirations are the most evanescent, but as you grow older you will find it harder to let your full sizes go out of the office. These are the final stages in your part of the work, and by them you will be, in a great measure, judged.

The requirements of modern civilisation are so varied and complex, and we live at such a rapid pace, that even the prac-

tice of architecture has been invaded by "specialists" who apparently imagine that a thorough knowledge of technical details will compensate for a lack of knowledge of the art of their profession. There is hardly any modern pretender so lacking in justification by his works as the architectural expert or specialist. It may be argued that this is the only scientific method of dealing with modern complicated requirements; if so, its scientific efficiency hardly justifies its artistic barrenness. My earnest advice to you is to make your practice cover as wide a field as possible; shun specialism, however lucrative it may appear.

Within the scope of a moderate practice you will find extensive demands made upon your knowledge. Apart from the capacity to design, there must be the ability to design within the limits imposed by the requirements of the Building Acts of London, provincial and urban authorities, to utilise in the best way the properties of steel, iron and concrete, as well as the older building materials, stone, brick and wood. You must also be conversant with the latest patents in pavement lights, have a knowledge of the virtues of glass tiling, know the strong features of burglar-proof sash fasteners, and give a warranty that your door-knobs will never come off the spindle. Besides this all-embracing knowledge that is required of us, a new danger is rising up, born of our advancing civilisation. We are now in the glorious days of trusts and combines, when everything is on a colossal scale, especially the capitalisation, and no doubt the inherent poverty of our profession is the only thing that thus far has saved us. Think of the waste of energy going on in the artistic world to-day, of painters and sculptors creating pictures and statues and trying to find a market for them—often in vain. Imagine the immense saving that could be effected by a Pierpont Morgan buying up the output of Sargeant, Whistler, Shannon, Swan, Guthrie, Lavery, Brock, Gilbert, Frampton, and putting these artists on regular employment at a fixed wage, under healthy conditions in a factory complying with all the requirements of the Factories Act, whatever these may be. Saved from the rapacities of the "dealer," in Bond Street and out of it, what magnificent works these men would turn out, while the public would no longer have to go to the dealers to be advised as to the safest thing in which they might invest their money, as if works of art were mining shares and dealt in for the rise or fall of an active market. The only bar to the success of such a scheme comes, strangely enough, from the artists themselves.

I have talked so long on some of the realities that little time is now left in which to speak of the ideal practice. It is like the promised land—before our eyes, but never beneath our feet. Of what would such a practice consist? we ask, and everyone's temperament will dictate a different answer.

The ideal practice must surely be that which insures the evolution of the individual in the advancement of his art. To progress along parallel lines with your art must be a desirable thing, though it can hardly be said that, as a rule, our practice affords many facilities of this kind. Some requirements necessary to this end are common to many of us; these can be summarised as follows:—Work which is congenial to our temperament, and in which a healthy interest may be taken. Time to think out our problems as a whole and evolve slowly their detail. Absence of all "rush and worry." An appreciation of the good points in our designs by those for whom the work is done. A few assistants, good men and true, who will carry the knowledge gained a step further on their own account. I could guess the young practitioner's ideal to be, that his buildings would turn out as fine as his conception of them, but the hard facts of reality destroy the charm of these imaginings. I could guess the middle-aged practitioner's ideal to be, to begin again, with all the vigour and enthusiasm of youth, coupled with the matured experience of his years, but this combination is impossible of realisation. I could guess the old man's ideal to be, to be spared to practice for a few years that great art to the threshold of which many years of travel has brought him, but the inexorable summons comes, he steps across another threshold and the door closes behind him for ever.

As far as the necessities of living will permit us, I think we should do all we can to realise our ideal practice, to advance the science and art of our calling, to do justice to our clients, our builders and ourselves, and to uphold the honour and dignity of our profession.

Mr. COLE A. ADAMS, in proposing a vote of thanks to the author, said he could hardly add any information to the excellent paper they had heard read. Reference had been made to the need of giving pupils and assistants in architects' offices hints and suggestions. The speaker thought that the more this rule was spread abroad the better for the profession. It often happened that after spending many years as assistant in an office the young architect when starting on his own account had little idea of how to manage his business. He, the speaker, had always adopted the rule in his office, and encouraged his pupils to discuss any point that might arise in their work.

Mr. A. O. COLLARD, who seconded the motion, said there



was no doubt that the harder pupils and assistants worked on problems raised in the office, the better would be their knowledge of architecture afterwards. For successfully dealing with clients he thought architects might cultivate the manner known among doctors as the bedside manner. Such sympathy seemed essential to a doctor's practice, and architects might imitate them. Architects were rather apt to think of practicable methods and practical people like builders, and they forgot that other clients might require some different treatment. The experience of successful architects seemed to point to the necessity of getting one's own way with clients, and therefore it would be hazardous to adopt any but a persuasive manner.

Mr E. GREENOP, in supporting the vote, said from his point of view the real and the ideal practice would be similar. The real was full of difficulties, and the ideal should be the same.

Mr. C. H. BRODIE said the profession was to blame for the lack of experience so often shown by young architects in their dealings with clients. There was no reason why the pupil should not be present at the consultations which took place in the office and on the job. If architects would give up the attitude of suspicion they so often adopted towards their assistants the profession would benefit. He also wished to see abolished the custom of sometimes inserting a clause in a pupil's articles which prohibited him, after having served his time, practising within a fixed radius of his master's office. Referring to engineers and bridgework, the speaker said they were forced to ask themselves why individuals and governing bodies placed more reliance on the engineer than on the architect. He believed it was because the engineer always knew his materials and their limits in construction. It would be well for the young architect of to-day to possess the same knowledge. Let them study their materials, and the amalgamation of the real with the ideal would be an accomplished fact.

The CHAIRMAN, thanking Mr. Gibson for his paper, said it was well for a young architect before beginning on his own account to have been engaged as managing assistant in another architect's office. Such experience was gained as made him more confident in his own powers. The answer to the question of how to conduct a practice depended upon the sort of architect the pupil was engaged to. Many architects made it a rule to discuss points raised in their work before their assistants; such practice was common to the smaller offices. He quite agreed with Mr. Brodie that the pupil should not bind himself by signing articles or indentures when a clause was inserted prohibiting future practice within a certain radius. He could not believe that such clauses were often inserted.

Mr. GIBSON briefly replied. He did not advocate the cultivation of a "bedside" manner in dealing with clients, nor could it be said that all doctors took up such an attitude towards their patients. The "bedside" manner could be carried to excess. He had never seen a clause in any articles prohibiting practice within a certain radius, and he advised any man to positively refuse to sign any such document.

## FACE-SHAFTS OF HEREFORD CATHEDRAL.

THE following article, which appeared in the *Eccelesiologist* for June 1849, while the restoration of Hereford Cathedral was in progress, will suggest the difficulty of dealing with a peculiarity which was a surprise to many archaeologists:—

The restoration of this church still continues with unabated energy. A very strong opinion having prevailed that a portion should be opened as speedily as possible for Divine service, which has been interrupted for seven or eight years, it was resolved by the committee that the nave should be forthwith completed for that purpose with temporary fittings, the committee having funds at their disposal sufficient for that object, though not for the completion of the choir and greater transepts. On the removal of the present floor with the view of restoring the pavement to its original level, it was discovered that the Norman piers, instead of resting on circular bases of small projection, were placed on bold square bases which had been concealed under the modern paving. These, when opened to the original level, gave an unusually fine proportion to the massive Romanesque pier-range of the nave, though the piers, when buried, had presented a depressed and stumpy appearance. Nor was this the only discovery: the small plinths which served as bases to the double semi-cylindrical face shafts, formerly running up the face of the piers, were also brought to light, the original face-shafts having been removed to make way for an incongruous triple vaulting shaft substituted by Wyatt when he erected the meagre triforium with its painfully glaring clerestory after the fall of the great western tower in 1786.

The restoration of the face-shafts, although scrupulously copied from the ancient examples still remaining on the opposite side of the piers (having never been removed by Wyatt)

terminating as they do in small double capitals reaching only to the height of the capitals of the great cylindrical piers, instead of being carried up as vaulting-shafts, has occasioned much discussion not only in the committee, but amongst others who are loud in their condemnation of them as non-supporting capitals—a supposed grievous architectural anomaly. But independently of the extremely diminutive proportion of the capitals and abaci, which, when sculptured, scarcely project beyond the larger capitals of the piers that are bisected by them, it is clear that they formerly existed, a fact sufficient to justify parties engaged in a work of restoration in replacing them. This is not only proved by the buried plinths, but by this identical feature being found at the back of these very piers. What appears a still further justification of the decision of the committee is that the self-same anomaly of their being non-supporting shafts is found existing in a precisely similar manner in the aisles, where the vaulting springs from corbels detached from the capitals of the face-shafts by an interval of several feet, thus proving beyond contradiction that for nearly five centuries, when the Middle-pointed roof was erected, they could not have served the purposes of vaulting-shafts, or have afforded any real support to the groining.

Though it is conceived that the examples in their own cathedral would partly exculpate the committee, yet, as instances are not wanting elsewhere to show that even the soundest theory was sometimes departed from in practice, it may be permitted shortly to refer to some examples in further corroboration of the remark. Thus in the church of St. Ambrogio at Milan similar face-shafts to those at Hereford are to be met with, extending no higher than the base of the triforium, where these capitals lose themselves under a corbel table, which has no more need of such support than a string-course. In the meantime the construction of the fabric plainly shows that they could never at any period, either in appearance or reality, have served the purpose of vaulting-shafts for the support of the roof. Again in the cloisters of the cathedral of St. Trophimus at Arles, a Romanesque building apparently interspersed with fragments of the Roman antiquities with which the neighbourhood abounds, a still more flagrant instance occurs. Here Corinthian pilasters of considerable depth, which have not even an entablature to support, serve the purpose of buttresses. The most complete case in point, however, is to be met with in the magnificent nave of the cathedral at Bayeux, the piers of which, though not exactly similar in other respects, are ornamented with face-shafts terminating in small capitals precisely resembling those which have been so loudly condemned at Hereford; while the vaulting-shafts spring from corbels at the base of the triforium exactly as Mr. Cottingham has proposed. These instances are by no means brought forward as examples for imitation, but to afford additional proof, if such were wanting, that the ancient architects did not scruple occasionally to depart from a minute attention to a theory or principle with which they must have been well acquainted, when either special circumstances rendered it advisable, or the necessities of construction did not require them to be bound by it.

By thus disregarding the chance of censure in preference to a blind adherence to a theory, the committee have been enabled to preserve an extremely rare feature of unusual interest, the occurrence of the double face-shaft not being to be found in any of the pier-ranges of the larger Romanesque buildings in this country. At least it is certain, if the engravings are to be depended upon, that it does not occur at Gloucester, Tewkesbury, Leominster, St. Cross, Malmesbury, Durham, Peterborough, Waltham Abbey, or Christ Church, Oxford; and the effect produced by it, affording as it does shadow and variety, instead of the monotony of a smooth cylindrical mass, needs only to be seen to be appreciated, and to justify the decision which has been arrived at.

The triforium and clerestory, with the vaulting, being of fair and harmonious proportion, will, when cleared of white-wash, notwithstanding some offensive and palpable defects, present an appearance of solemnity and church-like character; and should the vaulting be decorated as proposed, with stencilled diapering of appropriate design (the ribs of the groining, though of wood, being of better character than was common at the period when it was erected), it cannot fail to produce a striking and solemn effect, not only from its being in keeping with the warm tint of the natural stone, but as harmonising with the subdued tone of colour of the black and red Staffordshire tiles (arranged in compartments), with which it has been determined to pave the nave and aisles.

One more circumstance remains to be noticed. It being clearly impracticable to attempt to unite the restored face-shafts of the piers with Wyatt's triple vaulting-shafts, no change will be made in Mr. Cottingham's design, which, before the discovery of the plinths before alluded to, had provided for their removal from the face of the piers, and made them spring from brackets on a level with the string-course of the triforium, an arrangement (now that it has been determined to replace the face-shafts according to the original design), which secures to



the pier-range—the only portion of the nave which is really ancient—a perfect and complete restoration; thus separating by a broader line of demarcation than ever the ancient from the modern work—the work of Lozing or of Rayneim from the work of Wyatt.

### ALLEGED ENCROACHMENT ON THE STRAND.

AT the meeting of the London County Council last week a discussion took place upon a recommendation of the improvements committee that 203<sup>1</sup>/<sub>2</sub> should be paid by the Council to the owners of Carr's Restaurant at the eastern end of the new curved street connected with the Holborn to Strand improvement, in consideration of being relieved from the obligation of constructing new vaults. In their report upon the subject the committee mentioned that the vaults which had been constructed extended beyond the old frontage line and under the existing footway to an extent varying from 6½ inches to 1 foot 8 inches—that was to say, the vaults projected 16 feet beyond the new frontage line of the building instead of 12 feet, as allowed in the case of other vaults along the new street. It had already been arranged to plant trees on the footways, and to enable that to be done in front of Carr's Restaurant (a length of 104 feet) it would now be necessary to alter the position of the subway for pipes. The owner of the restaurant, before constructing the vaults, obtained the sanction of the Westminster City Council, but the committee were advised by the solicitor that, having regard to the special provisions of the Act of 1899, which authorised the improvement, the Council was the only authority having power to sanction the construction and extent of the vaults. The City Council did not, however, accept this contention of the Council, and stated that it failed to see that its action in the matter had been in excess of the statutory authority possessed by it under the Metropolitan Management Act, 1855, or had impinged upon the special powers obtained by the Council. The committee learnt that Mr. Cox (the owner of the premises) had already let a large portion of the new vaults, and, whilst they regretted that the architect (Mr. Emden) acting for Mr. Cox did not, after communicating with the local authority, inform them of his intention to construct the vaults to the line sanctioned by the Westminster City Council, they felt that, having regard to all the circumstances, they could hardly advise the Council to refuse payment until the vaults had been reduced to the 500 superficial feet, as originally agreed with Mr. Emden.

Mr. Benn thought the recommendation hardly strong enough to meet the case, and that Mr. Cox should be asked to restore the land he had occupied beyond the 12 feet. He therefore moved to add to the recommendation the words, "and also requiring Mr. Cox to make proper application, with plan, for the land already taken by him for vaults up to the frontage line of 12 feet and to surrender to the Council the portion of the vaults which is more than 12 feet in advance of the new frontage line and to construct the necessary dividing wall."

Mr. Goodman seconded the amendment.

Mr. Emden narrated the whole circumstances of the case, and denied that he knew that the subsoil at this position was vested in the London County Council or that it was necessary to have the plans sanctioned by the Council.

Mr. Robinson pointed out that there was so much doubt about who was the authority that it was easy to understand how a mistake might have occurred here.

Mr. Sidney Low hoped that, after the explanations, Mr. Benn would see fit to withdraw his amendment. If, however, it was persisted in, it would be very likely to inflict inconvenience on the Council and a great deal of cost on the ratepayers, because the question would not be settled without recourse to a court of law. If the Council's legal position in the matter was, as they were told, unassailable, they should explain how it was that they did not enforce their legal rights. If there was negligence, that negligence was shared in by the Council as well as Mr. Emden.

Colonel Probyn was satisfied that neither Mr. Emden nor Mr. Cox had the slightest idea of taking advantage of the Council. Rather than take the matter to the courts of law, he thought they should submit it to arbitration.

Lord Russell said that it might have been by an honest mistake, but at any rate the Council had had a portion of its new street filched from it without its knowledge. Mistake or not, they could not submit to that without having the matter tested.

Mr. McKinnon Wood suggested that perhaps the best course would be, as there were many issues involved, that the whole subject should be referred to the general purposes committee.

Mr. Benn agreed and withdrew his amendment.

Mr. McKinnon Wood moved that the matter be referred to the general purposes committee.

Mr. Harris seconded the amendment, which was adopted.

### THE IRISH INSTITUTE OF ARCHITECTS.

THE annual meeting of the Royal Institute of Architects of Ireland was held on the 4th inst. Mr. George C. Ashlin occupied the chair, and there were present Messrs. W. J. Gilliland, Charles H. Ashworth, Robert J. Stirling, R. C. Orpen, W. Kaye Parry, Harry Allbery, Thomas A. Coleman, Frederick Hayes, J. Rawson Carroll, C. J. MacCarthy, A. E. Murray, James Webb, C. A. Owen, Joseph Holloway, Fred Shaw, Geo. L. O'Connor, R. O'Brien Smyth, M. G. Hicks, W. W. Mitchell, R. C. Millar, Fred Batchelor, A. G. C. Millar and Sir Thomas Drew.

The President in the course of his address said:—The revision of our recognised form of building contract has now become a pressing question, chiefly in consequence of the communications addressed to us by the Irish Builders' Association, and of the favourable view taken of many of their proposals by the Royal Institute of British Architects and of other bodies representing the profession in England. The present recognised conditions of contract have stood the test of experience for many years fairly well, and have been generally accepted by both parties to the contract. No desire for any radical change has been expressed on the part of the employers. From the nature of the case this could hardly have been expected so far, but as they will naturally look to us to safeguard their interests, it would seem proper to endeavour to ascertain their views by consulting public boards representing employers and by adopting any other means in our power before consenting to any radical change in the present recognised form of contract. There appear to be two such changes proposed, viz. (a) the appointment of an independent arbitrator to adjudicate during the progress of the work on such questions as the meaning of the plans and specification hitherto left to the sole decision of the architect; (b) the taking of the quantities part of the contract. A most laudable desire has lately sprung up amongst our junior members and aspirants in the profession to improve the system of architectural education, with a view of obtaining a distinctive qualification by compulsory examination, as in other professions, and I presume, of paving the way ultimately to the statutory registration of all practising architects. I am sure the senior members sympathise with this desire thoroughly, and would be most willing to aid the movement in any way in their power.

Mr. W. Kaye Parry read the report of the Council for the year, which stated that, though comparatively uneventful, the year had been characterised by steady work. It then referred to the routine business which had been transacted by the body during the year. The statement made in the House of Commons last May by Mr. Austen Chamberlain respecting the proposed College of Science buildings in Upper Merriem Street naturally came as a surprise and disappointment to the profession. Your Council, having considered the matter, passed unanimously the following resolution giving expression to their views on the extraordinary proposal of the Government, viz.:—"That the attention of the Council having been drawn to a statement of Mr. Austen Chamberlain in the House of Commons on May 28, thus reported, 'As to the architect, before the Bill left the House he would give the name of the architect selected. No choice had yet been made, but he had been in communication with the Chief Secretary and the Department of Agriculture, who were entitled to a voice in the matter, and the claims of several architects, both Irish and British, had been considered. Personally, he should be most anxious to have an Irish architect, but, in any case, whatever was done, hon. members might rest assured that the Government should associate an Irish architect with the work.' The Council deprecate that only in mere concession to Irish sentiment an Irish architect should be associated with an English architect in designing and carrying out the proposed public offices (College of Science) in Dublin. It resents the imputation conveyed publicly that, in the opinion of the authorities of His Majesty's Treasury, there is not in Ireland an architect of sufficient reputation and capacity to design and carry out such a work as sole architect in the usual manner."

Sir Thomas Drew said that they were very careless in Dublin in exhibiting architectural works. They had ample opportunity for exhibition purposes at the Royal Hibernian Academy, and this privilege, in his opinion, should be availed of as much as possible.

On the motion of Sir Thomas Drew, seconded by Mr. R. O'Brien Smyth, the report was unanimously adopted.

The hon. treasurer read the statement of accounts, which showed a balance in hand of 91<sup>1</sup>/<sub>2</sub> 7s. 1d., which left their position better by 25<sup>1</sup>/<sub>2</sub> than last year.

The following members were elected as Council for the ensuing year:—C. J. MacCarthy, Sir Thomas Drew, R. C. Orpen, W. M. Mitchell, J. Rawson Carroll, A. E. Murray, G. P. Sheridan, F. Batchelor and G. Geoghegan.

A resolution in favour of the registration of architects was proposed by Mr. Frederick Shaw and seconded by Mr. Harry Allbery.

Sir Thomas Drew said that he was one of those opposed to



egistration, and he would move as an amendment that no steps be at present taken in the matter.

Mr. Murray seconded the amendment.

Mr. J. Rawson Carroll suggested that the original motion be withdrawn. In his opinion it should be the parent institution in London which should first move in this matter.

After some further discussion the motion was withdrawn and the proceedings terminated.

The annual dinner subsequently took place in the Shelbourne Hotel, at which the president, Mr. G. C. Ashlin, also took the chair.

After the cloth had been removed, the Chairman gave the toast of "The King," which was loyally honoured, and the toast of "Queen Alexandra, the Prince and Princess of Wales and the other members of the Royal Family."

Dr. Trail, in proposing the toast of "The Learned Profession," said it was an extraordinary thing that in England they were discussing the religious question which was settled long ago in Ireland. With regard to the medical profession, he observed that Sir Thomas Myles warned young men against joining the Army Medical Service, and Surgeon Ormsby said they should avoid becoming dispensary doctors. Both gentlemen were wrong. The Army Medical Service was a splendid one and should not be run down. With regard to dispensary service he might say that if Irishmen refused to take up appointments there were many men from Edinburgh and Glasgow who would be ready to step into their shoes.

The toast was drunk with enthusiasm.

Most Rev. Dr. Donnelly replied.

Sir Christopher Nixon, in responding for the medical profession, said the Institute of Architects had held its own amongst the other professions, and they had only to look at the magnificent buildings of Dublin to recognise what splendid work Irish architects had done. No one could represent the profession more worthily than their distinguished President. Regarding the medical department of the Army, he thought it afforded an excellent service for young medical men to embark upon. Many improvements had been made in it, and it now offered a good career. He must say that if he had a son entering the medical profession he would advise him to choose the Army Medical Service in preference to any other service in connection with the profession. It was not so in the Irish Dispensary Service, and he was quite at one with the President of the College of Surgeons when he urged the young members of the profession to work together to get better recognition for their work.

Surgeon Ormsby, in responding, said he believed the attitude he had taken up regarding the young members of the medical profession was the right one.

Mr. Charles Stanuall also replied.

Sir Thomas Drew proposed "Our Guests," which was responded to by Canon Hogan, Mr. J. H. Ryan, Professor Thrift and Colonel Plunkett.

Mr. O'Neill, chairman of the Dublin County Council, proposed "The Royal Institute of the Architects of Ireland."

The Chairman, in responding, expressed the pleasure he felt at the presence at the dinner of a representative of the Royal Hibernian Academy, and suggested the advisability of starting an architectural school as distinct from the sculptural school in the Academy, which would attract young men desirous of entering the profession.

During the evening a very enjoyable musical programme was rendered by Messrs. H. and E. Broadberry, Evan Cox, J. Horan and Dan Jones.

## THE LIVERPOOL HOUSING SCHEME.

THE housing committee of the Liverpool City Council have recently taken a survey of the work which lies before them. The result is to show that an immense amount remains to be done before a thoroughly healthy city can become possible. The Corporation have undertaken, says the *Manchester Guardian*, to demolish and clear away great areas of insanitary property near the centre of the city and to build in their stead good and wholesome houses, to be let at low rentals to the poorest part of the population. It is estimated that this work will ultimately cost about one million and a half of money. There are no fewer than ten thousand condemned houses to be swept away and replaced by habitable dwellings. The Corporation, it should be explained, have not formulated any comprehensive scheme for dealing with their task. Their main object is to house the people who are unhoused from the condemned areas, and to do this properly requires caution and a careful adaptation of the amount of building to the housing needs of the moment. They will go on steadily demolishing and rebuilding until the Augean stable is cleared out and the poor workers of Liverpool have a fair chance of living healthy lives.

The history of housing in Liverpool is in some ways remarkable. For the past forty years the Corporation has been

using its powers under local Acts and destroying bad property here and there. But until recent years very little was done of a constructive kind. The natural consequence has been a good deal of overcrowding, and this the municipality is now doing its best to relieve. For the past six years constructive reform has been in the forefront of the Corporation's programme. As areas have been cleared dwellings have been erected on the sites until now some seven separate blocks of dwellings, of varying description, are to let to tenants. These municipal houses are bright spots in a dreary picture. How dismal the picture is can only be learned by exploring these dark byways and observing the life that is lived in them. The general description of court property in Liverpool is well known.

The houses contain three rooms, placed one above another, the staircase leading direct from one room to the other. In many instances little if any sunlight can get to the courts, and the atmosphere within the dwellings is always foul. The houses are placed back to back and side to side with one another, and have no adequate or through ventilation. They are closely arranged in courts, which are approached by narrow passages, these in most instances being converted into tunnels by the extension over them of the room usually occupied as a bedroom. Extreme dilapidation, long-continued neglect and inattention, filth-saturation of porous materials combine with the original vicious construction of the property to render it unfit for human habitation.

These words of the Medical Officer of Health give some idea of the ten thousand houses which are now happily doomed to be destroyed. High, narrow courts whose walls shut out the sun and air; hundreds of the old cellar dwellings; rickety houses tottering to a fall, with sanitary arrangements of a barbarous kind—with all these things is it any wonder that the death-rate is high? As to the death-rate, there is no gain-saying the hard statistics of the medical authorities. In two of the areas most recently condemned, the annual death-rate for the three years 1898-1900 was 40.4 and 49.3 per thousand respectively, and of this a large proportion consisted of the deaths of children under five years. Dr. Hope says of one of these places:—

"It is identified with the history of disease and mortality in the city, and its records are those of suffering and misery. From time to time it has come into conspicuous prominence owing to outbreaks of disease of exceptional severity."

Nothing in Liverpool is very old, but much of this property is almost as old as the city, and figures on maps made at the beginning of last century. Some years ago the parks committee of the Corporation wished to brighten the homes of the poorer citizens by distributing flowering plants to be put in their windows. But in these worst slums the kindly proposal could not be carried out. The councillors were advised that in such air flowers had no chance of life, and their plan was abandoned. What chance of life had the human child?

The housing policy of Liverpool is distinguished by two definite characteristics. First, it is a cardinal point in the programme to provide for the poorest part of the population. The Corporation is attempting to house the docker, the casual labourer and the hawker rather than the better-to-do artisan. This being the case, they have done nothing towards erecting workmen's cottages on the outskirts of the city, relying on an improved train or tram service to carry the workers to and fro. The persons who at present inhabit the condemned rookeries are nearly all employed in or about the docks and the river-side. The average wage among them ranges probably from eighteen shillings to one pound a week. Their conditions of employment are precarious and casual. The housing committee therefore consider it the wiser plan to rehouse the dockers in healthy houses on the sites of their present dwellings, so that they can remain near their work. The question of building on the outskirts is left over for future consideration. It is noticeable that the Medical Officer of Health in his successive reports has urged the desirability of rehousing at least a portion of the unhoused tenants on land on the fringe of the city. It is generally felt that on purely sanitary grounds this would be a good course, and it is possible that experiments in this direction will be made. An interesting experiment in housing the very poor was made a few years ago by Mr. Boulnois, then the city engineer. Mr. Boulnois's plan was to build tenements so cheaply that they could be let at a unit charge of about one shilling per room. Gildharts' Gardens, a block of about ninety two-roomed houses, was the result. The place is plain even to severity, but it is thoroughly sanitary. The rents of some of the holdings are so low as half a crown a week. The experiment in this extreme form has never been repeated. The many dwellings erected since have been more generous in design and accommodation, and the average rent is between four and six shillings. The Corporation have built one great block of "barrack" dwellings in Victoria Square (which correspond roughly to the Pollard Street or Oldham Road dwellings in Manchester) and one smaller block. With these



exceptions, all the Corporation houses are on very much the same plan. They are a sort of combination or happy compromise between the block dwellings and the small independent house. The flat system is followed throughout. The houses are for the most part two or three roomed, and the rents vary roughly from 2s. 6d. to 6s. a week. In nearly every instance the tenant has his separate entrance, separate scullery and conveniences, and often a good yard. The houses are strongly built, and the space is ingeniously utilised. The outside appearance is sometimes attractive, and contrasts with the squalor around. In one block, the Dryden Street houses, there is the added luxury of hot water. Here, too, there is a recreation-room for the use of the dwellers, and concerts are occasionally provided. Building is going on briskly in five other areas. Narrow streets are being made wide, and in place of court and alley there are rising hundreds of pleasant and sanitary homes.

The second outstanding feature of the work is that the Corporation are housing the unhouseed. No one is allowed to become a tenant of a Corporation house who has not lived in a house which the Corporation has demolished. This restriction naturally increases the difficulty of the problem. The tenants of the new houses are drawn from the most shiftless part of the population. For many of these people rescue from the old conditions means the start of a new life. The instinct of cleanliness revives, and they come to take a pride in making their modest dwelling comfortable and pleasant. Help is given in many ways by the wise supervision of the Corporation officials. Up to the present time the Corporation has housed 6,250 persons, of whom 4,500 were unhouseed for demolished dwellings.

A word on the financial aspect of the question. The cost of demolishing the 9,943 structurally insanitary houses has been estimated at 342,000*l.* A further cost of 250,000*l.* will be involved by the purchase of property which is not insanitary, but which will be necessary to obtain sites for rebuilding. The sum of 592,000*l.* therefore represents, roughly, the minimum cost of demolishing the structurally insanitary property in Liverpool and of acquiring suitable rebuilding sites. Adequately to rehouse the dispossessed persons it is thought that at least 6,000 houses will have to be erected, and this will cost 900,000*l.*, bringing up the total estimated expenditure in round figures to one and a half million. The houses already erected and those now in course of erection have cost together 227,129*l.* The charge on the city as the result of the housing and demolition work of the Corporation (after deducting the money received in rents) is about 21,000*l.* each year, which represents a rate of 1*1*/<sub>2</sub>*d.* in the pound. If the Local Government Board consent definitely to extend the period for repayment of loans the yearly indebtedness may be considerably reduced, and there are those who affirm that were the period for repayment fixed at eighty years the housing work of Liverpool would cost the rates not a single penny.

### THE ASSIOUT DAM.

A MORE picturesque situation than that of Assiout, says the *Daily Telegraph*, cannot well be imagined. The thriving capital of Upper Egypt lies in a fertile plain at the foot of the Libyan Mountains. In front of its domes and minarets flows the Nile, wide and peaceful as a lake, and on the other bank is a noble belt of palms quite a couple of miles long. The weir is situated about half a mile below the town, just below the intake of the great Ibrahimyah Canal, which affords the main water supply of Middle Egypt and the Fayoum. It consists of 111 arches of masonry, and is rather more than half a mile long. It was built by Messrs. Aird in a period of less than three years and a half, and has already been submitted to the severest of all tests—that of holding up the Nile in flood—with complete success. During the months of May and June 1900 the average daily number of men at work upon it was 13,000. The special difficulty to be overcome in its construction was that of the foundation, for it is literally built upon the shifting sand. But the engineers of to-day have profited by the experience of their forerunners, and every problem has been adequately met. The barrage rests upon a platform of masonry 87 feet wide and 10 feet thick, which is protected on both sides—and here comes in the skill of recent days—by a continuous and impermeable facing of cast-iron sunk to a depth of 23 feet beneath the bed of the river. Whilst the work was in progress Sir Benjamin Baker tells us that the water had to be kept down by the uninterrupted use of seventeen 12-inch centrifugal pumps, throwing enough water for the supply of a city of two million inhabitants, while in a single season as many as a million and a half sandbags were used in the construction of temporary dams. At the western end of the barrage is a lock which is large enough to accommodate the *Rameses*, the most bulky steamer on the Nile. Whilst the work was in progress many new difficulties had to be coped with. Sometimes the working

of the powerful pumps drew the sand from beneath the foundations, so that liquid cement had to be poured in under pressure to fill up the gaps; at others springs—to the number of 1,000 in all—burst up through the sand, each requiring special treatment. But all this is over now, and there seems no reason why, under the supervision of the permanent staff, the Assiout barrage should not stand firm for ever.

Assiout is about 250 miles from Cairo, 350 miles further up, just beyond Assouan, the Nile rushes between black granite rocks, to form the series of rapids known as the First Cataract. It is here, through the very heart of the cataract, that the third and grandest dam has been built. The idea of checking the current at this spot is by no means a new one; even an untrained eye can appreciate the advantages of the site. But the credit of proving that it was the best possible, and of devising a practical scheme for its utilisation, belongs to one man alone, Mr. Willcocks, formerly director-general of reservoirs in Egypt. This great engineer, to whom Egypt owes so many reforms, worked out a plan by which a reservoir could be formed to store 3,700 million cubic metres of water above a series of curved dams. Unfortunately this would have involved the submersion of the temples on the island of Philæ. In order to prevent this Mr. Willcocks was asked to draw up fresh plans for a single dam, which should maintain a less quantity of water—under a third of that originally intended—at a somewhat lower level. This new design is the basis of the work of which the foundation-stone was laid by His Royal Highness the Duke of Connaught on February 12, 1889, and which was opened in state on Wednesday.

The completed barrage is a truly stupendous monument of industry and skill. Looking from the hills at either end one sees a solid arm of masonry a mile and a quarter long, thrust straight across from one side of the valley to the other. The greatest height of the wall is 130 feet, two-thirds that of the Monument; the width of its base is 100 feet, and its top, along which a light railway runs, is as wide as Fleet Street. It is pierced by 180 openings, through which, when the river is in flood, 15,000 tons of water may pass every second. The difference between the water level on the two sides is 67 feet, and the total masonry weighs over a million tons. All this would be very wonderful if the structure had been erected upon terra firma. It becomes almost awe-inspiring when we reflect that it was carried out in the midst of raging torrents, angrily seeking by night and day to sweep away the intruding obstruction. And it must be recorded, to the everlasting credit of all concerned, that the work was carried out well within the stipulated time, and for much less than the contract price.

It was not, of course, possible to span the whole river at the same time; the various channels into which the "cataract" is broken by the intervening islands had to be attacked separately. The plan of action was uniform and comparatively simple in theory, though great and special practical difficulties cropped up in some places. The first thing to do was to get a section of the river bed dry. This was effected by enclosing it between temporary rubble dams or "sudds," and then removing the water by means of powerful pumps. Stones up to twelve tons in weight were tipped in to form these dams; in one channel even blocks of this size were washed away by the force of the current, and so railway waggons loaded with stones and bound with iron wire—each weighing in all fifty tons—were dropped into the stream, and eventually proved effective. The rubble dams were made watertight by means of sandbags, and the exhaustion of the contained water by pumps proved an easier task than had been anticipated. Not so the next stage in the proceedings—the laying of the foundations. To do this the mud had to be dug away till soft rock was found; this was then blasted until the hard, living rock was reached. The amount of rotten rock was very variable, but on the whole much greater than had been anticipated, so that the foundations are in places some 40 feet deeper than had been expected. Once the foundations were laid, building proceeded apace. While the river was low all hands, up to 12,000, were crammed on to the work, which for a time proceeded by night as well as by day. Various portions were in different stages at the same time, and the visitor could see in one place the building of a sudd, in another the blasting of the rock, and in a third the laying of a coping-stone on the parapet—all on the same day. In one respect the conditions at Assouan differed widely from those at Assiout. The latter is a city of 50,000 inhabitants, within eight hours of Cairo; the former has a population under 15,000, is 22 hours from Cairo, and but 35 miles from the tropics. A new town had hence to be built, supplied and doctored. The contractors, Messrs. Aird, spared no effort in the interest of their workmen's health and comfort, and were rewarded by their remaining notably free from serious illness. An excellent hospital was equipped, with separate wards for the various nationalities, and no expense was grudged in the provision of drugs and appliances. Well-qualified European doctors were in charge, and one of them, Dr. A. T. White, now of the Egyptian Sanitary Service, devised a plan by which



the risk of death from heat-stroke—the temperature sometimes reached 122 degs. in the shade—was minimised. At numerous points in the works area he had tents raised, each surmounted by a Geneva cross, and containing a bath, an ice-box and a telephone. If a man fell down from the heat he was put in the bath, ice was added to the water, and the doctor rung up; when the latter arrived he found the patient already under treatment. This ingenious arrangement proved a great success; the loss from the heat was reduced to almost imperceptible proportions.

So much for the actual work. What is to be the result? It is hoped that not only will a largely increased area be brought under cultivation, but that much land which at present yields but one crop a year will be enabled to bear twice in the season. Something in this direction has already been attained. In 1900 the Cairo barrage saved the cotton crop in the Delta from utter disaster, and only this summer the prompt action of Mr. Webb in closing the Assiout barrage while the Nile was in full flood rescued Middle Egypt from a very probable famine. This barrage will, it is hoped, by retaining more water for the Ibrahimyah Canal bring 300,000 acres of additional land under the plough. When we remember that land in Egypt is usually rented at from 6% per annum per acre upwards the value to the country can be guessed, if not fully estimated. Lord Cromer reckons that the recent improvements in the Cairo barrage have doubled the cotton crop of Egypt, which means an annual gain of over 5,000,000*l.* As for the Assouan dam, it is too early to speculate on its effects. Certain it is that a lake nearly 150 miles in length will be formed above it, a lake which it has been estimated would extend from London to Nottingham, and still have enough water left over to fill Windermere. The contents of this reservoir will be doled out to Egypt drop by drop, in exact proportion to the needs of the land. Thousands of acres of desert sand will be converted into fertile fields, other thousands will be transformed from scanty pastures into rich plantations; but this is not the end. Further plans are already in the air, and a new dam is already talked of, up at Khartoum maybe, or perhaps on the Blue Nile, which shall assure the prosperity of the Soudan as well as of Egypt. Expeditions are at this moment on their way to investigate this problem, and much curiosity is felt in Egypt as to the results which will be arrived at. But all are confident that the future is safe in the hands of those who have brought the agriculture of Egypt to its present good fortune. Foremost among these are Lord Cromer and the Under-Secretary of State for Public Works, Sir William Garstin. It would not be fair to omit reference to the labours of Sir Benjamin Baker, as consulting engineer, and of Mr. Blue, as manager, and to the fact that the financial side of the problem was settled at the outset by Sir Ernest Cassel.

#### ROYAL ACADEMY SCHOOLS.

ON Wednesday evening Sir Edward Poynter, P.R.A., distributed the prizes to the successful students of the Royal Academy Schools at Burlington House. There was a large attendance of Academicians and Associates, as well as of the students and their friends. Prior to the distribution of the prizes, the President remarked that the members of the Royal Academy who had been examining the works this year wished him to say that in the two competitions of sets of six drawings from the life and four models from the life, as well as in paintings from the life, there was a very great advance and a much higher average in the quality of the works than had been remarked for the past two or three years. The prizes were then distributed as follows:—

Landscape painting, a tangled hedgerow: treated as a foreground, Creswick prize (30*l.*), Catherine Oules; painting of a figure from the life (open to male students only), silver medal, first, Frederick George Swaish; second, William Ewart G. Solomon; painting of a head from the life, silver medal, first, Henry Walter Peake; second, Frederick George Swaish; painting of a draped figure (open to female students only), silver medal, first, Alice Palgrave Walford; second, Ethel Mary L. Kendall; cartoon of a draped figure, a Sibyl, silver medal and prize (25*l.*), Walter Ernest Webster; design in monochrome for a figure picture, Sisera and Jael, Judges, ch. iv., v. 22, Armitage prizes, first (30*l.*) and bronze medal, Alfred William Sangster; second (10*l.*), Walter Ernest Webster; design for the decoration of a portion of a public building, dawn: an allegory with at least seven figures, prize (40*l.*), William Ewart G. Solomon; set of six drawings of a figure from the life (open to male students only), first prize (50*l.*) and silver medal, Frederick George Swaish; second (25*l.*), Frank Samuel Eastman; third (15*l.*), William Ewart G. Solomon; fourth (10*l.*), William George Simmonds (disqualified owing to having received a superior prize in the same competition before); drawing of a head from the life, silver medal, first, Ernest Townshend; second, Marian Alice Dibdin; drawing of a statue or group, silver medal, first, Maddison

Branch Fisher; second, Ernest Townshend; perspective drawing in outline (open to painters and sculptors only), the interior of Syzergh Castle in the Victoria and Albert Museum, silver medal, no competition; model of a design, Hagar and Ishmael, Genesis, ch. xxi., v. 19, first prize (30*l.*), Mary Constance Buzzard; second (10*l.*), Frederick Brook Hitch; set of four models of a figure from the life (open to male students only), first prize (50*l.*) and silver medal, Charles Leonard Hartwell; second (20*l.*), Charles James Pibworth (disqualified owing to having received the same prize before); model of a bust from the life (open to female students only), silver medal, first, not awarded; second, Elsbeth C. P. Rommell; model of a design containing figure and ornament, a panel for a drinking fountain, with a bronze spout in the centre, silver medal, Charles James Pibworth; model of a statue or group, silver medal, first, Leonard Jennings; second, Frederick Brook Hitch; design in architecture, a picture gallery for a country town, travelling studentship (60*l.*), James Black Fulton; set of architectural drawings, the hall of Eltham Palace: inside, showing roof, silver medal, first, Percy Ion Elton; second, Victor Wilkins; set of architectural designs (upper school), prize (25*l.*), Fitzroy Hyde Darke; set of drawings of an architectural design (lower school), prize (10*l.*), Alfred William Blomfield; plan of a building, a formal garden, prize (10*l.*), George Thow Smith; original composition in ornament, silver medal, no competition; perspective drawing in outline (open to architects only), the interior of Sir Christopher Wren's Court at Hampton Court Palace, silver medal, George Albert Hill. A Landseer scholarship in painting of 40*l.* a year, tenable for two years, has been awarded to William Charles Penn; the second Landseer scholarship in painting, and both Landseer scholarships in sculpture, were not awarded.

The President, in conclusion, said that he congratulated the students on a competition in which only one prize in the whole series was withheld.

#### SOCIETY OF ANTIQUARIES OF SCOTLAND.

THE usual monthly meeting of the Society of Antiquaries of Scotland was held on Monday night, Dr. David Murray, vice-president, in the chair. Dr. T. H. Bryce read a paper on "The Cairns of Arran," a record of further excavations during the season of 1902. Although this season's explorations have yielded few relics, and unfortunately no human osseous remains, they have provided certain data regarding the structural features of the sepulchral cairns, which are of considerable importance, and it was now possible to describe the original condition of these remarkable megalithic structures with some approach to certainty. The chief interest centred in the excavation of a large cairn, a hundred feet long by sixty feet in breadth, at the head of Kilmory Water. At one end of the cairn is a circular setting of stones, two of the members of which form the side stones of a portal, leading into a chamber which occupies one end of the cairn. This chamber was roofed in by five large flagstones, which rested on smaller flags built on one another, so that the courses successively overlapped each other inwards. The upper section of the chamber walls was thus built of small stones, like a dry-stone wall, but the deeper portion, on the top of which this wall was built, consisted of massive blocks set opposite each other on the marginal outlines of an oblong rectangular span, or narrow and trench-like chamber; subdivided into four compartments by massive slabs set across it. Entrance to the chamber is obtained through a very low portal placed some distance above the floor at one end of the chamber, the other end being closed by a tall slab extending from floor to roof. Each compartment of the chamber contained much charcoal, but beyond a chipped flake of flint and some minute fragments of bone, nothing was found. The well-known monument, called the Giant's Grave, at Whiting Bay, was next explored. It consists of a series of very large blocks of stone set opposite to each other, so as to form a trench-like chamber, originally also covered by a cairn, the remains of which extend to a length of 98 feet, with a breadth of 69 feet, and at the end at which the chamber is placed there are two standing stones at each corner, suggesting that there may have been a setting of stones round the portal as at the Kilmory cairn. The megalithic structure probably represents only the basal portion of the chamber walls. The stones are of very unequal heights, and it is probable that a walling of smaller stones was built upon the top of them to a uniform level on which the roofing flags were laid. One of these, a flag of very large size, still leans against the wall of the chamber. The chamber contained a considerable quantity of burnt human bones, and in the soil which formed its floor four leaf-shaped arrow-heads, three oval-shaped knives of flint and a number of fragments of pottery were found. Some of the pottery undoubtedly belonged to the type of vessel which has been found associated with neolithic sepulchral structures in the south-west of Scotland. Other structures of the same type were examined at Monamore, Glen Cloy and Monyguil. The general conclu-



sions reached last year that the megalithic chambers in Arran belong to the late Stone Age have been fully borne out, and it has now been ascertained that the denuded megalithic cists represent the basal portions of chambers which were roofed in by large flags resting on an upper walling of smaller stones superposed on the basal megaliths, and that while in no case is there a passage of approach to the chamber, there was probably in all a portal of entrance at one end from a circular or semicircular setting of standing stones in front of it. In the second paper Mr. Alfred W. Johnston gave some notes on the site of the so-called Earl's Palace at Orphir, Orkney, and the ruins of the round church there. In the "Orkneyinga Saga" it is stated that Earl Harald lived at Orfjara, and that in the year 1136 Earl Paul kept his Yule feast there. The farm buildings and a large drinking hall are referred to, and it is mentioned that a splendid church stood before the hall door, but lower down the slope. The purpose of the paper was to record the results of the author's investigation of the question of the site of the Earl's residence, which was merely one of the mensal farms of the earldom. The parish of Orphir takes its name from the homestead, which signifies a reef or neck of land connecting a tidal island with the mainland. Originally the name included the earl's estate of Orphir, Midland and Honton, to which latter is attached a tidal island called the Hohn of Honton, and described in Old Norse as Orfir-is-ey. The present homestead of Orphir is at the head of the bay of that name. Between the farm buildings and the shore is the parish church with the churchyard, in which are the ruins of the round church, the whole of the apse and part of the nave of which still remain. It is undoubtedly one of those twelfth-century churches (and the only one in Scotland) that were built in the period of the Crusades, in imitation of the Church of the Holy Sepulchre at Jerusalem, and was probably erected by Earl Hacon after his return from the Holy Land. In 1899 the grave-digger came upon foundations which appeared to correspond with the south wall of the earl's residence, and in the two following years this clue was followed up by the writer and Mr. Robert Flett of Bellevue, till the wall was excavated for a distance of 136 feet, and a door found corresponding with the description in the Saga. The whole site was covered with 5 feet of debris mixed with bones, shells and ashes. No manufactured relics were found, except the finely ornamented top of a comb of bone of the late Viking period. It is now proposed, in connection with the rebuilding of the parish church further to the west, to excavate the ruins of the round church that it may be preserved as an ancient monument. In the third paper Mr. Francis Lynn gave an account of the discovery of two cists containing urns at Longcroft in Lauderdale. The site was a small knoll below Longcroft farm. The core of the knoll is silurian rock, which has been quarried at one side. In May last some children discovered part of an urn sticking out of the quarry brink, and this led to the careful excavation of the knoll by the Messrs. Dickinson, Longcroft. The urn was found to have been placed in a cist in an inverted position over a deposit of burnt bones. At a little distance, and almost in the centre of the knoll, was another cist covered by a very large slab. At the bottom in the west end was a finely ornamented bowl-shaped urn of the food-vessel type. Both urns were exhibited by the Messrs. Dickinson. Mr. A. J. S. Brook also exhibited a fine silver medal or badge, the property of Miss Wright, having on one side the Royal arms and on the other St. Andrew with his cross and the inscription:—The Associated Sons of St. Andrew, a Club instituted at Edinburgh, 1807.

#### BIRMINGHAM ARCHÆOLOGICAL SOCIETY.

A meeting of the Society held in the Council Room of the Midland Institute on Wednesday, under the presidency of Mr. Howard Pearson, an interesting account of the monumental effigies in St. Martin's Church, Birmingham, was given by Mr. W. Fowler Carter, who has made a study of the subject. Mr. Carter gave a general history of the four monumental effigies which are now in the chancel of the church, and which dated from the latter part of the thirteenth century to the latter part of the fifteenth. He dealt with the earliest ascertainable positions occupied by the monuments, and of the treatment they had experienced since their erection. The first, he said, was possibly an effigy of Sir William Bermingham, who was killed at the battle of Evesham while fighting on the side of Simon de Montfort. Mr. Carter thought, however, that it was more likely to be that of his son of the same name. This effigy was cross-legged, and it was quite possible that he may have been a crusader. On that point the lecturer disagreed with the latter-day authorities, who thought that the crossing of the legs was not the sign of a crusader. The second was a dreadfully battered monument on the north-east corner of the chancel, and very likely was that of the most eminent member of the family, Sir Fulk Bermingham, who was a contemporary of Edward III, served under him at Crecy and the siege of Calais. Sir Fulk was probably at the battle

of Poitiers, and for many years was Knight of the Shire for the county of Warwick. The third and most beautiful of the monuments was an alabaster tomb usually said to be that of Sir John Bermingham, but Mr. Carter considered it more probable it was that of his brother Sir Thomas, who was in the retinue of the Earl of Warwick in the French wars. The fourth monument was probably that of another Sir Fulk Bermingham, who was master or warden of the Guild of St. Thomas, which fact accounted for the rather unusual robes he wore. The lecture was illustrated by lantern slides prepared from drawings by Miss Blake, of the School of Art.

#### GENERAL.

**The King** received Sir Edward Poynter (president) and Mr. F. A. Eaton (secretary) of the Royal Academy in audience on Monday, when His Majesty signed the diplomas of the recently elected Academicians.

**Mr. William Henry Barlow**, of High Combe, Old Charlton, president of the Institution of Civil Engineers in 1880, who died on November 12, has left estate valued at 68,014*l.* 17*s.* 11*d.* gross, including personally valued at 50,042*l.* 8*s.* 5*d.* He bequeathed, after the death of his widow, to the Institution of Civil Engineers his portrait by Mr. Collier.

**Four New Churches** are to be erected in Leicester at a total cost of 24,000*l.*

**A Report** has been prepared by the experts, MM. Bunel and Debric, architects, of the Paris Préfecture of Police; M. Girard, chief of the Municipal Laboratory; and M. Ogier, chief of the Laboratory of Toxicology, relating to the causes of the death of Emile Zola, the novelist. They have concluded that the cause of the suffocation arose from the defective condition of the chimney in the bedroom.

**William Morris's Home** "Red House," Bexley Heath, was sold this week at the Mart, Tokenhouse Yard, for 2,850*l.*

**The Imperial Academy of Art**, St. Petersburg, has appointed a committee to consider the project for the erection of a palace of art adapted for exhibition and which would cost about a million of roubles, exclusive of decoration.

**Dr. Walter de Gray Birch**, who was long at the head of the MSS. Department at the British Museum and for twenty-two years secretary of the British Archæological Association, has been appointed librarian and curator to the Marquis of Bute.

**Convocation** granted on Tuesday 100*l.* out of the Craven Fund to Arthur J. Evans, M.A., Fellow of Brasenose College, to assist him in continuing his researches in Crete.

**The Royal Society of British Artists** have resolved to add to the number of members who practise in water-colours. For this purpose a special election will be held on January 12. The names of candidates will be received up to January 3.

**An Extraordinary Meeting** of the members of the Royal Architectural Museum has been called for Friday next, the 19th inst., at 4 o'clock, Tufton Street, Westminster, to affix the Common Seal of the Royal Architectural Museum to an agreement between the Museum and the Architectural Association, and to appoint a liquidator. After the special business, presentations will be made to Mr. J. P. Seddon and Mr. Maurice B. Adams, in recognition of their services to the Royal Architectural Museum. Sir Wm. Emerson, president, will take the chair, and a good attendance is anticipated.

**M. Alexandre Bertrand** has died at the Château of St. Germain, of the museum in which he was the curator, at the age of eighty-three. His fame as an archæologist was world-wide. He was a pupil of the Ecole Normale who, in 1848, was appointed member of the school of Athens. He was one of the original founders of the museum of St. Germain, which contains the largest and most varied collections of objects illustrating the Celtic, Gallic, Gallo-Roman and Roman past of the nation which exist anywhere in the world. Ever since 1862 he has been its curator, and at the same time professor at the Ecole de Louvre of National Archæology. At the Academy of Inscriptions and Belles-Lettres he occupied the chair of Littre.

**The Bursley Park Estate**, in Hampshire, has been sold for 300,000*l.* It is expected that the mansion will be rebuilt at a cost of 60,000*l.*

**A Memorial** of bronze on red alabaster, containing a medallion portrait of King Alfred encircled with oak leaves, has been erected in the church of St. Nicholas Cole Abbey. Underneath is the inscription:—"Alfred the Great. Born 849, died 901," with the following words of the king:—"I desire to live worthily all my days, that after death I might leave to my successors a memory of good work done."



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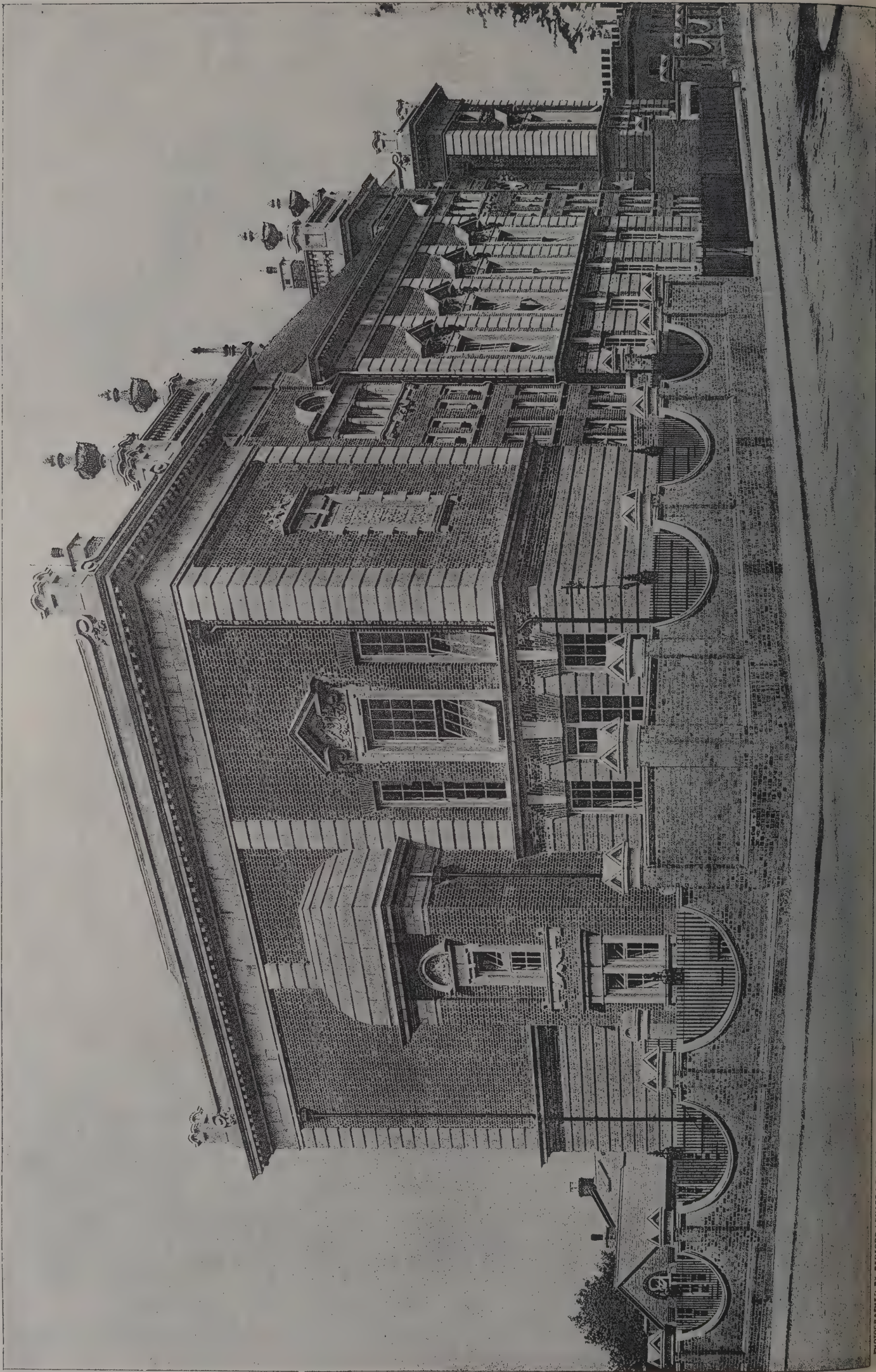
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The Architect, December 12, 1902.



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CATHEDRAL SERIES, No. 420.—HEREFORD: FOUR-LEAVED FLOWER ORNAMENT ON  
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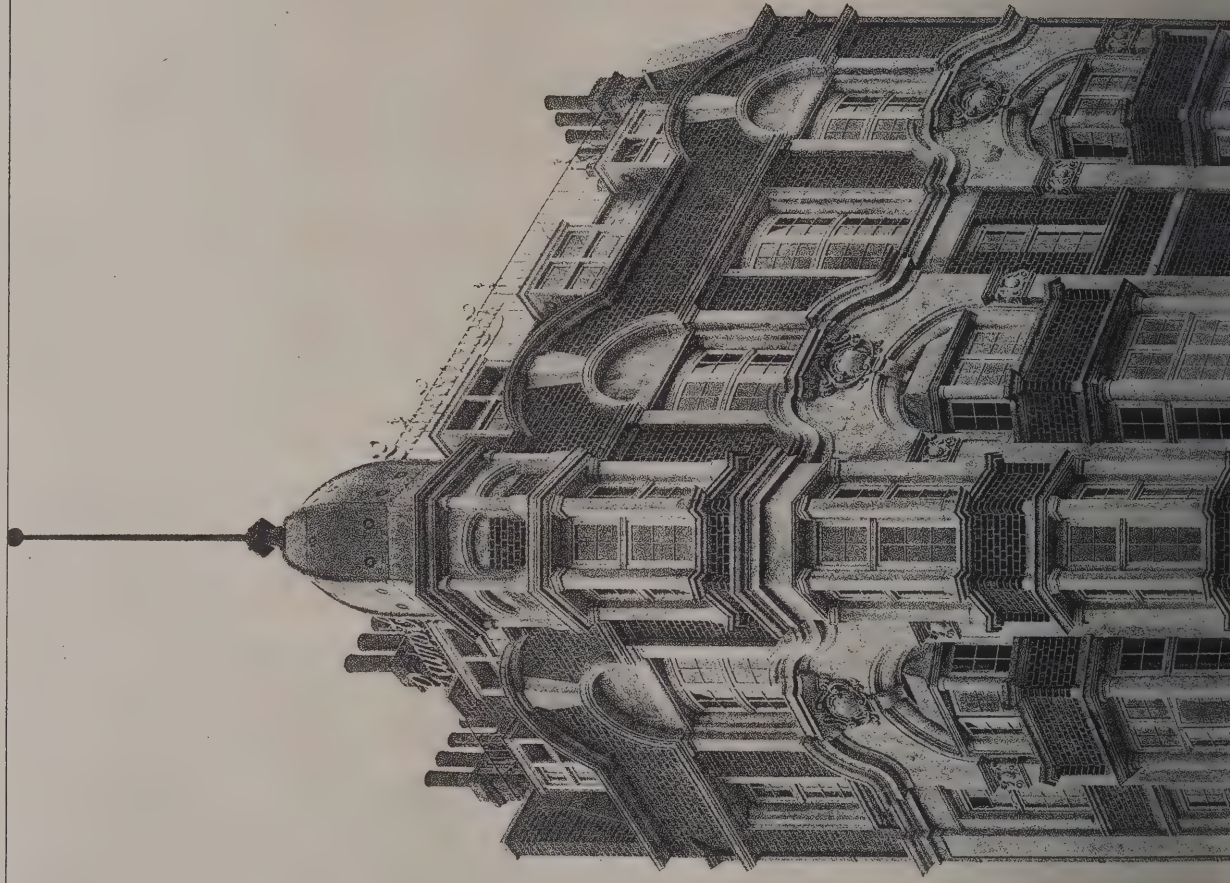
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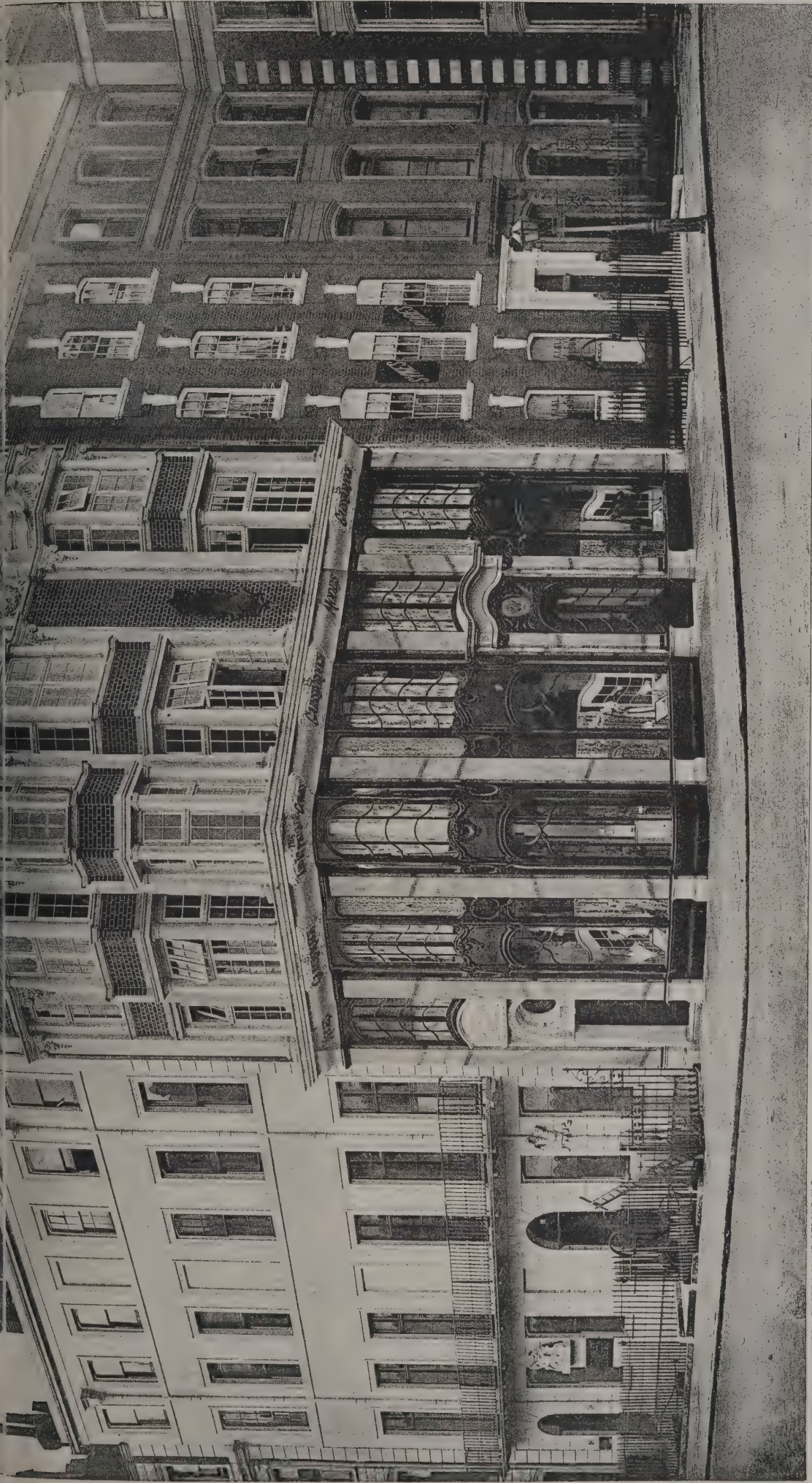
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H. M. WAKLEY, Architect.



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THE

## Architect and Contract Reporter.

## EDITORIAL NOTICES.

*In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

## TENDERS, ETC.

*As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

## COMPETITIONS OPEN.

**ASHTON-IN-MAKERFIELD.**—Dec. 31.—Designs, &c., are invited for the enlargement of the Infectious Diseases Hospital. The architect whose plans are accepted and approved will be retained by the Council to carry out the work at the usual professional charges. Plan of the hospital site, together with full particulars of the alterations and extensions required, may be obtained from Mr. T. Burgess, surveyor, at the Council Offices.

**BRIDGWATER.**—Feb. 28.—Plans, specifications and estimates are invited in competition for power and appliances to deal with the accumulations of silt in portions of the river Parrett. Mr. W. T. Baker, town clerk, King Square, Bridgewater.

**CAPE TOWN.**—Jan. 31.—The Council of the University of the Cape of Good Hope invite designs for the erection of university buildings. Premiums of 400*l.*, 200*l.* and 100*l.* will be awarded to the authors of the designs placed first, second and third respectively. Particulars of the competition may be obtained on application to the Registrar at Cape Town, or to the Agent-General in London.

**DURBAN (NATAL).**—Dec. 18.—Designs are invited for new town hall, library, museum, art gallery and municipal offices. Three premiums of 500*l.*, 300*l.* and 200*l.* respectively will be awarded for the three best designs in order of merit. Mr. W. H. Radford, C.E., Albion Chambers, Nottingham.

**HULL.**—Jan. 31.—Designs in competition are invited for the extension of the town hall. Premiums of 300*l.*, 200*l.* and 100*l.* are offered. Mr. E. Laverack, town clerk, Town Hall, Hull.

**KINGSTON-ON-THAMES.**—Jan. 15.—Plans and designs are invited for a central home and cottage homes for children of both sexes in the Kingston Road, in the parish of New Malden. A premium for the first three selected plans of 25*l.*, 15*l.* and 10*l.* respectively is offered. Mr. Jas. Edgell, clerk, Union Offices, Coombe Lane, Kingston-on-Thames.

**MOTHERWELL, N.B.**—Designs are invited for the erection of buildings suitable for a public library. Mr. James Burns, town clerk, Municipal Offices, Motherwell.

**ST. IVES, CORNWALL.**—Jan. 31.—Competitive plans are invited for the erection of municipal buildings, to consist of a guildhall, council-chamber, jury room, public hall, town clerk's office, surveyor's office, treasurer's office, muniment room, parochial office, mayor's parlour and fire-brigade station and offices. Premiums of 70*l.* and 30*l.* respectively will be awarded to the architects whose plans and specifications are considered to be first and second in order of merit. Mr. Edward Boase, town clerk, Town Clerk's Office, St Ives, Cornwall.

**SCOTLAND.**—Competitive designs are invited in connection with the erection of a new poorhouse at Motherwell. Premiums of 25*l.*, 20*l.* and 15*l.* are offered for selected plans. Mr. John Miller, Inspector of Poor, Parish Council Office, Motherwell.

**SURBITON.**—Dec. 16.—Designs are invited for erection of a Coronation memorial clock tower near the refuge in the area fronting Surbiton station. Premium 10*l.* 10*s.* Dr Coleman, chairman, clock committee District Council Offices, Surbiton.

## CONTRACTS OPEN.

**ALSTON.**—Dec. 17.—For erection of a vicarage at Nenthead, near Alston. Messrs. Hicks & Charwood, architects, 67 Westgate Road, Newcastle-upon-Tyne.

**AUSTRALIA.**—Dec. 22.—For erection at Perth, Australia, of a rubbish destructor capable of dealing with forty tons of garbage in eight hours. Mr. W. E. Bold, town clerk, Town Hall, Perth.

**BEXHILL.**—Dec. 15.—For extension of engine-room, boiler-house and offices at the electric light works, for the Town Council. Mr. George Ball, borough surveyor, Town Hall, Bexhill.

**BLACKPOOL.**—Dec. 18.—For erection of a branch police station at Hawes Side. Mr. John S. Brodie, borough surveyor, Town Hall, Blackpool.

**BRADFORD.**—Dec. 17.—For following alterations, viz (1) workmen's rooms, Hammerton Street destructor, (2) municipal milkshop, Manchester Road. Mr. F. Stevens, town clerk, Town Hall, Bradford.

**BRIGHTON.**—Dec. 23.—For the construction of the permanent way of the tram roads in London Road, St. Peter's Place, York Place, Pavilion Parade, and Old Steine, &c, including the bonding and all contingent works, and paving with wood the whole of the area of such roads, including the tramway tracks. Mr. Francis J. C. May, surveyor, Town Hall, Brighton.

**CANNOCK.**—Dec. 17.—For whole of the works required in connection with new system of drainage for the Union Workhouse, including about 2,800 yards of stoneware pipe drains. Messrs. Willcox & Raikes, engineers, Union Chambers, 63 Temple Row, Birmingham.

**CHISWICK.**—For erection of a wall at the sewage disposal works. Mr. John Barclay, surveyor, Town Hall, Chiswick.

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**DARLINGTON.**—Dec. 15.—For erection of an ornamental bandstand (exclusive of base) at North Lodge park. Mr. W. George Winter, borough surveyor, Town Hall.

**DOVERCOURT.**—Dec. 19.—For erection of an underground convenience in Stour Road, Dovercourt. Mr. Henry Ditcham, borough surveyor, 7 West Street, Harwich.

**DUDLEY.**—Dec. 15.—For additions to the technical schools, Stafford Street, Dudley, and an underground convenience at the Market Place, Netherton. Mr. John Gammage, borough surveyor, Town Hall, Dudley.

**DURHAM.**—Jan. 5.—For erection of new Board schools at Heworth. Mr. H. Miller, architect, Felling.

**ESSEX.**—Jan. 7.—For erection of the Carnegie free library at Grays, Essex, and for furnishing, lighting and heating the same. Mr. Christopher M. Shiner, architect, 6, 7 and 8 Crutched Friars, E.C.

**GLOUCESTER.**—Dec. 20.—For alterations and additions to the Tuffley Board school, Gloucester. Mr. Walter B. Wood, architect, 12 Queen Street, Gloucester.

**GREAT AYTON.**—Dec. 29.—For erection of proposed new police-station, &c., at Great Ayton, Yorks. Mr. Walter H. Brierley, county architect, 13 Lendal, York.

**HALIFAX.**—Dec. 15.—For erection of an extensive block of high-class shops, showrooms, workrooms, &c., in Commercial Street, Halifax. Mr. W. Clement Williams, architect, 29 Southgate, Halifax.

**HALIFAX.**—Dec. 18.—For erection of nineteen houses at High Road Well. Mr. Medley Hall, architect, 29 Northgate, Halifax.

**HASTINGS.**—Dec. 22.—For alterations and additions to the public convenience, Mercer's Bank, Rock-a-Nore, Hastings. Mr. B. F. Meadows, town clerk, Town Hall, Hastings.

**HERNE BAY.**—Dec. 17.—For erection of pavilion, bandstand, reading-rooms, lavatories, &c., at East Cliff, Herne Bay. Mr. Edward White, clerk, Urban District Council Offices, Town Hall, Herne Bay.

**HIGH HARRINGTON.**—Dec. 15.—For erection of a dwelling-house at High Harrington, Cumberland. Mr. Charles W. Eaglesfield, architect, Gordon Street, Workington.

**HUDDERSFIELD.**—Dec. 17.—For erection of a Wesleyan church at Longwood. Mr. J. Berry, architect, 3 Market Place, Huddersfield.

**HULL.**—Dec. 19.—For alterations and additions to the isolation block at the sanatorium, Hedon Road. Mr. Joseph H. Hirst, city architect, Town Hall, Hull.

**HULL.**—Dec. 31.—For erection of thirty-four artisans' dwellings in Rustenburgh Street. Mr. Joseph H. Hirst, city architect, Town Hall, Hull.

**IRELAND.**—Dec. 15.—For the erection of a warehouse at Franklin Street, Belfast. Mr. Henry Seaver, architect, 126 Royal Avenue, Belfast.

**IRELAND.**—Dec. 16.—For erecting an ornamental wooden shelter in the Esplanade, Bangor, county Down. Mr. J. Milliken, clerk, Town Hall, Bangor.

**IRELAND.**—Jan. 1.—For erection of priest's house at Glenville, co. Cork. Mr. Samuel F. Hynes, architect, 21 South Mall, Cork.

**IRELAND.**—Jan. 6.—For erection of cottages in the various townlands of Strabane. Mr. J. E. Sharkie, clerk, District Council Offices, Strabane.

**IRELAND.**—Dec. 23.—For erection of a new Crown post-office at Limerick. Particulars may be obtained at the Office of Public Works, Dublin.

**LEEDS.**—For alterations to and partial rebuilding of warehouses, shops and offices in Park Lane, Leeds; tendering for the drainer, bricklayer, mason and concrete, carpenter and joiner, plasterer, plumber and glazier, slater and painterwork required. Messrs. Mosleys, rent collectors, 6 Wormald Row.

**LEWISHAM.**—Dec. 15.—For providing and erecting a fire-escape staircase at the union workhouse. Mr. H. C. Mott, clerk to the Guardians, 286 High Street, Lewisham, S.E.

**LEYTONSTONE.**—Jan. 5.—For erection of Norlington Road schools, Leytonstone, Essex. Mr. William Jacques, architect, 2 Fen Court, Fenchurch Street, E.C.

**LONDON.**—Dec. 15.—For erection of a blacksmith's shop, &c., at the Wandsworth Borough Council's wharf, Ashlone Road, Putney Embankment. Particulars may be obtained at the Surveyor's Office, 4 High Street, Wandsworth.

**LOWESTOFT.**—Dec. 15.—For construction of seven groynes and the lengthening of the four existing groynes upon the South Beach at Lowestoft, Suffolk. Mr. W. T. Douglass, 15 Victoria Street, Westminster, S.W.

**MALDON.**—Dec. 17.—For erection of a ward block of 10 beds, administrative block and other buildings in connection

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therewith, at Maldon, Essex. Mr. P. M. Beaumont, architect, Maldon, Essex.

MANSFIELD.—Dec. 19.—For erection of two cottages at the pumping station at Rainworth. Mr. John Harrop White, town clerk, Town Hall, Mansfield.

MORLEY.—Dec. 18.—For repairs to various properties at the sewage works estate. Mr. W. E. Putman, borough surveyor, Town Hall, Morley.

NORTHWICH.—Jan. 6.—For extension of the Victoria Infirmary, Northwich, consisting of ward accommodation for twenty-two beds, operating theatre and other offices. Mr. J. Holland, architect, Hayhurst Street, Northwich.

PINXTON (near Alfreton).—Dec. 17.—For sewerage and sewage purification works, comprising 3,762 lineal yards of 6-inch, 9-inch and 12-inch stoneware pipe sewers, and 160 lineal yards of 9-inch and 12-inch cast-iron pipe sewers, together with manholes, ventilators, flushing chambers, engine-house, storage wells, lateral and percolating filters, &c., in connection therewith. Mr. Herbert Walker, engineer, Albion Chambers, King Street, Nottingham.

RHODESIA.—Feb. 26.—For establishment and working of an electric tramway system, Bulawayo. Messrs. Davis & Soper, 54 St. Mary Axe, London, E.C.

SALE.—Dec. 30.—For street works in the following roads:—Baxter Road, tar macadam; Oldfield Road, ordinary macadam; Lynwood Grove, ordinary macadam; Stanley Grove, sett paving. Mr. W. Holt, surveyor, Council Offices, Sale.

SCOTLAND.—Dec. 16.—For erection of miners' houses in Pittenweem. Particulars at the Town Clerk's Office, Pittenweem.

SCOTLAND.—Dec. 19.—For additions and repairs to Tyrie parish church. Mr. William Reid, architect, Saltoun Square, Fraserburgh.

SCOTLAND.—Dec. 23.—For erection of the Anderston district library, Glasgow. Messrs. Stewart & Paterson, architects, 143 West Regent Street, Glasgow.

SOUTH ACTON.—Dec. 18.—For erection of boys' school to accommodate 720 scholars, with manual centre, caretaker's house, &c., in Osborne Road, South Acton, W. Messrs. Edward Monson & Sons, architects, Grosvenor House, Acton Vale, W.

SOUTHAMPTON.—Dec. 17.—For enclosing corridor arches at the Incorporation Infirmary, Shirley Warren, Southampton. Messrs. Mitchell, Son & Gutteridge, architects, Portland Street, Southampton.

SOUTHPORT.—Dec. 15.—For supply and delivery of about 91 tons of cast-iron pipes, 3 inches and 4 inches in diameter. Mr. G. H. Abbott, resident engineer, Portland Street, Southport.

STOKE-UPON-TRENT.—Dec. 17.—For painting and other work required at the cottage homes at Penkull. Mr. C. Lynam, architect, 6 Wolfe Street, Stoke-upon-Trent.

TEIGNMOUTH.—Jan. 6.—For extensions and alterations at the gasworks. Mr. J. Alex. Gray, gas engineer, Teignmouth.

TOTTENHAM.—Dec. 16.—For supply of about 267 yards of 16-inch, about 950 yards of 6-inch, about 600 yards of 4-inch iron pipes with collars and branches, &c., as per specification. Mr. W. H. Prescott, engineer, Coombes Croft House, 712 High Road, Tottenham.

TROWBRIDGE.—Jan. 5.—For erection of an isolation hospital for thirty patients at Trowbridge, Wilts. Mr. J. Hugh Goodman, architect, Town Hall Chambers, Reading.

UXBRIDGE.—Dec. 22.—For erection of a bathroom, with hot and cold water services and fittings, and other works at the isolation hospital, Kingston Lane, Hillingdon East. Mr. Bertram Freeman, surveyor, Swiss Cottage, Chiltern View Road, Uxbridge.

WALES.—For alterations and additions to Glanadda infants' school, Bangor. Mr. Harold Hughes, architect, Bangor.

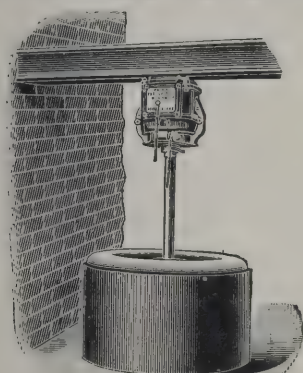
WALES.—Dec. 15.—For erection of a shop and dwelling-house at Gilwern, near Abergavenny. Mr. B. J. Francis, architect, Abergavenny.

WALES.—Dec. 15.—For adding a third lift (100 feet diameter by 24 feet deep) to the present two-lift holder at the Treforest, Pontypridd, gasworks. Mr. Edward Jones, engineer, Treforest.

WALES.—Dec. 16.—For erection of a new infants' school vice the present Ynyscedwyn infants' school, on a field near the rectory, Ystradgynlais, to accommodate about 180 scholars. Mr. Philip Williams, architect, Ty'r Gorof, Ystradgynlais.

WALES.—Dec. 17.—For additions to Dock Road Brewery, Newport, Mon. Mr. F. Phillips, Dock Road Chambers, Newport.

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**WALES.**—Dec. 18.—For erection of offices at the harbour, Swansea. Mr. Talfourd Strick, clerk, Harbour Office, Swansea.

**WALES.**—Dec. 18.—For erection of a villa residence on the Llest Estate, Llantwit-Fardre. Messrs Thomas & Cule, architects, Town Hall Chambers, Pontypridd.

**WALES.**—Dec. 18.—For erection of business premises in Alexandra Road and new stables to Commercial hotel, Aberystwyth. Mr. T. E. Morgan, architect, Aberystwyth.

**WALES.**—Dec. 20.—For erection of a master's house and gymnasium at Radyr schools, Radyr. Mr. Arthur O. Evans, architect, Pontypridd.

**WALES.**—Dec. 28.—For erection of twenty-five houses at Pengam. Mr. David Williams, Board schools, Pengam.

**WALES.**—Dec. 31.—For erection of new business premises at the corner of Alexandra Road and Terrace Road (opposite the railway station), Aberystwyth. Mr. J. Arthur Jones, architect, 7, Queen's Terrace, Aberystwyth.

**WALES.**—Jan. 5.—For erection of ninety-five cottages at Aber, near Caerphilly. Mr. E. Thomas, 19 Eirw Road, Porth.

**WALES.**—Jan. 5.—For erection of ninety-five cottages at Abertridwr, near Caerphilly. Mr. Edmund Thomas, 19 Eirw Road, Porth, Pontypridd.

**WANDSWORTH.**—Dec. 15.—For erection of a blacksmith's shop, &c., at the Council's wharf, Ashlone Road, Putney Embankment. Particulars may be obtained at the Surveyor's office, 41 High Street.

**WATER FULFORD.**—Dec. 31.—For erection of a lunatic asylum at Water Fulford, near the city of York. Mr. A. Creer, architect, Guildhall, York.

**WHITEHAVEN.**—Dec. 16.—For erection of a battery-room and office at the electricity station, West Strand. Mr. Thos. Brown, town clerk, Town Hall, Whitehaven.

**WIGAN.**—Dec. 27.—For erection of fourteen cottages in Ellis Street and eleven in Eckersley Street, off Whalley. Mr. Harold Jevons, town clerk, Municipal Buildings, Wigan.

**WOOLWICH.**—Dec. 17.—For alterations at the mortuary and post-mortem room at the union infirmary, Plumstead. Mr. J. O. Cook, architect, Eleanor Road, Woolwich.

**YORK.**—Dec. 31.—For erection of a lunatic asylum at Water Fulford, near the city of York. Mr. A. Creer, architect, Guildhall, York.

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Exors. of the late W. F. Chadwick, 19 Leeds Street, Liverpool—Patten Street, £245 12s.; Hope Terrace, £61 5s. C. L. Warren, St. Paul's Road, Seacombe—Upper Brassey Street, £1,068 14s. 6d.

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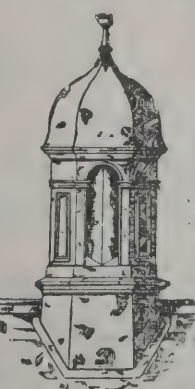
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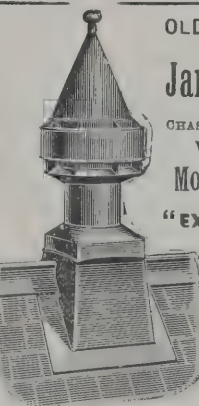
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W. Hornett . . . . .	138	0	0
J. R. SIMS (accepted) . . . . .	96	10	0

## Lombard Wall.

Johnson & Co. . . . .	£260	0	0
E. Proctor . . . . .	230	0	0
Holliday & Greenwood, Ltd. . . . .	227	0	0
W. Hayter & Son . . . . .	187	0	0
W. Banks . . . . .	185	0	0
W. J. Howie . . . . .	176	0	0
H. Groves . . . . .	160	0	0
S. MUSGROVE (accepted) . . . . .	143	2	0

## Abbey Street.

T. S. Elkington & Sons . . . . .	£220	10	0
Viney & Stone . . . . .	190	0	0
J. Haydon & Sons . . . . .	134	0	0
W. Silk & Son . . . . .	126	0	0
G. Barker . . . . .	124	0	0
G. WALES (accepted) . . . . .	116	0	0

## Scrutton Street.

Belcher & Co., Ltd. . . . .	£259	17	6
J. Haydon & Sons . . . . .	162	10	0
Stevens Bros. . . . .	159	10	0
Corfield & Co. . . . .	143	10	0
PARROTT & ISOM (accepted) . . . . .	85	0	0

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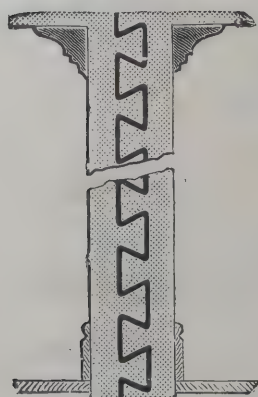
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Curtain Road.		
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Viney & Stone	165	0 0
Johnson & Co.	162	10 0
Stevens Bros.	158	10 0
J. F. Holliday	150	0 0
G. Barker	149	0 0
Gavin Bros.	145	0 0
PARROTT & ISOM (accepted)	99	0 0
Gayhurst Road.		
J. Stewart	£299	16 0
C. Willmott & Son	231	15 0
W. Shurmur & Sons, Ltd.	230	0 0
W. Silk & Son	213	0 0
Barrett & Power	204	0 0
G. Wales	199	0 0
G. Barker	194	0 0
CORFIELD & Co. (accepted)	179	10 0
Adys Road.		
J. Harries & Co.	£446	0 0
W. J. Mitchell & Son	368	0 0
H. Line	366	0 0
J. & C. Bowyer	294	0 0
W. V. Goad	292	0 0
W. Sayer & Son	280	10 0
A. Black & Son	276	0 0
Maxwell Bros., Ltd.	243	0 0
RICE & SON (accepted)	231	0 0
Camden Street (special) and Medburn Street (junior boys).		
C & W. Hunnings	£126	0 0
H. Wall & Co.	121	0 0
Marchant & Hirst	110	0 0
T. Cruwys	109	0 0
STEVENS BROS. (accepted)	99	10 0
Basnett Road.		
General Builders, Ltd.	£193	0 0
Martin, Wells & Co., Ltd.	191	0 0
E. B. Tucker	163	0 0
R. S. Ronald	160	0 0
E. Flood	155	0 0
E. P. Bulled & Co.	146	0 0
C. GURLING (accepted)	145	0 0

LONDON SCHOOL BOARD—continued.

Bellenden Road.		
A. Black & Son	£297	0 0
Rice & Son	289	0 0
H. Line	276	0 0
W. J. Howie	269	0 0
J. & C. Bowyer	267	0 0
W. Sayer & Son	252	0 0
J. F. Ford	241	0 0
Maxwell Bros., Ltd.	229	0 0
W. HOOPER (accepted)	215	0 0
Peckham Park.		
J. Harries & Co.	£387	0 0
H. Line	323	0 0
A. Black & Son	301	0 0
W. J. Howie	291	0 0
Rice & Son	285	0 0
E. Triggs	259	0 0
W. Hooper	252	0 0
W. SAYER & SON (accepted)	230	0 0
Sussex Road.		
Lathey Bros.	£262	0 0
Rice & Son	243	0 0
J. Garrett & Son	229	0 0
Holliday & Greenwood, Ltd.	228	0 0
H. & G. Mallett	222	10 0
E. Triggs	222	0 0
Maxwell Bros., Ltd.	219	0 0
W. READ (accepted)	197	0 0
Laxon Street.		
Lathey Bros.	£322	0 0
H. J. Williams	314	10 0
J. Harries & Co.	287	0 0
W. Sayer & Sons	259	0 0
J. GREENWOOD (accepted)	246	17 6
Princess Road.		
T. Cruwys	£294	0 0
Thompson & Beveridge	197	0 0
Holloway Bros. (London), Ltd.	195	0 0
W. Densham & Sons	178	10 0
W. CHAPPELL (accepted)	158	10 0

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## NETHERNE.

For foundations of a road about 1,600 yards long on the asylum estate at Netherne, near Coulsdon. Mr. GEORGE T. HINE, architect, 35 Parliament Street, Westminster.

Streeter Bros.	£4,383	4	2
H. Willcock & Co	4,280	3	4
Lawrence & Thacker	4,154	15	0
W. Adamson	3,975	3	4
E. Parry & Co.	3,844	0	0
C. Mott & Sons	3,622	17	11
A. C. Soan	3,533	4	10
W. Cunliffe	3,391	2	6
W. L. Meredith & Co., Ltd.	3,380	0	0
J. G. Pickard	3,319	0	0
E. Iles	3,246	0	0
E. B. Yewen	3,173	11	8
T. Adams	3,111	16	8
J. & T. Binns	3,111	3	4
J. Meston	3,076	15	10
C. Ford	2,955	0	0
J. May	2,900	0	0
J. T. Trueman	2,882	0	0
D. H. Porter	2,849	0	0
S. KAVANAGH & Co, Surbiton Hill (accepted)	2,763	1	8
Practical Landscape Gardening and Estate Development Co.	2,642	10	10
Practical Landscape Gardening and Estate Development Co., chalk	2,162	10	10

## NORTH SHIELDS.

For extension of the Queen Victoria schools, Coach Lane, North Shields. Messrs. MARSHALL & TWEEDY, architects, 17 Eldon Square, Newcastle-on-Tyne.

T. PATTERSON, Whitley Bay (accepted). £7,769 0 0

## SCOTLAND.

For street works in Erskine Street, Aberdeen. Mr. WILLIAM DYACK, burgh surveyor.

J. MCADAM & SONS, 47-49 Charlotte Street (accepted). £373 9 7

For providing and laying about 3,200 yards of 4-inch and 6-inch cast-iron pipes, for the Grangemouth Town Council Messrs. A & W. BLACK, engineers, Falkirk.

J. BRYCE, West Lochgreen, Bonnybridge (accepted). £1,109 14 6

## REIGATE.

For sewerage works in Horley, in the county of Surrey, for the purpose of the extension of the main drainage of the district. Messrs. JOHN TAYLOR, SONS & SANTO CRIMP, engineers, 27 Great George Street, Westminster.

M. S. Kitteringham	£4,715	17	6
J. & T. Binns	3,715	2	6
A. G. Osenton	3,715	0	0
Haslemere Builders, Ltd.	3,485	10	0
Turnbull & Co.	3,414	7	0
E. Iles	3,250	0	0
F. W. Trimm	3,067	0	0
J. S. Pickard	2,992	0	0
J. Meston	2,849	11	0
H. Robert	2,767	2	0
G. R. Mann	2,698	17	3
Johnson & Langley	2,694	17	10
G. Bell	2,598	0	0
C. Ford	2,558	0	0
G. G. Rayner	2,518	15	11
STREETERS & TODHUNTER, Goldalming (accepted)	2,465	0	0

## SEVENOAKS.

For widening and fencing Halstead Station Road.

W. BOWEN, Halstead, £147 1cs. and £47 1os. (accepted).

## SOUTHWICK.

For sewerage and street works in Victoria Road and a part of Cross Road, Southwick, Sussex. Mr. GEORGE WALTER WARR, surveyor.

H. A. Chambers	£2,145	0	0
J. & T. Binns	1,572	0	0
J. Meston	1,492	0	0
J. WHITTINGTON, Southwick (accepted)	1,499	0	0

## SOYLAND.

For erection of a mason's wall about 200 yards long and 5 feet high from the surface of the road, at Blackhouse reservoir. Mr. JOHN WADSWORTH, surveyor, Ripponden.

I. SMITH, Lower Shaw, Ripponden £1 3s. per pole (accepted).  
A. UTTLEY, Moor Farm, Ripponden, railing fixing, 2½d. per yard (accepted).

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W. B. WINCHCOMBE, Wroughton (accepted) . £11,416 8 0

TUNBRIDGE WELLS.

For alterations and additions to the accountant's offices at the town-hall buildings. Mr. W. H. MAXWELL, borough surveyor.

Martin & Co. . . . . £460 0 0

Laney & Sons . . . . . 443 0 0

Goodwin Bros. . . . . 375 10 0

J. N. Jeffery . . . . . 371 13 0

Funnell Bros. . . . . 359 0 0

J. Smith . . . . . 343 13 0

T. BATES, 6 Nevill Terrace, Montacute Road, Tunbridge Wells (accepted) . . . . . 338 0 0

WALES.

For sewerage works at Libanus Road, Ebbw Vale, Mon. Mr. T. J. THOMAS, town surveyor.

W. BROWN, Merthyr Tydfil (accepted) . . . . £40 0 0

For renewals and repairs to the engines and boilers at the Cogan pumping station, Cardiff.

TYNESIDE ENGINE WORKS, LTD., Cardiff (accepted) . . . . . £190 0 0

WALMER.

For sewerage works in Granville Road, Walmer, Kent. Mr. HERBERT W. BARKER, surveyor.

A. C. Soan . . . . . £425 0 0

G. H. Denne & Son . . . . . 373 0 0

S. & R. Jefford . . . . . 340 5 0

J. Mills . . . . . 327 6 6

Turner & Co. . . . . 324 0 0

W. Wilson . . . . . 313 0 0

J. E. TURNER, Walmer (accepted) . . . . . 300 0 0

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For construction of a 23 feet 6 inch girder bridge.

DUPONT & Co., Derby Road (accepted) . . . £642 19 7

WEST BROMWICH.

For alterations and additions to the Volunteer drill hall.

SMITH & SON, West Bromwich (accepted) . . £875 0 0

WEST HARTLEPOOL.

For sewerage work in Mainsforth Terrace. Mr. J. W. BROWN, borough engineer.

J. BURN, West Hartlepool (accepted).

For papering and painting the municipal buildings. Mr. J. W. BROWN, borough engineer.

T. W. STOKELL, West Hartlepool (accepted).

For street works in Park Road and on the south side of Grange Road. Mr. JOHN BROWN, borough engineer.

J. BURN, West Hartlepool (accepted).

For supply and fixing complete of about 130 yards of creosoted, close-boarded post-and-rail undressed fence at the Chester Road allotments. Mr. J. W. BROWN, borough engineer.

F. ALDER, West Hartlepool (accepted).

YORK.

For sewerage and street works in Harrison Street, Heworth, and Newby Terrace, Wigginton Road. Mr. A. CREER, city engineer.

T. LANE (accepted) . . . . . £245 2 0

Received too late for Classification.

CROYDON.

For erection of a pair of houses at Eden Road, Croydon. Mr. FRANK WINDSOR, architect and surveyor, Bank Buildings, 1 High Street, Croydon.

Bulled & Co. . . . . £1,627 0 0

F. Knight, jun. . . . . 1,500 0 0

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W. Potter . . . . . 1,390 0 0

W. E. Barnes . . . . . 1,350 0 0

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E. J. SAUNDERS (accepted) . . . . . 1,300 0 0

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**CONTRACT OPEN.**

CHELSEA.—Dec. 17.—For pulling-down certain buildings numbered 143 to 165 (odd), Sydney Street; and Nos. 244 to 248 (even), King's Road, Chelsea, with their appurtenances, and clearing away the materials and debris from the site, and for the erection of hoardings around the site. Mr. Joshua Dowl- ing, Clerk to the Guardians, Guardians' Offices, 250 King's Road, Chelsea, S.W.

**ELECTRIC NOTES.**

MR. JAMES A. ROBERTSON, chief electrical engineer with Messrs. Denny Brothers, Dumbarton, has been appointed electrical engineer for Greenock, at a salary of 250*l.* per annum.

AT last week's meeting of Dundee Town Council, it was reported that Mr. W. H. Tittensor, electrical engineer, had been offered the appointment of electrical engineer of Preston. Ex-Provost Brownlee stated that he had advised Mr. Tittensor to delay accepting till the Town Council had an opportunity of saying whether they would raise his salary, and he moved that his salary be raised from 400*l.* to 500*l.* On objection being taken by a member to this, Mr. Tittensor approached ex-Provost Brownlee and had a conversation with him, and the latter, rising, said he had just been informed by Mr. Tittensor that he had felt honourably bound to accept the Preston appointment. It was agreed to take steps to appoint a new engineer for Dundee.

**TRADE NOTES.**

ALL SAINTS CHURCH, Lockerbie, N.B., is being fitted with their "small tube" hot-water heating apparatus by Messrs John King, Ltd, engineers, Liverpool, employing their latest improved economical coil heater.

THE Selby Urban District Council have given instructions to Messrs. Wm. Potts & Sons, clock manufacturers, Guildford Street, Leeds, to fix a large size Cambridge quarter chime clock with four large external dials in the tower of Selby Abbey.

THE tender of the Columbian Fireproofing Company, Ltd., 37 King William Street, E.C., has been accepted by the Lancashire and Yorkshire Railway for fireproof floors at their new offices, Nos. 10, 11 and 12 Great College Street, West-

minster, and they have just completed their work at the New Medical Schools, Cambridge, for Mr. E. S. Prior, M.A., of 3 Old Serjeants' Inn, Chancery Lane, E.C.

THE London Fireproof Plate Wall Company, Ltd., inform us that they have secured under tender the contract for the whole of the divisional partitions for workmen's dwellings in Regency Street, Westminster, for the Westminster City Council. They were in competition with several other firms, but the housing committee recommended their manufacture. Messrs John Mowlem & Co. are the contractors. The same company are also erecting their partitions in the four large blocks of artisans' dwellings now in course of completion at High Street, Stoke Newington, the property of the Four per Cent. Dwellings Company, for which Messrs. Dove Bros. are the contractors.

**VARIETIES.**

A NEW Board school is being built at Leytonstone; the architect is Mr. Jacques, of Fen Court, Gracechurch Street, London.

MR. SHINER, of Crutched Friars, London, E.C., is the architect for the new Carnegie free library about to be erected at Grays, in Essex.

MR. HENRY GILMAN, the energetic and successful manager of the Crystal Palace, died at his residence at Upper Norwood on the 3rd inst. He will be greatly missed by the personnel of the Palace, amongst whom he was very popular.

THE Chancery Lane Safe Deposit Company have for the fifth time during the last ten years added an extensive annexe to their immense area of safes and strong rooms, which are, we believe, the largest in the world.

THE Mayor of Sheffield in his speech on the occasion of his elevation to the civic chair, incidentally remarked that those who were interested in archaeology and antiquarian matters would realise that the acquisition by the Corporation of the old half-timbered house in Tenant Street as auxiliary offices would insure its being carefully preserved as a relic of days gone by. The house in question, formerly in the possession of the late town clerk, is the quaintest bit of Old Derby yet remaining intact. It was probably built in the "spacious times" of Queen Elizabeth, say about 1483. The house is but little known to Derby people, and when first seen has a somewhat startling effect, for there is nothing in the structure fronting the street to give a clue to the highly-picturesque

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building behind. A single step seems to take you from the atmosphere of the twentieth to that of the fifteenth century.

THE new burgh school at Rutherglen, N.B., was formally opened by Colonel J. M. Denny, M.P. for the Kilmarnock burghs, on the 6th inst. The new building takes the place of a former school, which was removed on account of its want of accommodation for the increased number of pupils attending it. The present edifice will give accommodation for 1,000 pupils, and has cost 13,000*l*. The style of the building is a simple treatment of English Renaissance. The elevation to King Street has two gables, with large flat oriels terminated with scroll pediment. On the front to King Street are the principal entrances used for infants. Here are also the playgrounds and latrines for boys and girls. There are two large gateways for boys and girls respectively. The north front is very imposing, showing the staircase windows going up with arched tops with two tower-like parts on each side. At this frontage are the entrances for the boys and girls of the higher standards from High Street. The plan of the school has a large central hall, with classrooms on either side. The infants are on the ground floor, and the higher standards on the two upper flats. The masters' and assistants' rooms are on the ground floor, near the entrances to the school. There are ample cloak-rooms, both for infants and the higher standards. The cooking-room and the chemistry-room are on the upper flat, with kitchen attached. The school is well lighted, the hall having a roof-light the whole length.

ALL SAINTS CHURCH, Claverley, six miles from Bridgnorth, was reopened for divine worship on Sunday, the 7th inst.

The restoration has been carried out in accordance with the plans of Mr. W. Wood Bethell, and the estimate of the architect was 4,500*l*. The work included the necessary repairs to roofs and walls, the lowering of the floor to its original level, and so unearthing the bases of the Norman columns, the removal of the galleries and thereby restoring the fine proportions of the nave. The plaster and whitewash have been taken from the walls, and this led to the discovery of some rare examples of Norman art. They are of unique interest on account of their exceptionally early date (1170), and the principal subject represented. This is an incident in the battle of Senlac or Hastings. The incident, evidently intended as the motif of the painting, suggested to the vicar of Claverley (the Rev. T. W. Harvey) a clue to the meaning of the whole, namely, that the painting is a pictorial representation of the personal encounter recorded in the "Roman de Rou" between Roger de Montgomery and a gigantic Englishman, captain of 100 men. To account for its existence upon the walls of this church it must be remembered that Earl Roger was the builder of the church and the founder of the chapter of canons associated with it, and also that by the ruling caste and their clergy the Norman Conquest had been invested with a semi-religious halo; it had not only been solemnly blessed by the Pope, but had received the sanction of success. The other paintings in the spandrels of the arcade and elsewhere are of a more ordinary character—the incidents in the lives of saints, the torments of hell, and figures of the seraphim, &c. The borderings throughout are of a very elaborate character, red, yellow and pink being the colours principally used.

## BUILDING AND BUILDERS.

THE Australian Government has accepted a tender for the construction of an outer harbour at Port Adelaide. The cost will be nearly half a million.

THE Malvern District Council has decided to acquire additional land near the old gasworks at a cost of 1,200*l*. The Council appointed a committee to prepare a scheme for the erection and working of a public library.

A SCHEME for the enlargement of the public baths has been adopted by the Gainsborough Urban Council. A swimming bath, 71½ feet long and 20 feet wide, will be provided, the cost of the additional length being estimated at 800*l*.

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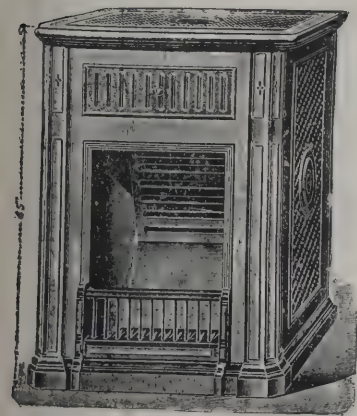
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THE Aston School Board have appointed Messrs. Cossins, Peacock & Bewlay, of Birmingham, as architects for the new schools in Fentham Road, the cost of which is estimated at 4,700*l*.

THE Birkenhead Board of Education have conditionally approved the plans submitted by the School Board for the erection of a higher elementary school in Conway Street, adjacent to the General Post Office, for the accommodation of 330 boys and 350 girls.

THE foundation-stone of a new Independent Methodist church at High Park, Southport, has been laid. The new building, situated in Old Park Lane, will be built at a cost of 1,400*l*, and take the place of a small structure facing High Park Road, built twenty-two years ago.

A LOCAL Government Board inquiry has recently been held into the application of the Town Council to borrow 2,273*l*. for purposes of street improvement, 100*l*. for the construction of a footbridge over the Colne near Middle Mill, and 11,693*l*. for defraying the balance of the cost of the town hall.

At a meeting of the Ayr School Board the clerk (Mr. John Douglas) reported that the Department had approved of the plans for the new school prepared by Mr John Eaglesham, Ayr. It was decided that the new school should be known as New Park school.

SINCE the scheme for building a new workhouse at Evesham was defeated the expenditure of large sums in additions and improvements to the old buildings has been agreed to. A new infirmary has been erected, and at the last meeting of the Board of Guardians estimates for new tramp wards and offices amounting to 4,500*l*. were submitted.

THE Swinton and Pendlebury District Council are considering the adoption of a scheme for dealing with the sewage of the district, which will involve an expenditure of close upon 10,000*l*. The Salford Corporation's new cemetery is in the neighbourhood, and there is a likelihood of new works being built there.

THE Manchester Council has sanctioned the contribution from the city of 3,200*l*. towards the cost of rebuilding the Blackley Reformatory. The total cost of the rebuilding will amount to 19,000*l*., of which 9,000*l*. is being given by the

Lancashire County Council and the Manchester and Salford Councils.

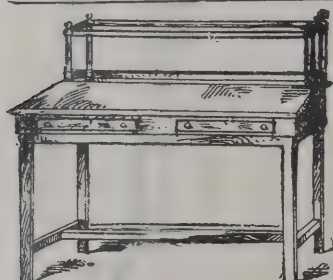
NEW buildings, costing about 4,000*l*., are to be erected at Carnoustie station, N.B. The plans have been finally adjusted by the railway authorities and work is to be commenced immediately. The question of a new station is one that has been raised repeatedly by the municipal authorities of the burgh, and as far back as three years ago the railway companies promised to erect suitable buildings.

At a meeting of the sewage disposal committee of the Carlisle Town Council it was decided to recommend the Council to adopt a scheme for treating the sewage of the city on the bacteriological system, according to a report prepared by Professor Dibdin and Mr. Markes, city surveyor, at an estimated cost of 60,000*l*. The scheme provides for pumping apparatus sufficient to pump six times the normal dry weather flow as required by the Local Government Board.

A LOCAL GOVERNMENT BOARD inquiry has been held into the application of the Fylde Water Board to borrow 159,407*l*. for the construction of a new reservoir to hold 332 million gallons of water at Grizedale Lea, Burnace-with-Bonds. Mr. T. Loftus, clerk to the Fylde Water Board, said that 137,727*l*. was required for the new reservoir, 20,000*l*. for the general extension of the water main, and 1,680*l*. for miscellaneous work.

NOTICE has been given that in the ensuing session of Parliament the trustees of the late Mr. G. A. Baird, of Auchmedden, Aberdeenshire, intend to apply for a provisional order to endow Pennan Harbour Trustees with power to construct and maintain new harbour works. These operations comprise a new west pier or breakwater. Power is also sought to borrow money for the purpose of the order and to levy harbour dues.

At the next meeting of the Worcester Urban Council the water and sewage committee will ask for authority to obtain tenders for the first section of the sewage disposal works, for which the Local Government Board approved a loan of 52,000*l*. in January 1901. The finance committee propose to borrow 50,000*l*. at 3½ per cent. and expenses amounting to 15*s*. per cent., to cover various loans for which the Local Government Board's sanction has been already obtained.



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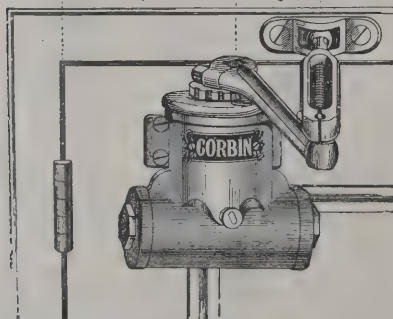


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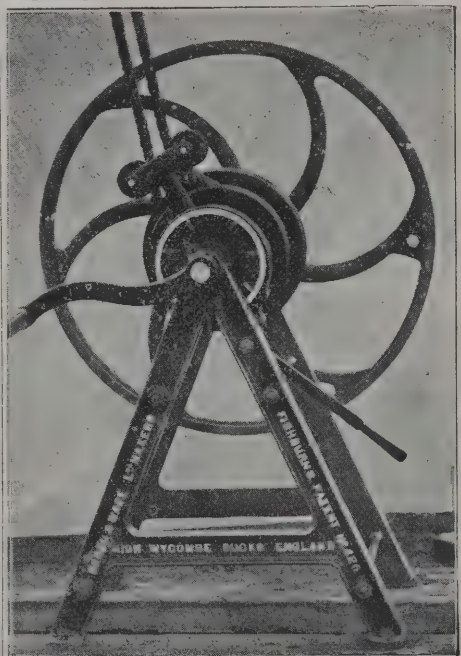
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THE present workhouse at Gloucester has been condemned for some years as altogether inadequate, and a few years ago an excellent site was obtained at Suffley, on which the Board decided to erect a new workhouse, hospital and cottage homes. Then a new Board was called into existence, and the whole scheme was shelved. The Local Government Board latterly have pressed the Guardians to come to some final decision. It was eventually decided to send a deputation to the Local Government Board on the matter.

THE bridge committee of the Workington Town Council recommend that application be made to the Local Government Board for sanction to borrow the necessary sum with which to complete the works in connection with the bridge and approaches connecting Northside with Workington; the sum to be total cost of the works as estimated by the engineer, less the 5,000*l.* which the Workington Corporation Act of 1899 authorises the Corporation to spend without sanction, and the further sum of 7,500*l.* which has been applied for from the County Council as the amount of their contribution towards the works.

### BUILDING BY-LAWS REFORM.

A MEETING was held at 29 Bloomsbury Square on Monday on the question of oppressive building by-laws. Sir William Chance, Bart., was elected to preside. After an address, in which he referred to cases of hardship under oppressive by-laws in various parts of the country, the Chairman moved the following resolution:—"That in consequence of the general complaints about the oppressive nature of the model by-laws (drawn up originally to meet the needs of urban districts only) in rural districts or rural portions of urban districts, it is thought that the time has come for the formation of an association for the purpose of drawing public attention to the matter, and it is hereby resolved that an organisation (to consist of the persons present, with others who have given their assent, or who may hereafter do so, and pay a minimum annual subscription of half a guinea) be now formed, to be called the Building By-law Reform Association, to promote amendments of building by-laws so as to limit official control of private buildings to what only the public health and safety demand, and thus remove encroachments on individual liberty."

The resolution was seconded by Mr. E. D. Till, and supported by Mr. A. H. Clough, Mr. W. M. Acworth, Mr. Anderson Graham, Mr. Christopher Turnor, Mr. Mark Judge, Mr. E. L. Lutzens, Mr. Thackeray Turner, Mr. A. H. Vowell, Mr. Lacy Ridge and Mr. R. W. Schultz. The resolution was carried unanimously. After considerable discussion the following resolution was also passed:—"That the special objects of the Association be—(1) To promote the adoption of the new model building by-laws for rural districts (which are approved of and recommended by the Local Government Board) in rural districts or in the rural portions of urban districts where the old model by-laws are still in force. (2) To promote the adoption of the new model building by-laws for rural districts by the authorities of such districts, or of districts partly urban and partly rural where the authorities may wish to adopt building by-laws. (3) To promote amendments which will bring the by-laws of urban districts more into accordance with present requirements and modern science. (4) To secure some method of appeal to the Local Government Board or other authority, where the enforcement of any by-law would create a hardship and its non-enforcement could do no damage to the interest of the public generally. (5) To assist as far as possible, in suitable cases, those who may be oppressed in any way by building by-laws." A provisional council was elected, and Mr. R. A. Read, of 45 Parliament Street, was appointed secretary *pro tem.*

### STURTON CHURCH, NOTTS.

THE parish church of Sturton-en-le-Steeple, which was partially destroyed by fire on February 24, 1901, was reopened on Wednesday afternoon by the Bishop of Southwell, after undergoing complete restoration.

The church, which is dedicated to SS. Peter and Paul, consists of a western tower containing five bells, nave of three bays, with north and south aisles and chancel of three bays, the north aisle being continued to the first bay of the chancel, whilst a further continuation eastwards affords a spacious vestry. With the exception of the tower and the outer wall of the fabric, the whole church has been rebuilt, for although the nave arches remained standing after the fire, they were so shattered by its action that they had to be taken down, and, in like manner, the windows were so severely damaged that they

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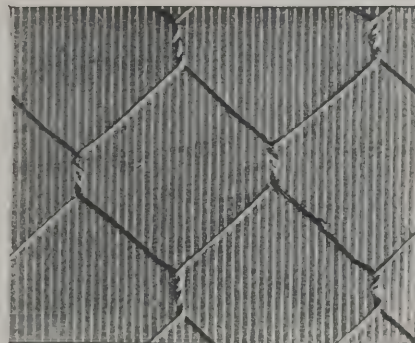
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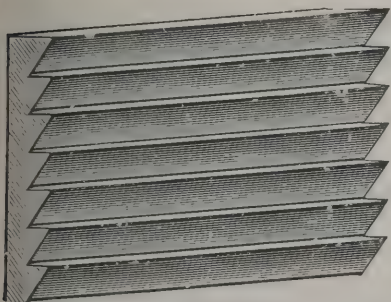
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had to be replaced by new stonework. The oldest part of the church is probably the north wall of the chancel, which retains a small Norman window now open to the vestry, and many fragments of transitional Norman work have been discovered. In the thirteenth century the nave appears to have been built, and, though some of the capitals were afterwards altered, a portion of one of the originals was found, and has been embodied in the wall at the west end of the north aisle. It retains its carving, which is somewhat crude in character. The magnificent tower—a landmark for miles around—was built in the fourteenth century, and its original parapet may still be seen about halfway up the existing building, which was raised to its present height in the fifteenth century. The church was restored in 1871 under the supervision of the late Mr. Christian, when the low clerestory of the fifteenth and sixteenth centuries was removed and a high-pitched roof put on from end to end. During the present restoration a clerestory has again been added, and it has been carried to a greater height than the former one. The new clerestory possesses more architectural features than its predecessor, and adds greatly to the light and general effect of the church both internally and externally. The new roofs are of pitch pine, very handsomely designed, and with heavily-carved mullions. The screens which were destroyed by the fire have been reproduced as accurately as possible from careful study of photographs and the charred remains which were found. The other fittings are all new, and have been designed so as to accord with the general character of the church. The seating is now of solid oak, instead of pitch-pine, as provided in the former restoration. A particularly handsome sedilia, bearing the arms of the diocese of Southwell, has been placed in the chancel by Mrs. Harrison, the widow of a former vicar. The old floors, of somewhat poor tiles, have been superseded in the chancel by a flooring of red and white Mansfield stone, and by plain stone in the nave and aisles, where the seat spaces have all been covered with wood-block flooring. The reredos is of simply carved oak panelling, and the pulpit is also of oak, ornamented with beautiful openwork carving, supported upon a plain stone base, and opposite to it is a brass eagle lectern. In the chancel two interesting memorial slabs have been found, very little damaged, and bearing dates early in the sixteenth century, but the family monuments in the baptistry under the tower, being constructed of marble, have been hopelessly disfigured. The work of rebuilding the great arch of the tower was accompanied with very considerable difficulty owing to the great

superincumbent weight of the tower, and an elaborate system of underpinning had to be adopted. There was formerly a font of modern design in the church, but this was destroyed in the conflagration, and it has been replaced by a very old font from the disused church in the neighbouring parish of West Burton. With the exception of the reintroduction of the clerestory and the consequent alteration in the pitch of the roof, the restoration has been so carried out as to carefully reproduce the partly demolished church as it was before the fire. The whole of the work has been undertaken in accordance with the plans and designs of Mr. C. Hodgson Fowler, F.S.A., of Durham.

## GARDEN CITIES AND THE HOUSING PROBLEM.

THE "Garden City" has apparently come to stay as an attractive and practical solution of the housing problem. So, at any rate, think its promoters, men of such ripe experience and business knowledge as George Cadbury, of Bournville, and W. H. Lever, of Port Sunlight. These philanthropically disposed manufacturers have found out that it pays to make men and women as well as cocoa and soap, and they give their workers healthy conditions of life and homes to live in at reasonable rents. They recognise that this can only be done by removing their factories out of crowded centres to rural districts, where land can be bought cheap and of sufficient quantity to permit expansion.

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The propagandist Association which was formed three years ago to make this project known has now a membership of 1,700, being an increase of 1,200 in one year. In the annual report about to be issued, it is also stated that the income for the past fourteen months has increased fourfold, and that nearly 200 lectures have been arranged to be delivered throughout the country during the winter. The Pioneer Company which has been formed to put the ideas into practice has now raised its full capital of 20,000l., and expects the public to provide the balance before the close of 1902. The directors are Messrs. Ralph Neville, K.C., Edward Cadbury, Ebenezer

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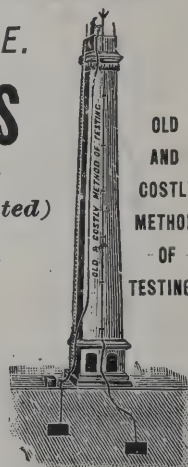
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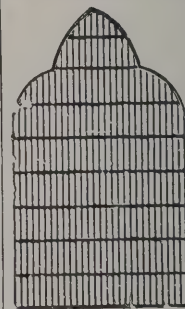
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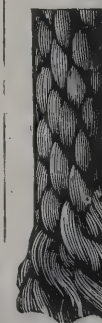
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### TRADES' TRAINING SCHOOL.

THE certificates and prizes awarded to students of the Trades' Training School were distributed on Monday night by Lord Monkswell at the Carpenters' Hall, London Wall. The School is carried on at 155 Great Titchfield Street by six of the City companies, namely, the Carpenters, Joiners, Painter Stainers, Plasterers, Tyllers and Bricklayers and Wheelwrights. Mr. Walter Smith (master of the Carpenters' Company) occupied the chair, and was supported by Mr. Percy Preston and Mr. F. A. Crisp (the wardens), the Master of the Painters' Company, Professor T. Roger Smith (chairman of the joint committee of the School) and Mr. H. Phillips Fletcher (director). A report on the work of the School during the past session was read by Professor Roger Smith, who said that he could honestly congratulate the allied companies on the uninterrupted prosperity of the School. Instruction had been given in eleven classes, and in some cases the work was the best that they had ever had. He mentioned that no students were admitted who were not in some way or other connected with the building trade. Lord Monkswell then presented the prizes to the students of the School, and afterwards distributed the certificates and medals gained at the Carpenters' Company's examinations in sanitary building construction and in carpentry. He stated, in the course of a few remarks, that he had recently had the privilege of visiting the School, and was pleased with what he had seen there. The associated companies had every reason to be satisfied with the work of the past session. In addressing the students a year ago Sir Michael Foster spoke of the necessity of their having an adequate basis of fundamental elementary knowledge. He hoped that they would take that observation to heart. Before launching out ambitiously they should try to ground themselves

on fundamental knowledge, as by doing so they would have a firm foundation to build on. The great object of the School was to make good workmen and not to provide facilities for artisans to enter the professions. To be a good workman was in itself an excellent thing. It was a pity that there were not more training schools of the kind. Technical education was of great importance in these days, and he was pleased to see that the City companies were supporting such an admirable institution. On the motion of the Master of the Painters' Company, a vote of thanks was accorded to Lord Monkswell.

### MUNICIPAL FLATS IN WOLVERHAMPTON.

ON Saturday afternoon the Municipal flats which have been erected in Green Lane, Wolverhampton, by the Corporation for the purpose of providing sanitary dwellings for the poorest class of people in the town, who now dwell in the courts and alleys, were inspected by a number of representatives of the Wolverhampton Trades and Labour Council. The deputation were accompanied over the buildings by Alderman L. Johnson (chairman of the housing committee) and Mr. George Green (the borough engineer).

In the course of a discussion a number of questions were put to Mr. Johnson, who stated that the idea of building the flats for the accommodation of Corporation employees had never been entertained. They were provided solely for that class of the poor who were unable to earn more than 20s. a week. So far as he knew there were no men working for the Corporation on the roads who earned less than 18s. a week, and such men would be eligible as tenants. The scheme of the housing committee was not an artisans' dwelling scheme, and artisans earning good wages would be debarred from occupying the flats. The housing of the poor, he contended, was a problem which would never be solved until the poor were provided with sanitary tenements at the rentals they were now paying. It was hoped to prevent overcrowding, and the two-roomed flats could be occupied by two adults and one child, and the three rooms by three adults and two children. A man, therefore, with a large family would not be eligible as a tenant. The speaker said the London County Council could obtain money at 2½ per cent, but Wolverhampton could not float stock under 3 per cent, and he emphasised his view that cheap money was absolutely necessary to carry on housing operations successfully.

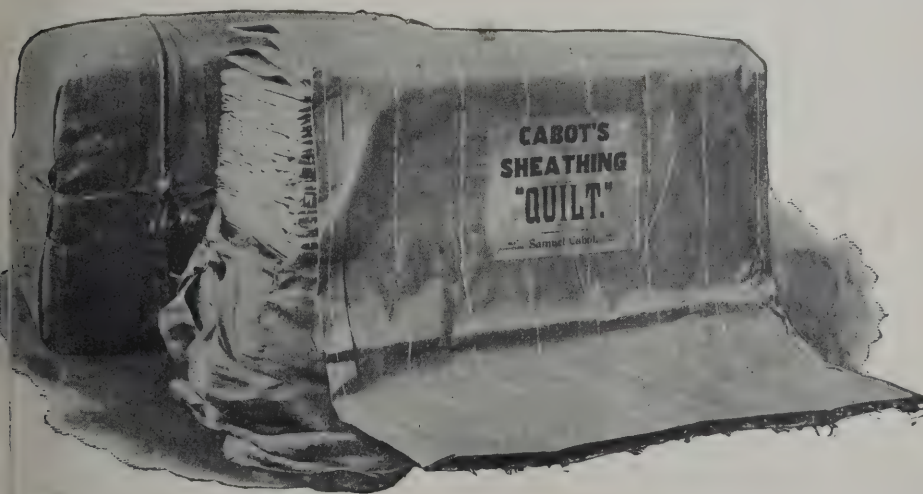
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Replying to a question as to the area of the rooms, and whether the Corporation had broken their own by-laws in erecting houses of this character, Mr. Green stated that the by-laws provided that no room should have a less superficial area than 108 feet. The rooms in the flats had an area of 118 superficial feet.

After further discussion Alderman Johnson and Mr. Green were thanked, and there appeared to be a consensus of views that the Corporation had taken a wise step in providing such accommodation for the poor. On Friday the deputation will discuss the experimental scheme with the housing committee and the health committee of the Corporation.

### LONDON AND SOUTHAMPTON CANAL.

THE proposed canal to unite London with Southampton is regarded at the latter place as a scheme which, if carried out, would bring vastly more trade and shipping to the southern port. At the same time, if coal can be found beneath the chalk in North Hants, as geologists predict, both London and Southampton could be cheaply supplied with coal by means of the canal. At present the expense of transport to and from London is very heavy, for in addition to the railway carriage there is the expense of barging from Nine Elms, where there is often great congestion of traffic. All this would be avoided, as the same barge would take the goods direct from ship's side at Southampton to the London Docks, and *vice versa*. Formerly, and until recent times, a very large amount of traffic was sent from Southampton by the canal to Winchester. The water was taken from the river Itchen, one of the two rivers on which Southampton stands. This river flows by the docks and is navigable for barges as far as Woodmill, to which the tide flows—a distance of three miles. From this point the canal, or barge river, begins and extends to Winchester, about twelve miles distant. The locks and towing paths are dilapidated, but could easily be restored. This canal was first made in the reign of Richard Cœur de Lion and his successor by Godfrey de Lucy, Bishop of Winchester, who, by raising a vast mole at the head of the river near Alresford, formed a lake now called Alresford Pond, thus creating a reservoir for supplying the navigation. It was restored, after having fallen into decay, by a company of citizens at Winchester, who obtained an Act

for the purpose in the reign of Charles II. The average depth of water in the canal is about 5 feet.

### WOOD-WORKING IN SUSSEX.

WOOD-WORKING is one of the most ancient industries in the county, says the *Sussex Daily News*. It is, in all probability, older even than agriculture itself, for it was man's early attempts to make the trees of the forests of use to him that produced the first rude tools designed for preparing the ground for the reception of his seeds. Wood, at any rate, was in use before iron implements were fashioned. The principal wood-working industry in Sussex is that in regard to oak timber. This wood, both in abundance and in practical value, stands far ahead of any other kind. Sussex, in fact, is really famed for no other timber but oak, which has been called the "weed" of the county, because it thrives so well and grows so fast. It is an undisputed fact that Sussex has always been noted for yielding oak of the toughest and best quality in England. In the reign of Queen Elizabeth, when that royal and energetic lady was making one of her numerous peregrinations in the county, the vast quantity of splendid oak attracted her attention, and she is said to have exclaimed:—

"This is the most lovely district I have ever seen for producing oak for building ships for Her Majesty's navy; with a view of further encouraging its growth, I declare that all woodlands in Sussex shall be free from payment of any tithe for ever."

Few people indeed know that all Sussex woodlands are free from tithe, and that the utterance of Queen Elizabeth has been fruitful in many legal disputes. The outcome of this historical incident was a great stimulus to the industry of wooden ship-building with oak, which has up to within the last few years been carried on extensively all along the coast of Sussex, and particularly at the ports of Rye, Newhaven, Shoreham and Littlehampton.

As recently as forty years ago there were said to be 100 pairs of pit-sawyers at Rye alone, besides numberless shipwrights and others engaged in the industry. With regard to Rye, the wooden shipbuilding has somewhat revived during the last few years in the construction of flat-bottom boats used for carrying coal and a few fishing smacks for the east-coast trade. Early in the last century the Government requirements

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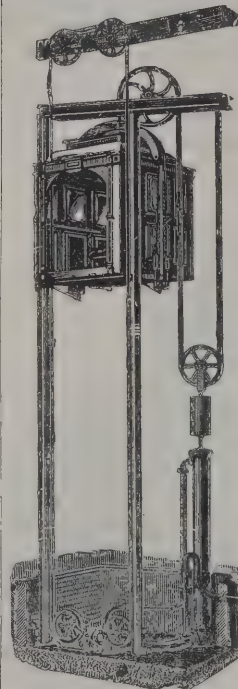
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for English oak for shipbuilding purposes were enormous, and in the "sixties" contracts for 60,000 loads of 50 cubic feet each, of the probable value of 500,000*l.*, were given out without difficulty. With the decay of wooden shipbuilding and the adoption of ironclads, the railway companies became some of the largest buyers of English oak for their trucks, but these trucks are now largely made from cheap wood imported from foreign countries to the exclusion of English timber, while many are being made of iron. One large source for the consumption of English oak was the erection of groynes for sea defences along the seventy miles of Sussex coast. A hundred years ago the consumption of the town of Brighton in this respect was very large. These, again, are often now made of cheap foreign wood and some of cement concrete.

Much interest attaches to the process of dealing with the oak tree, which is unlike that adopted in connection with any other timber. Oak is mostly sold to merchants in the early spring, and the first process, which starts usually about the third week in April, just as the sap begins to rise in the trees, is the peeling of the bark by gangs of men called "tan-flayers." The importance attached to this peeling of the bark is great, as any inexperience or carelessness on the part of the workers is liable to be attended with very serious results. The peeling season lasts from about the middle of April to the end of May. Ideal weather for the work is warm, sunny days, with cool nights, and a warm shower about once a week. "Flayers," as the bark-peelers are called, begin by taking off the first length of bark before throwing the tree. When the tree has been hewn the greatest care has to be exercised in taking off the bark, only experienced and conscientious men really doing it properly. This process of itself employs a great number of hands, and is the first harvest of the year. In the woodland districts of old good men were willing to work all the hours of daylight, and have been known to earn 40*s.* and 50*s.* a week, and even more, at this work. The bark is set up in a particular way for drying, and afterwards has to be harvested for a certain time, after which it goes through other processes before it is fit for use by the tanner of leather.

Sussex oak bark is always held in the highest estimation, and until recently the fixing of the price of best Sussex bark was a great event in the year for timber merchants and tanners alike. Bark is sold by the antique measure so puzzling to outsiders, viz. by the load of 45 cwts. hatched. The price of the article has been known to vary in comparatively recent times from 8*l.* a load to 42*l.* a load. Formerly, war times

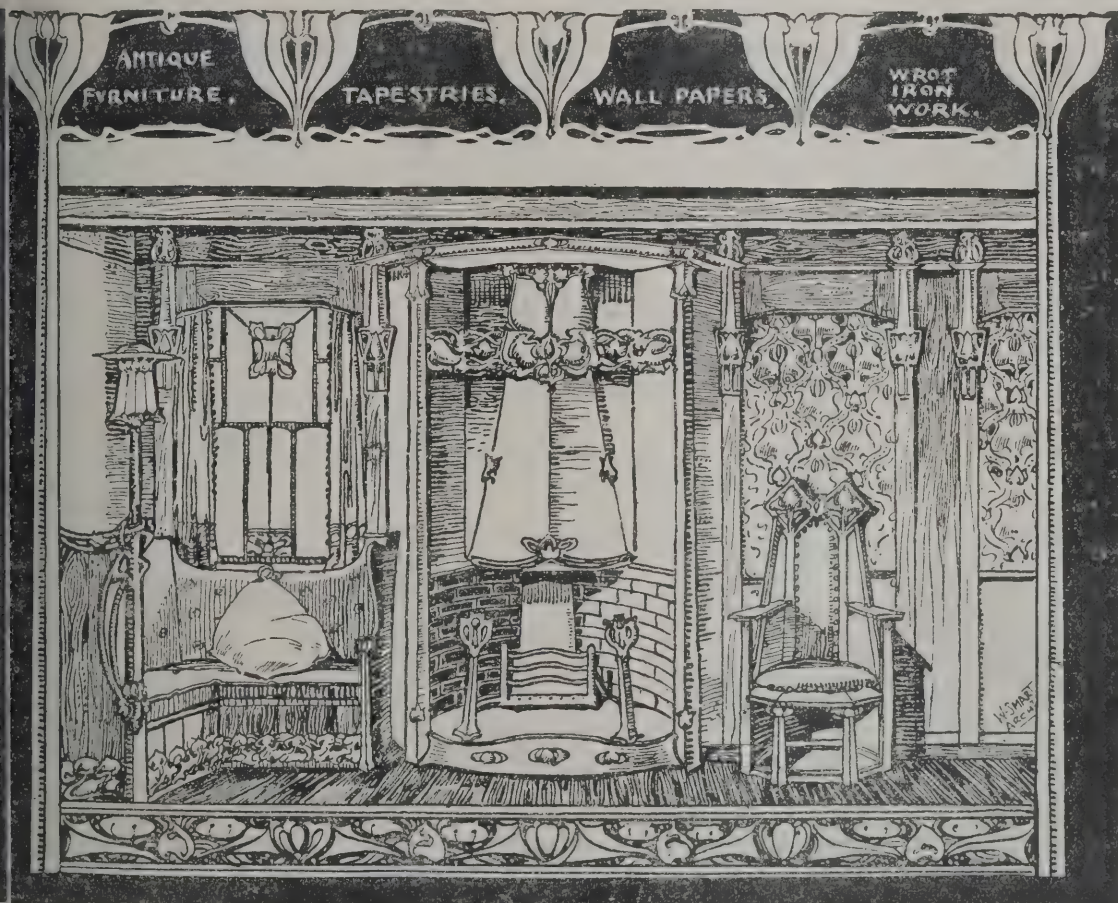
greatly affected its value. But the oak-bark tanning industry, like the English timber trade generally, has decayed, and there are very few tanyards now left in Sussex, whereas formerly nearly every large village or parish had its own tannery.

Other kinds of timber are grown in Sussex besides oak, but for these the county is not specially noted. Elm usually grows on the good soils; beech to a considerable extent on the chalk hills in the western part of the county; and in the neighbourhood of Chichester there are saw-mills for making up beech for chairwork, though this industry for native wood has been well-nigh ruined by American competition. Ash of good quality is met with on many soils, and this is a wood in which foreigners have not as yet competed successfully. The fir tribes grow well in the forest districts in the north of the county, and of these larch is by far the most valuable wood. Chestnut, alder, poplar and birch also thrive on suitable soils, but cheap foreign woods have greatly reduced their value.

### PLUMBERS AND THE PUBLIC HEALTH.

DR. FARQUHARSON, M.P., presented the prizes to the successful students in the plumbing classes at the Robert Gordon's College, Aberdeen. Amongst those present were the president of the District Council for the National Registration of Plumbers, Professor Matthew Hay; Dean of Guild Lyon; Mr. Charles Stewart, Headmaster of the Robert Gordon's College; Councillor John Ross; Mr. Kenneth Cameron, sanitary inspector, &c.

In presenting the prizes, Dr. Farquharson referred to the great necessity for the registration of plumbers. He said the one great aim and object of the movement was to raise the position of the plumber, and to let people know that he wanted to do his work honestly and straightforwardly in the interests of the human race. The plumber had a great deal in his power as regards the sanitation of houses. If his work was not well carried out, then of course under our hidden system of sanitation great evils might arise. Under the ordinary system of sanitation people lived upon great sewers protected from them by traps, pipes, and other modern methods of sanitation, which, if not carried out in a workmanlike manner, might mean great destruction of human health and human life. They knew perfectly well that all diseases were water-borne, and if their water got in contact with their sewage almost



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every disease they had could be communicated to the unfortunate household by bad or inefficient plumbing.

He referred to the endeavours made to carry the Bill, which had already passed the House of Lords, through the House of Commons, to place the registration system upon a statutory basis. What they wanted was a "hall-mark," by which it would be known that plumbers could be safely employed to carry out the difficult and dangerous duties which they are called upon to do.

He referred also to the recent deputation which waited upon the President of the Local Government Board, and the very encouraging reply of the President—that the registration system had the warmest approval and support of the Department and the Government generally.

### SCARBOROUGH MASTER BUILDERS.

THE Scarborough Master Builders' Association held its annual dinner at the Albemarle Hotel, Scarborough, on the 29th ult. Mr. A. W. Sinclair presided, and was supported by Councillor Mansfield, York, president of the Yorkshire Federation of Building Trade Employers; Councillors Maynard and Bland, Scarborough; Mr. H. A. Chapman, A.R.I.B.A.; Mr. R. H. Carr, hon. sec.; and Mr. B. Jowsey, vice-president.

After the loyal and patriotic toasts had been honoured, Mr. Horner proposed "The Building Trades," which was responded to by Mr. C. Peckett in a very humorous, entertaining and original speech, which was productive of much laughter.

Mr. R. H. Carr proposed "The Yorkshire Federation of Building Trade Employers." He referred to the fact that although the Federation had only been in existence a little over five years, it had done good work in settling many unfortunate disputes that had arisen. He referred to the yeoman services which Councillor Mansfield had rendered to the Federation not only during his year of office as president, but while a member of the executive.

Councillor Mansfield, in reply, thanked the company for the enthusiastic way they had drunk the toast and received his name. He expressed the pleasure it gave him to again be present at the dinner, spoke at length on the advantages of the Federation, and instanced many cases where disputes having arisen, and the matter having been put before the executive of the Yorkshire Federation, satisfactory settlements had been the

result. He instanced the bricklayers' dispute at Newcastle and others in the West Riding, and mentioned that only last week the settlement of the plumbers' dispute at Liverpool had been arrived at. He urged upon all the importance of amalgamation, and trusted the coming year would be the most successful they had had.

Councillor Bland proposed the "Scarborough Master Builders' Association" in a very happy and interesting speech. He traced the course of the Association since its formation in 1891, and said during the year he was President they had troubled times, but many disputes were settled amicably. He was happy to state that of late they had not been troubled with any labour disputes.

In responding to the toast, Mr. A. W. Sinclair expressed his pleasure at seeing such a large number present, and thought it augured well for the future of the Association. He endorsed the remarks of previous speakers and referred at length to the usefulness of such associations as theirs. The speaker instanced special cases where, had no Association such as theirs existed, disputes might have gone on unsettled for an indefinite period.

Mr. Oxley Smith proposed the "Architects and Surveyors," which was responded to by Mr. H. A. Chapman.

"The Corporation and Borough and Trade of Scarborough," was proposed by Mr. S. Woodhouse, and responded to by Councillor Maynard.

Mr. T. Jaram proposed "The Guests," and Mr. Ernest Bradley responded.

During the evening, the Westborough Press Quartette (Messrs. Morley, Barrett, Judge and Ditchburn), sang "The Frog" and "Home Sweet Home." Mr. H. Fenby sang in a very pleasing manner "Alice where art thou," and "Mary." Mr. Kenneth Metcalfe sang "The Village Blacksmith" and "I fear no foe," and in conjunction with Mr. Fenby gave an excellent rendering of the duet "Excelsior." Mr. R. H. Carr was the accompanist.

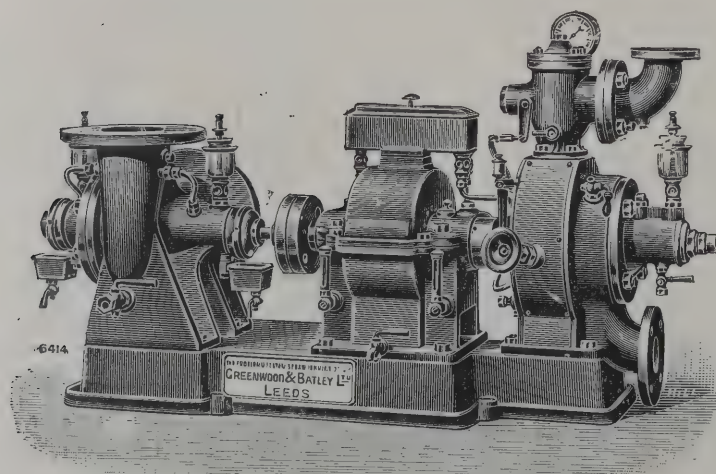
### INSTITUTION OF ELECTRICAL ENGINEERS.

AN ordinary meeting of the members of this Institution was held on the 4th instant, in the rooms of the Institution of Civil Engineers, Great George Street, Westminster, when the president, Mr. James Swinburne, delivered the inaugural address of the session.

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The President said that they had been going ahead so very fast lately that they might be a little apt to have vague views of what they could and what they could not do electrically. It might be well, therefore, to try to look over some of the branches of their great and diverse industry, and see what obstacles were now opposing them, and what were likely to oppose them shortly, and whether the obstacles were insuperable or not. After pointing out that it was the great capital expenditure that wrecked schemes for obtaining energy from tides, he dealt with the question of water power. Some years ago there was a great deal of excitement about the development of water powers. The possibility of "harnessing Niagara" and utilising waterfalls all over the world was hailed as a great triumph over nature, and the idea was that power could be got for nothing, and industries would all migrate from coal districts to the neighbourhood of water powers. At the time of the excitement it was pointed out, largely in vain, that water power did cost something, because the development of a fall demanded a good deal of capital whose interest and depreciation had to be paid. If steam power cost one farthing a unit, and if water power at the same place could be produced for half a farthing the owner of the water power would claim the odd half-farthing as rent, or would just allow the water power enough to encourage the production of a new thing. As a rule, however, water power was not where it was wanted industrially. In the nature of things water powers were generally in hilly countries, and were never near the sea. The result was that water power, as a rule, could not command the same price as steam or gas, because it was not where it was wanted. A blast furnace was more valuable than a water power. There were plenty in England, but the owner who had been wasting the gas up to now would not give it away. He would want rent, so that it would only just pay to use his gas rather than make it. The electrical industry thus did not gain, but the ironmasters did. For many years "electrical energy direct from coal" had been the dream of the electro-chemist, that was to say, he had dreamt of an electrolytic cell in which the consumed electrode was carbon; but, to sum up the matter shortly in the light of modern theory, carbon never formed ions, and had therefore no solution pressure, and could accordingly give no electro-motive force. One of the chief disadvantages of steam-engines for stations with small load factors was the difficulty of storing energy so as to get uniform boiler load. Batteries were no longer used for this, and the difficulty reduced

the value of steam in comparison with the gas-engine. With very cheap gas the first thing was to make big engines, the next to make them so that they never broke down, and the last thing to make them efficient. The gas-engine might be, comparatively speaking, in the state in which Watt left the steam-engine, but it would doubtless make very rapid advances as it was in the hands of very competent and highly educated engineers. As to efficiency in dynamos, they had reached the practical limit already, for further reduction in dynamo losses would make no appreciable difference in the total efficiency of a station. They were not likely to make much advance in dynamos now, as they were limited by the hysteresis loss in iron, which prevented the use of higher inductions in armatures and low permeability, which limited their field and armature tooth inductions. It did not seem likely that they would now find iron much better in either respect. Nor were they likely to find a better available conductor than pure copper. As insulator they had mica. It looked therefore as if they were in sight of their limits in dynamo and motor designs. In alternating transformers there had been little room for improvement for the last ten years. The "ageing" of the iron was a trouble, but now there seemed little possible advance. The secondary battery had for a long time been on the border of success for traction work, both on tramways and on the road, and a further improvement in batteries might be expected to produce very great changes in important branches of engineering. The first question asked was, "Why do you stick to lead?" The answer was that the case was very special, and other things would not do. They were practically limited to lead, at any rate, in acid cells. Their limits in secondary batteries thus seemed to be settled by the need of having insoluble electrodes and insoluble coatings. The conductor itself could hardly be improved, but there was great room for improvement in the insulation. It was largely the insulation of the cables that limited their pressures, and therefore their distances of transmission. It was exceedingly unlikely they had reached the limit of insulation. There was no branch of electrical engineering so important as cable making, yet there was no branch of the industry which was run on less scientific lines. The days of secret mixtures known only to the workmen who made them might be passing away, but even now the whole art of cable making was a question of trial and error with a good deal of the last component. Engineers did not know now whether rubber was better than paper, nor could they tell what any particular make of cable would be like after

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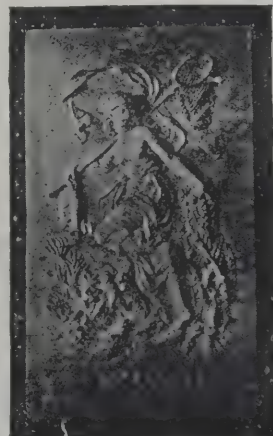
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ten years' use. They did not even know how to test a cable. Their chief work until lately had been producing light. There the inefficiency and waste was prodigious, and though it was mostly unavoidable, there was still great room for improvement. They took great care over their stations, watching every penny from the coal-shovel or mechanical stoker to the station meter. They quarrelled over 1 per cent. in the generators, when they got to the mains they cared less, and once they had got to the consumers' meters they cared nothing at all. As to the arc light, they did not seem to have reached their limit as to light from pure heating, because they lost a lot of light into the opposite carbon. They could not say they had got anywhere near their limits of high temperature efficiency in running, low temperature in starting, or high pressure in the electrolytic lamp. It was absurd to attempt to consider the limits of the use of electrical transmission on railways at this date. The future of electric railways, electric tramways and automobiles was rather a matter of vague conjecture and picturesque prophecy. They might, however, say that they were limited by the want of either a variable speed, simple alternate-current motor, or a simple variable speed-gear capable of transmitting a very large torque and packing into an engine. In electric tramways there was no limit in sight. The power could be sent over any distance desired, and there seemed to be no limit to the people who wanted to travel on electric trams. The question of electrolysis was rather that of a limit to the duration of pipe companies' property. It was a very difficult question. Though the threatened effects of electrolysis had no doubt been exaggerated, it was at best a question of degree, and the ingenuity of engineers was continually reducing the chance of damage.

#### ENGLISH ENGINEERING.

THE annual meeting of the Leeds Association of Engineers was held on the 6th inst.

Mr. Alderman Wigram, a member of the firm of Messrs. Fowler & Sons, who supplied the greater part of the transport for South Africa, confessed that he had recently been struck with the enormous push and progress shown by America in all branches of the American trade. What was wanted in this country was more brains, not only in the masters, but in the foremen and the workmen. He often wondered how the Americans

managed to find the quantity of brains that they did. To some extent he thought it was because they were able to offer inducements to the best of our men to go over there. One constantly found Englishmen and Scotsmen at the heads of departments in America. At the same time the extraordinary improvement that had been made was no doubt due to the pains they took with the training of their workmen. The Americans had recently reverted to a system which we had given up long ago—the apprentice system for the training of young people. We looked upon that system as belonging to the Middle Ages, but our American friends had taken it, had modified it, and had brought it into their works. One striking point about it was that they were endeavouring to bring in and give advantages to those who had been trained in technical schools. A direct premium was placed by American master engineers upon technical education. Technical education in England was not producing, and probably never would produce, what they wanted—an intelligent and highly trained workman who still had a pride in his work; but the Americans had adopted a system which gave an advantage to the lad who came to the business after having spent some time in getting a technical training before he came. That was a method which he commended to engineers in this country.

The Lord Mayor (Mr. J. Ward) mentioned that some time ago he was travelling on the Continent, when he met an Egyptian engineer, who said that in Egypt they had come to the conclusion that the English locomotive was much superior to the American. This gentleman told him that they had carefully examined engines, and in point of workmanship and material an English engine surpassed all others. It was very gratifying to know that that engine had been supplied by a Leeds firm.

Mr. James Campbell expressed the opinion that there was a great future before English engineers. He had recently heard that a Leeds firm had secured a most important order for machinery in the face of the whole world in open competition, so that English engineering was not dead yet. In addition to this they now had the two new territories of the Orange River Colony and the Transvaal open to them, which were closed before, and if the English Government only looked to English interests and gave them a fair field they would have no reason to complain. If they kept up to date, got the best tools, looked to the question of cost, and relied on the quality, design and endurance of their work, they need not fear foreign competition.



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# The Architect.

## THE WEEK.

THE result of the action *JACOB v. Corporation of Southend-on-Sea* should be taken as a warning by municipal authorities of the risks incurred in allowing roads to be used unless they are in a perfectly safe condition. The Corporation were constructing a sewer, and had sunk a shaft. The work was not carried out by their own workmen, but by a contractor. The earth had been thrown back over the shaft, but apparently had not been sufficiently rammed down. The plaintiff, who was driving along the road, caused the earth to subside; he was thrown out of his trap and seriously injured. The defence of the Corporation was that the soil was disturbed by an escape of water from a broken gully-pipe, for which they were not responsible. The jury found a verdict for plaintiff of 3,500*l.* damages. A stay of execution was granted on condition that 1,500*l.* was paid over within a fortnight.

LAST week we referred to the evidence given by one of the city officials before the Glasgow Housing Commission. In one sense the evidence of the medical officer of Glasgow is even more appalling. According to Dr. CHALMERS, 13·7 of the inhabitants live in "houses" of one apartment. But 22 per cent. of the deaths from all causes arose among the occupants, or an excess of fully 8 per cent. The deaths from phthisis among them were 2·5 per 1,000, while it was 1·8 in the two-apartment population. The overcrowding was, however, profitable. Tenants who paid from 7*s.* 0½*d.* to 8*s.* 3½*d.* per month were able to derive from sub-tenants sometimes 10½*d.* per night, sometimes 4*s.* 6½*d.* per week. Dr. CHALMERS asserted that 60 per cent. of the sub-tenants were drunkards, and he considered that it was too easy in Glasgow for a bad tenant to find accommodation. He maintained that the getting of a room should be rendered as difficult as possible. Some of the members inquired what should be done with the residuum which should not be allowed to hire rooms. The chairman said, "Reduce the residuum of the population to the smallest number you choose, how are you to deal with them?" The only answer the medical officer could give was the establishment of labour colonies or the erection of buildings in which such people would have to go through an educational process which would qualify them to become tenants of single rooms without being a danger to the neighbours. It is always well that a proposition should be reduced to its lowest and simplest terms. Half a century ago CARLYLE spoke about the fertility which would be possible for the Scotch hillsides were the Glasgow sewers once opened on them and the miserable lack-alls set to work at cultivation. If they disobeyed he had a summary remedy, "I will admonish and endeavour to incite you; if in vain, I will flog you; if still in vain, I will at last shoot you." The Glasgow evidence would indicate that the builder alone cannot solve the housing question, and that his efforts must be supplemented by measures of another kind.

M. OSIRIS by his munificence has made his name known to all Frenchmen. A rich man, he lives in the quietest way in Paris as if he were desirous to increase the fortune which he applies to the general good. Always opportune in his undertakings, it was felt he had selected the right time to restore the château of Malmaison, the site of the *mala mansio* of Mediæval days, from whence issued the feudal chief ODon, who waged war on the boatmen of the Seine. In 1798 JOSEPHINE BEAUHARNAIS obtained possession of it, and there NAPOLEON is said to have spent his happiest years. There was a likelihood recently that the building would be sold to the highest bidder, and M. OSIRIS resolved to purchase and restore it as one of the historic monuments of France. The work has been executed, and all that remains is to pay the bills. It is not easy to reproduce the style of the Consulate, which was a very graceful adaptation of the Roman. M. OSIRIS imagined that all the masonry required would be executed for 200,000 francs, or 800*l.* The contractor for the masonry, however, demands 431,563 francs, or more than double the

amount anticipated. M. HUMBERT, the architect, has had the bill reduced to 300,388. The experts employed have declared that the correct amount should be 225,315 francs. The joiner's bill was 67,169 francs, which is now reduced to 60,000. The painter's account has been brought from 27,543 to 16,747, and over 4,000 francs have been taken off the bill of the locksmith. The case has come into the Court, and nearly all the contractors uphold their demands. It is to be regretted that an amicable arrangement has not been possible, but although the French have a very elaborate system of builders' prices, it is not readily applied to restoration.

THE decision which was given by Mr. Justice BUCKLEY in *TOLLER v. SPIERS & POND, LTD.*, should at once lead to an amendment of the Factory and Workshop Act. All who enter the City from Blackfriars are acquainted with the City Mills in Upper Thames Street, which was the building referred to by his lordship. It has a very narrow frontage compared with its height, but it extends to the edge of the river. The building is occupied by two tenants, and is an example of the thoughtless way in which mills were erected several years ago. Although there is a basement and seven upper floors, and extraordinary length, there is only one staircase, which is close to Thames Street. The County Council served notice on the owner that adequate provision of escape in case of fire should be made. The owner was willing, and the tenant of the upper part was willing, but Messrs. SPIERS & POND as occupiers of the lower part declined. The owner, therefore, came before the Court in order to have it determined whether he could legally compel that firm to allow him on their premises in order to carry out the works demanded by the London County Council. Mr. Justice BUCKLEY, whose authority few lawyers would care to dispute, distinctly stated that the owner had no legal right to enter any part of the building occupied by the defendants or to carry out the works. When it is remembered that throughout England a great many factories exist which were originally erected for a single occupant, but have to be sublet, as well as others in which several tenancies were originally contemplated, the judgment is almost sufficient to have the Act considered as inoperative. In many cases we hope the tenants would agree in co-operating with an owner in order that measures of safety might be realised. On the other hand, it could not be said that Messrs. SPIERS & POND were exceeding their rights in opposing the landlord's proposal, and they had, no doubt, grounds for the course adopted. But similar reasons may prevail in other places, and, so far as can be discovered, the opposition of one tenant can nullify the provisions of the Act.

THE account which was given by Mr. CLOUDESLEY BRERETON of French rural education in the paper he read before the Society of Arts does not suggest that, as regards buildings, things are better managed in that country. Every commune must have a school of its own or must share in one; the former course is preferred, for only 2 per cent. of the communes have a school in common. In one instance, where the scholars numbered five, a school was erected at a cost of 800*l.* United districts, such as in England, would not be tolerated in France. As a result, out of 36,174 communes not more than 47 are without schools. They are generally kept in good repair, but the school furniture is rarely satisfactory. The love of art is gratified on very economical terms, for the big posters of picturesque scenery which are prepared as advertisements by railway companies are used for adorning the walls in many cases. The cost of a place in English Board schools is 14*l.* 12*s.* 8½*d.*; in France it amounts to only about 12*l.* The cost of building and furnishing is divided in the following proportions:—40 per cent. is paid by the State, 4 per cent. by the department, and 56 per cent. by the commune. Accommodation for teachers is not very generous; an assistant teacher is supposed to have two or three rooms, but they often have but one, and it may be without a fireplace. The teachers appear, however, willing to make sacrifices, knowing the importance of their work and the influence it will exercise on the France of the future.





PAINTERS' ARCHITECTURE: A TURKISH CASTLE.

### APPROVAL OF MATERIALS.

**A**FTER monopolising the attention of so distinguished a lawyer in commercial affairs as Mr. Justice WALTON and a special jury for nearly a week at Liverpool, the case *INGRAM & CLARKE v. HOLME & KING, Ltd.*, came to an end in the manner which was anticipated. It is not often so large a sum as 2,512*l.* 18*s.* 2*d.* is claimed for cement, but the money was perhaps of less consequence than the other issues which that sum served to represent. The case was, however, of the simplest kind, although it could have been carried on for fifty days as easily as for five. The most important principle at stake was the power which an architect or engineer possesses when his "approval" is made a condition in a transaction. On that account we propose to deal with the case by looking at it in its general relations to contracts for construction undertaken with architects or engineers as the chief authority.

The circumstances were as follows. The Liverpool Corporation having at great expense obtained a supply of water from Wales, found it necessary to provide an additional reservoir at Prescott. Concrete was to be employed to a large extent. The specification described the quality of the Portland cement which would be used, and it was stated that the engineer was to be satisfied with it, and if it failed in that requirement it was to be rejected. Messrs. *HOLME & KING, LTD.*, sent in a tender amounting to 98,450*l.*, which was accepted.

Several of the parties who submitted tenders made application to Messrs. *INGRAM & CLARKE* for prices for the supply of cement. It seems remarkable in these days, when so many complaints are heard about foreign rivals, that the principal English makers would not guarantee cement that would withstand the prescribed tests. There was however, no difficulty in finding Belgian cement that would be equal to the high tensile strength exacted. Messrs. *INGRAM & CLARKE* were, therefore, able to send a quotation to Messrs. *HOLME & KING*, agreeing to deliver cement at Prescott at the rate of 39*s.* 6*d.* per ton. There was no clause in the specification by which Belgian cement would be excluded. Messrs. *HOLME & KING* were, of course, anxious to have an adequate supply, as they were liable to a penalty of 100*l.* a week if the work was not completed at a stipulated time.

The contractors were informed by the engineer that the briquettes did not answer the seven days' test. At Messrs. *HOLME & KING*'s desire it was agreed that a 28 days' test should be substituted. Complaints were made to the plaintiffs in August of last year, especially in regard to two deliveries, one of 1,000 bags, and the other of 448 bags. The material was of the variety called "Scales" cement. Thereupon the plaintiffs arranged to supply another variety known as D. & H. cement, and the deliveries began in the following October. The latter was not found to be satisfactory by the Corporation engineer, and he refused to allow its use. The prohibition was a serious affair for all parties. The defendants employed 50 tons for experimental purposes, but, of course, not on the reservoir, and paid for them, but they were compelled to remove over 600 tons, and to store it in a warehouse, for which expense as well as for the loss entailed by the suspension of the operations Messrs. *HOLME & KING* counterclaimed.

The plaintiffs, for the sake of their reputation, were obliged to bring forward a great many witnesses to testify to the quality of the cement. A member of the firm of manufacturers stated that the same mixture of clay and chalk was used for the Scales and D. & H. brands, and he hesitated to say that there was any difference in quality between them. There was, no doubt, a reduction in price, but the reason for supplying the D. & H. at a cheaper rate was that the Belgian firm wished to meet Messrs. *INGRAM & CLARKE*, who had stated that their contract was not profitable. Scales was generally the cheaper of the two. About 17,000 tons of D. & H. cement were used by the Belgian Government at Bruges and there were no complaints, and it was never said that the cement set too quickly. Evidence was also given by contractors who had employed some of the cement rejected at the Prescott works to the effect that the cement was not too quick-setting. An expert also declared that from his tests he considered the cement quite suitable for work in the reservoir. One expert, consulted by the Admiralty in connection with harbour works, affirmed that the average tensile strength of a sample was 600 lbs., and the final setting time seven hours, which showed a slow cement. It was finely ground and sound. The tensile strength of another sample was 627 lbs. after seven days, the final setting taking place in thirty minutes. A further sample was received which had a final setting time of seven hours. The cements were adapted for practical purposes. Some briquettes were made from the last sample which stood the most severe test to which they could be subjected without showing any flaws. It is unnecessary to go at further length into the evidence for the plaintiffs.

All that was said must have been considered by lawyers as extraneous to the main point. The counsel for the defendants was acting more reasonably than often occurs when he asked that the case should not be allowed to proceed further. The plaintiffs had obtained a copy of as much of the specification as related to the conditions required for the acceptance of the cement, and knew that the engineer was to be satisfied. To this it was replied that the defendants had allowed about a thousand tons to be delivered, which was turned over and arranged for use, and that was sufficient to show there was satisfaction. The judge adopted that view and the hearing was continued.

For the defendants the resident engineer on the works stated that the second lot of cement was C. Z. instead of D. & H. There was another variety with a blank seal, besides one of a different brand. He described the tests which he had made and by which he was convinced that the cement was too quick-setting for the purposes required. One of the Liverpool Corporation inspectors said that a consignment after being conveyed in waggons from the mixing place to the place of deposit, a journey which occupied thirty-nine minutes, was found to be so hard that it had to be hewn out with picks and iron bars, rewatered and specially treated before it could be put into position. On various occasions the cement had set so quickly, whilst he was making tests, that the thermometers had become firmly embedded in the mass, and many were broken in the effort to remove them. Mr. FRANCIS FOX, one of the engineers of the *Marsey*



Tunnel, said that from its quick-setting qualities he would not allow the cement to be employed on any works with which he was connected. Mr. COTTRELL, engineer of the Liverpool Overhead Railway, gave similar evidence.

After other evidence had been heard and counsel on both sides had delivered addresses, Mr. Justice WALTON submitted the following questions to the jury:—(1) Whether the cement in question—this 1,000 tons—which had been rejected was supplied to the satisfaction of the Liverpool Corporation water engineer? (2) Was it rejected by the engineer? (3) Was it best Portland cement, reasonably fit for making concrete for a reservoir? And (4) on the assumption that the defendants were justified in not accepting it, what compensation ought to be allowed to them for the expense and loss they had suffered? To the first question a negative answer was given. The second, which was the most important, was answered in the affirmative. The jury could not agree on the third, and they awarded 420% in respect of the fourth, which related to the counterclaim.

The plaintiffs' purpose will no doubt be served although the issue was adverse to them. For there was no doubt about the strength of the cement, as it resisted very severe tests. It was, however, needed for a special purpose, and whether it met those requirements or not was to be determined by the engineer. It sometimes happens that with sub-contracts like the one in question the conditions which are binding on the contractor may not affect the sub-contractor, even if the latter knew about them. In this case a copy of the specification relating to the cement had been sent to the plaintiffs. It is not unusual for sub-contractors to give little attention to such documents. So much anxiety is now bestowed on the degree of grinding of cement and on tensile strength, it may be that the quality of setting was not sufficiently considered. But the setting power as well as the strength was left to the engineer without any limitation, and under these circumstances it did not matter whether experts were satisfied or the reverse. To some people it may seem that the importance attached to slow-setting cements is excessive; such an instance as the inspector described of a waggon load of stuff becoming a firm concrete in about forty minutes might have occurred very rarely, and could be explained if all the circumstances were taken into consideration. But it is a general belief among engineers that there is a connection between the setting and the burning, and that slow-setting is really a testimony to proper burning. How far that is true is open to discussion, but those who have to employ cement under difficult circumstances must be allowed to take comprehensive conclusions occasionally without any regard as to whether they are supported by laboratory experiments.

#### ANCIENT COFFERS AND CUPBOARDS.\*

DURING the next week men will be making night hideous in the suburbs of the Metropolis and some of the old-fashioned provincial towns by doleful renderings of "The Mistletoe Bough." That is the tragedy of an oak chest. The story was derived from Italy, but probably it originated in a more distant region. In modern times paper currency, banks and safe deposits have caused the old-fashioned chests to be regarded as lumber. But for many centuries they served an important purpose. There is evidence enough that in antiquity they were used to preserve treasures. One in which CYPSELOS, the tyrant, was concealed, was said to be made of gold, ivory and cedar, and richly carved. In the records of the Mediaeval period we have numerous references to them. Coffers were sometimes adorned with ironwork, enamels and precious stones. Thus in 1295 in the inventory of St. Paul's Cathedral, London, we read, "Duæ coffræ magnæ eburneæ, modo vacuæ." They sometimes were utilised for the secondary purpose of seats. There were also bahuts, or coffres des vaches, which seem to have been boxes covered with leather, and on journeys were carried by horses or mules of special strength, called bahutiers. The evolution of the

chest is suggested by the advancement in social position of the makers. The bahutier or coffrier was only recognised as an artisan; but when the trunks or chests became highly ornamented, and were known as huches or huchels (Sir JOHN MAUNDEVILLE speaks of "The arke or huchche, with the relikes, TYTUS ledde with hym to Rome, when he hac scomfyted alle the jewes"), the huchier was allowed the rank of a painter or sculptor. In Italy at a later period the cassone painter was usually a very able artist, and examples of his skill, which continue to be as brilliant as gold and colours can make them, are among the treasures of various museums. It would be easy to say more on the subject, which is among the most tempting that can be offered to the artist and the archæologist.

Mr. FRED ROE, the painter, is to be congratulated on having successfully employed his pen and pencil in the preparation of an attractive volume on ancient coffers and cupboards. It has occupied him as a labour of love for over seven years, and the result repays so much industry. His style of drawing is well adapted to the portrayal of old work, for both figures and ornament have characteristics which somehow are convincing of their fidelity. His own work is supplemented by photographs, and for once the two classes of representation agree together.

In "Cymbeline" IACHIMO is described as having obtained admission to IMOGEN'S bedchamber by means of a trunk, which he describes as containing a present for the emperor, consisting of plate of rare device and jewels of rich and exquisite form. The princess agreed to take them in protection and to keep them near her. In SHAKESPEARE'S time the use of travelling chests on a large scale had not been superseded. Heavy trunks encased in iron bars were carried about, for their size and weight were thought to make the contents sure. In the preceding century WILLIAM CAXTON, in his advice to travellers, had told them to set household stuffs in their "whutche" or cheste, your jewellis in your forcier, that they be not stolen." We have examples which suggest the variations of those treasures at different periods, and we believe it to be an error when English painters in representing the scene in "Cymbeline," beginning with JAMES BARRY, represent IACHIMO'S trunk as an unadorned chest. The chest known as the coffin of St. CUTHBERT suggests the decoration which was popular in England at the time of the seventh century. Mr. ROE tells us that "the coffin is covered with outlined figures of saints and apostles. In the representation of the Blessed VIRGIN and OUR LORD at the foot of the coffin is a most peculiar flow or following of line which should be noticed by the student of archaic sculpture." Although in the thirteenth century massiveness was held to be desirable, yet, according to Mr. ROE, "the bases of the uprights were sometimes ornamented with representations of dragons and other fabulous monsters grotesquely carved, and towards the end of the Early English period and during the following century this decoration was extended and carried up the stiles in successive storeys or compartments." In many instances very plain coffers are described as "Saxon"; the metalwork may present characteristics which belong to a later period, but it is not always to be assumed that the woodwork is of the same date as the lock plates. It by no means follows, however, that all plain examples are necessarily pre-Norman.

The period that can be illustrated by specimens which are to be taken as authentic extends, on Mr. ROE'S showing, from the thirteenth to the first half of the sixteenth century. He believes that there are in England no older coffers bearing any pretence to decorative carving than those in Graveney, Kent; Clymping, Sussex; and Stoke d'Abernon, Surrey. SHAW gave a sketch of the Clymping example in 1836, but since that time "the feet of this coffer with their beautifully indented patterns have disappeared and the lower edge has been embellished with a piece of new moulding nailed on by the village carpenter." A beautiful chest of thirteenth-century work is found at Newport Church, Essex. The lid on the inside is painted with a figure of CHRIST on the Cross, the VIRGIN MARY, St. PETER, St. JOHN and St. PAUL. Mr. ROE is confident that the heads of the Apostles are portraits, the models being probably religious, who belonged to the same monastery as the painter. What is no less interesting is that oil was

\* *Ancient Coffers and Cupboards: their History and Description from the Earliest Times to the Middle of the Sixteenth Century.* By Fred Roe. (London: Methuen & Co.)



used as a vehicle, and it may be regarded as the earliest English specimen remaining. JAN VAN EYCK died in 1440, and his brother, HUBERT, in 1426. While the Newport example exists the brothers must be considered as the improvers rather than the discoverers of oil-painting. Thirteenth-century armoires are particularly rare. The fine specimen in the sacristy of Bayeux Cathedral is illustrated. It is remarkable mainly for its beautiful metalwork. In Noyon is an armoire of which the framing is of oak, while the shutters are of white wood, in order to afford facilities for the painting of figures. In describing the fourteenth-century examples, it is pointed out that changes in architectural details introduced in churches did not immediately affect the wood-carvers. Illustrations are taken from Oxford, Hackonby, Dersingham, Brancepeth, Alnwick, Faversham, Huttoft, Chevington, &c. Some of these chests are of great richness, and denote wonderful dexterity on the part of the artists.

A most interesting chapter relates to "tilting coffers," and it justifies the sub-heading of "A Forgotten Genius." The fourteenth-century examples are truly Gothic, or, in other words, the ornamentation is suggestive of a series of Gothic windows, as if the receptacles were models of churches; but some examples, or rather parts of examples, exist in which architectural lines, such as arches and rose windows, are ignored, and there are instead panels relating to the history of St. GEORGE, tournaments and other knightly scenes. It is supposed they were executed in this country, but the nationality of the artist or artists cannot be traced. The different panels are discussed in detail by Mr. ROE. On some of the features which are common to them all, he writes:—

The tilting coffers, which have been treated in detail, all possess certain features which are absolutely identical. There is a very uncommon sort of chamfer running throughout the series, which appears in the framework of the lids or the trays with which the coffers are fitted. They are all purely secular, not a sign of ecclesiastical tracery or sacred emblems appearing about them, and though slight changes may be noticed in the armour of the knightly figures, they are not more than might have occurred during the course of a very moderate lifetime. It should be interesting to the student of costume to note that the advancement in the armour depicted on the York coffer is supported by a corresponding increase in the fashion of dagging (resembling vandyking), both being a development of those which are shown on the Kensington panel. The undulations of the ground are represented in the York coffer and the Kensington fragment as being burrowed by animals. This does not happen in the other examples, but the treatment is distinctly alike, grass being indicated in every case by a double slit, which is placed perpendicularly at intervals with conventional regularity. It is not intended for a moment to suggest that all specimens of this type extant emanated from one source. A comparison, however, with others that exist will only tend to strengthen the belief that the York, Harty and Ypres coffers, and the Kensington panel, are by the same art-worker.

The fifteenth century favoured the production of coffers and credences in France. The stalls of Amiens Cathedral present a sculptured record of the domestic furniture of that century, and Mr. ROE remarks that "it is said that most of the nineteenth-century counterfeits in which the French are so clever—credences, settles, armoires and the like—are designed by the dealers from these little representations." Collectors of woodwork will find it advantageous to bear in mind the suggestion when purchasing. In the fifteenth century the importation of foreign furniture into this country became so unlimited, it was necessary to pass an Act of Parliament against such manufactures. The French and Germans must have prospered. Flemish work was abundant along the east coast. With so much rivalry it was only to be expected that the native production languished, and consequently "English chests of architectural design are very scarce—cabinets still scarcer; while armoires are to be counted only by units." In the next century the influence of the Renaissance is to be observed, but while that power was exhibited in the woodwork of one part of this country the Gothic spirit was still operating in another part. The characteristics of a style are consequently not invariably a secure clue to the age of specimens.

A special chapter is devoted by Mr. ROE to the

"linen pattern," which appears to have been in favour during the fifteenth and sixteenth centuries. The origin of it has not been ascertained. A capital at Bridlington Priory was apparently suggested by folded linen, and in sepulchral monuments the robes of ecclesiastics and others are arranged in folds which have more or less analogy to the architectural form. Mr. ROE says that the statues were modelled from standing figures, and were then arranged as supine, regardless of the inconsistency. Opinion is in favour of the linen panel being derived from the Flemings, who were excellent linen-weavers. But Mr. ROE maintains that the earliest known examples are French. The form was much in use in France during the reign of LOUIS XI., 1461-83. His conclusion is that "the notion originated in France, the fashion later on being imported into this country, either through Flanders, or direct during the first few years of peace and international commerce in the early part of the reign of HENRY VII." There are more types than are generally assumed, and a great many are described by Mr. ROE. The modern system of producing the folds is unlike the old, for "the perpendicular ridges or folds are run out in lengths by machinery, and the edges finished after the material has been cut up into the desired sizes."

It is gratifying to find so much archaeological enthusiasm shown by a modern painter. Mr. ROE is not satisfied with the collecting of a few types of coffers and cupboards which might be turned to account by himself and his friends in their pictures. He has pursued his subject patiently over a wide field. The primary purpose of his handsome volume no doubt is to gratify amateurs; but the numerous plates will be found suggestive not only by collectors, but by manufacturers of furniture and architects who may have to design woodwork of the different periods investigated by the author.

#### RENAISSANCE HOUSE AT ORLEANS.

THE bizarre house at Orleans shown in the illustration is said to have belonged to a Calvinist named Jean d'Alibert, and to have been the scene (though there is nothing to authenticate it) of a meeting of the Reformed Church on November 15, 1551. It consists of a front 6 metres (about 19 feet 9 inches) wide, built of stone, the courses averaging a foot in height. It is exactly 12 metres high, double its width, from the street level to the top of the cornice, and is divided into three storeys. The arch over the large ground-floor opening is a genuine one—the line of the extrados being marked—and it is consequently elastic, as an arch should be. The same may be said of the smaller archway. But four other circular arches have vertical joints exactly in their centres where the keystone ought to be, and that these openings are narrow—barely 2 feet—is not a sufficient excuse for simulating the round arch form, since an adjoining window of wider dimensions is securely covered by a genuine stone lintel. A certain thickness of wall is maintained up to the first-floor window-sills, but there it has been deemed advisable to "break up" the front, not with the laudable object of economising materials or strengthening some parts and lessening the weight of others, but for the sake of what is called "effect," which consists in this instance of framing the principal window openings with pilasters and entablatures—five of the former on the first, and the same number on the second floor. The pedestals to these pilasters are 2 inches in projection, and bases, shafts and capitals follow in proportion. Above these are architrave, frieze and cornice, but the architrave (the Greek lintel) instead of supporting is supported, and it is therefore excusably divided into several pieces; the frieze which used to tell the history sometimes of the building, sometimes of the builders, is simply a piece of hewn stone, and the cornice, the use of which was to shade and protect the frieze, having in this case nothing to protect, is utilised as a most imperfect window-sill, upon which the rain can stagnate and the dust rest. In a similar manner the upper window lintels are composed of several pieces of stone. Over the architrave of the second order, in the centre of each pilaster, a console is introduced, obviously for the sake of supporting the cornice, but it does so only in appearance, since a space of 2 inches exists between the top of the console and the bottom of the corona.

Above the large arch of the ground floor is a frame evidently destined for the name and calling of possibly the shop-keeper, but the size of the panel is 2 feet 8 inches by 6 inches, and it is 14 feet from the street level, so the letters 4 inches in height would be hardly legible at that distance from the eye. Exactly in the centre of and over this panel is a head 3 inches across the forehead, with two wings of that variety of the



animal creation popularly known as a cherub. The doorway is a tolerable piece of construction, but its ornaments, and those of the window over it, cannot be easily explained. Two heads, male and female, each 4 inches by 3 inches in size, support an order architrave, frieze and cornice complete, supporting two stone troughs placed on end, out of which issue the thighs, abdomens, shoulders and heads of two figures, each measuring 7 inches in height and nearly 4 inches across the shoulders, their arms being lopped off on a level with the bottom of their chests. These figures support another complete order

which serves as an impost to the imitation arches above. On the top is a *motif de sculpture*, consisting of two female figures measuring 6 inches across the shoulders, without arms, and with satyresque extremities, two ribands, two masks, an urn, four acanthus leaves, and a flower of the same plant, a lion's head and mane, and an arrangement of cut cardboard pierced and twisted into volutes. A lion's head, with a ring in the animal's mouth, is placed under two of the pilasters. The sill of the small window on the first floor is supported by three heads, each two inches across the forehead,



HOUSE IN THE PLACE DU MARCHE A LA VOLAILLE, ORLEANS.



and six wings of cherubim. From their mouths fall two garlands, each consisting of one apple, two pears, and sundry smaller fruit of divers kinds. The false arch is crowned by a false order cut in the height of one stone-course, and above the latter are two sitting female figures, measuring seated about 13 inches; an oval medallion, with nothing on its face; a cherub's head, 4 inches in width; and a pair of wings, with a cardboard background.

### HEREFORD CATHEDRAL.

IN June, 1848, a paper was read before the Ecclesiological, late Cambridge Camden Society, by Mr. Haggitt, M.P., which explains the works of restoration then in progress. He said:—The restoration of this venerable church, which has been in progress for about the last seven years, and is even now far from being completed, has attracted less attention than it undoubtedly merits. We propose now to give some account of this interesting work. The most ancient part of the cathedral of St. Ethelbert is supposed to date as far back as 1030. The nave was entirely Romanesque till the fall of the west tower, together with the west front and great part of the clerestory, in the year 1786; after which the west front was restored by the notorious Mr. Wyatt, in that debased style of which he was so perfect a master, and which was yet less debased and less incongruous than the prevailing styles of that day, while the west tower was not rebuilt at all. The lower row of arches, however, in the nave, which are Romanesque, and are really massive and beautiful, still remain. The north and south aisles are early Middle-Pointed. The choir in the lower part is Romanesque, and in the upper First-Pointed. The choir aisles, with the exception of some arches of Romanesque character, are early Middle-Pointed. There are double transepts, of which the south-west is Romanesque, being the most ancient part of the church (some Third-Pointed windows, which have been inserted, being excepted), and the north-west is early Middle-Pointed, having triangular-headed arches and windows. The lady chapel is First-Pointed, and underneath it is a crypt of about the same date. Two Third-Pointed chapels remain, one opening into the lady chapel, and the other into the north choir aisle. The central tower is First-Pointed and very massive; it is supported on four Romanesque arches at the point of intersection of the choir and nave with the principal transepts.

Thus the church is highly interesting to the antiquary, from the number of different styles it contains; whilst to the more devotional mind of the ecclesiologist it will, we trust, when thoroughly renovated, convey that solemn and religious impression, the existence of which is so true a test of the real success of church-building or restoration; nor, we may hope, will the mere careless spectator or thoughtless visitor be able to leave it without some passing feeling of reverence.

The repairs were commenced in 1841, when the dangerous state of the piers which support the tower became apparent. The most remarkable circumstance about their unsound condition was that—unlike most similar cases—it was owing to the fault of Mediæval and not modern builders. A low Romanesque tower had been taken down and replaced about the end of the thirteenth or the beginning of the fourteenth century by a very large and massive First-Pointed tower, built on the same piers. "The consequence was"—we quote from the able statement of the Dean of Hereford—"that no sooner was the tower finished than the pressure upon these piers, composed of a central or internal mass of rubble, constituting the core, and this faced or cased with worked stone called ashlar, soon began to manifest its effects; the weight so compressed the core that it destroyed its cohesion and tenacity, and reduced it in many parts to almost powder, and this being by the weight above thrust against the outward casing caused it to crack and split in every direction, and in various places to bulge out in the most frightful manner." Unwilling or unable to attempt the rebuilding of the whole, those who had the direction of the repairs of the church at that period devoted their energies to keeping up the tower as it was. "They began by drawing from the bottom the old and failing stones, and replaced them with larger pieces of the closest and hardest they could obtain. This was practicable to some little height, but there they found that the enormous weight above them was so doing its destructive work that they were necessarily obliged to adopt a different expedient. . . . The mode which they adopted was this. They formed with much labour and cost stones of about 12 or 14 inches thick in the exterior portion, having in the interior at each end cogs or projections of about a foot cube; then they took out of the old Norman wall stones corresponding in size with these cogs, and thus the weight of the superincumbent masonry tied these in, whilst the stones against the face of the wall counteracted the tendency to bulge. All these stones were cramped in transversely and vertically in different places by lead and iron."

The complete restoration of the tower was a stupendous

task. It took nearly four years, and a cost of about 11,000*l.* has, we believe, been incurred, including the expense of examination, in securing it from falling during the works and completing its repairs. It was necessary to excavate between the piers from north to south on either side of the tower to the depth of 10 feet, and to fill the cavities with concrete. Not only the interior of the base of the tower was strengthened in this manner, but on the south and east sides an area of 32 feet by 23 feet in each was so dealt with, and a somewhat smaller area also on the north side. Another very important cause of the dangerous state of the tower, and of that part of the building which adjoined the lantern, was that some of the arches had been weakened by the mistaken plan of building up within them, with the intention of supporting them. Mechanical principles appear to have been very imperfectly understood at Hereford, or no such grievous piece of folly would ever have been perpetrated. These unsightly and destructive masses of stone and mortar have also been removed. The piers have been restored, and the tower put in thorough repair; and the internal columns of the lantern being now visible form a very striking feature of this part of the building. A ceiling has been introduced, handsomely painted—a proof, we hope, that the whole of the interior decorations are to be executed with becoming richness and magnificence.

In order to convey some idea of the interior of the cathedral, as it will appear when restored according to the plan proposed, we will briefly describe it, beginning from the west end and proceeding onwards to the lady chapel. It is a small cathedral, one of the smallest, we believe, in England. We have before said that the west end of the church was rebuilt by Mr. Wyatt. The door and the window above it are, as might be expected, as inappropriate and as incorrect as anything (except a square-headed door and window of the Grecian style) could well be. On entering the nave, one would be at once struck with the massive beauty of the columns and arches, which are Romanesque, and have not been much injured except by whitewash. The clerestory, however, is Mr. Wyatt's, though somewhat less bad than the west door and window. The nave when completed will contain oak seats for the congregation; and a stone pulpit is to be erected against the north-west pier of the tower. The screen between the nave and choir, which will most probably be placed west of the lantern, is to be of open work. We need not say how highly we approve of this arrangement; the old system of packing the whole congregation into the choir, and leaving the nave empty and almost useless, is so monstrous that one would think it must in the end work out its own reformation; but we are anxious to express our hope that the revived plan of putting the laity in the nave will be fully carried out, and that the choir will be reserved exclusively for the cathedral body, consisting of clergy, lay-clerks and choristers; and that the congregation will be kept entirely to the nave (entering the choir only for the purpose of receiving the Holy Communion) whether a large or small number be assembled.

We make this remark because we believe it has been proposed, and almost fear it is intended, to admit the people into the choir at all times, but to fit up the nave so as to accommodate the greater numbers which may reasonably be expected to be present on Sundays, church festivals, visitations, and other important occasions. The choir is a small one, and will not be too large for the cathedral body (if they attend the services as they ought), and we earnestly hope that the Dean and Chapter will adopt the one right system of church arrangement, and adhere to it steadily and firmly.

The north-west transept is of early Middle-Pointed character, the windows being triangular-headed. It was built towards the beginning of the fourteenth century for the reception of the shrine of St. Thomas de Cantilupe, whose body had previously been interred in the lady chapel, from which it was removed into this transept, where the tomb still stands, though the relics of the saint are no longer beneath it. The transept was used till the commencement of the repairs as a parish church, and has in consequence been much damaged by the cutting through the columns to receive the timbers of the galleries and stopping in the fissures so cut with brickwork, by attaching mural tablets to the walls, and by the rest of the modern fittings. It is to be thoroughly repaired, and the arches and windows (now in an unsafe state) to be made secure, and the whitewash to be cleaned off. The south-west transept is (with the exception of some arches in the choir aisles of about the same date) the most ancient part of the cathedral. It is a fine piece of Romanesque work. In its east wall is a large fissure, which will of course render a careful repair of the wall necessary. The west wall has, like the east, been very much injured by the erection of mural tablets against it, and it is now in an unsound state. There are an ancient fireplace and aumbry in this wall, which are to be restored. Some Third-Pointed windows have been inserted in the transept.

The entrance to the choir is to be "by gates of wrought metal, forming part of an open screen of metalwork."



Formerly there was a stone wall separating the choir and nave, and the organ was placed upon it. Of course the new arrangement is infinitely preferable; the organ will be placed on the side, probably in the north transept. The choir will contain all the proper fittings. The ancient carved oak stalls and throne are to be repaired; and we find among the various items the following:—"A new communion table of suitable and approved character, according to design, to be placed at the east end;" and again, "A rich covering for communion table." Now we really trust that this, translated into Catholic phraseology, means an appropriate altar suitably vested. The steps are to be of Purbeck marble polished. There was formerly a horribly ugly Grecian screen at the east end of the choir, and above it a debased window, filled with painted glass, representing the Last Supper, the offspring of private munificence (unhappily misapplied, for the painted glass was very bad). This has all been removed. A noble Romanesque arch now forms the eastern extremity of the choir, and above it has been inserted a triple window, enriched with the tooth ornament and beautiful in detail, which will be filled with stained glass. We hope an appropriate reredos will be placed behind the altar. In a drawing which came out a few years ago, the only reredos was a sort of open arcade; but this design, we are glad to find, is to be altered, and a proper one erected.

The Dean of Hereford informs us that very lately there have been discovered some traces of three apsidal terminations to the choir and choir-aisles of the Romanesque church before the building of the present lady chapel.

The north-east transept contains some debased windows, and therefore is not one of the most beautiful parts of the church. This also is to be duly restored, as is the ambulatory between the choir, lady chapel and transepts. In the south-east transept some modern windows are to be taken out and reinstated in stonework.

The lady chapel is a well-known specimen of First-Pointed architecture. It had been used previously to the commencement of the repairs as a library, but will, we hope, when completed be duly fitted up with an altar, and used for such services of the church as may be more properly and conveniently performed in it than in the choir, such as early communions, early morning or late evening prayers.

There are five beautiful lancet windows at the east end, which are to be filled with rich stained glass of design in character with the date of the chapel; a handsome wheel-window above these has also been restored. The roof has been raised. We trust the lady chapel will be restored in full accordance with the remaining traces of its ancient beauty. There is a small Third-Pointed chapel opening into it on the south side, supposed to have been commenced by Bishop Audley about 1495, and probably completed by his successor. It contains together with the stone screen, which separates it from the lady chapel, some ancient painting. Some remains also of figures painted over some of the tombs are visible. A double piscina has been beautifully restored.

We are sorry to see the ceiling, both in the choir and lady chapel, instead of being richly painted, covered with cement jointed so as to imitate stone, and coloured so as to imitate particularly that reddish stone which has been used for most of the repairs. This, of course, we dislike, because we abhor all imitations, whether of a good, bad, or indifferent character, and we think they are contrary to the principles of all good taste. In a church, however, they are especially objectionable, and accord but little with the stern reality of that religion which churches should symbolise. This is undoubtedly a good imitation, but that circumstance does not remove the objection to it; besides which, we do not think that even real stonework, left bare and unornamented, would be the best way of finishing the roof. We hope, then, that this defect may be at some future time corrected.

There are some encaustic tiles at the east end of the lady chapel; these are to be relaid and made good, where defective, with tiles of corresponding design; and the whole of the chapel will be paved with new tiles, as will also the ante-chapel (from which there is to be a flight of stone steps leading up to the lady chapel); and, if we understand rightly, the whole of the cathedral is to be similarly paved, the tiles in the choir being, of course, of a richer character. We hope that in the sacristy, at least, they will be coloured.

The crypt, which is under the lady chapel and communicates with it by steps, is an ancient one. It contains in the middle a tomb, with the figures of a man and woman engraved on it, the date being 1497. We are not aware that anything is to be done to the crypt. Having mentioned the subject of tombs, we may add that in this, as in most old churches, there are many beautiful monuments, effigies of bishops and other churchmen of the Mediaeval times, presenting that striking contrast to the semi-heathen designs so prevalent in modern days, which contrast, remarkable as it is in all the various details of ecclesiastical art, is nowhere more so than in comparing the different kinds of memorials which the past and present ages have assigned to the departed.

The exterior of the roof of the choir and lady chapel has been newly covered with lead, and along the ridge of it runs a metal crest with the inscription "Laudate Dominum." There is a handsome, though much too heavy, gable cross at the east end. The lady chapel, viewed from the exterior, appears half detached from the rest of the church, part of the building connecting it being a good deal lower than the chapel itself. At the eastern gable of the choir a beautiful and massive cross has been erected, under which, and opening into the space between the roof and inner ceiling, is a trefoiled window, and a little below it, on either side, a panel cross has been very well carved on the wall. Under these again appears the triple window before mentioned. Two pinnacles of rather elaborate design complete this gable.

With the exception, however, of the view of the east end of the choir and lady chapel, the exterior appearance of the cathedral is less pleasing than that of the interior of the building. The incongruity of the various parts forces itself strongly on our notice, and the west end is (it would seem) irremediably spoilt; but the huge tower forms a very beautiful and imposing feature.

One sad drawback to the restoration exists—the want of funds. Above 20,000*l.* have been subscribed or promised; but at least 12,000*l.* more are requisite for the completion of the work; and it is to be hoped that the liberality of zealous churchmen will be directed to this object. It deserves their attention, for an attempt is here being made to revive the true church arrangement and a due celebration of the Holy Services; and it is to the success (under the blessing of Providence) of endeavours of this kind in places so well fitted for them as our ancient cathedrals, that we must look for the recovery of so many who have wandered from the path of obedience. Only let this and all cathedrals be more thoroughly adapted to the wants of the people, by throwing open to all alike the advantages of increased accommodation for worshippers, and by bringing home to their hearts all-important truths and all-important practices of devotion, through the medium of their constant services and solemn ceremonies—and, we may add, by the noblest application of the most sublime of the arts, sound ecclesiastical music (eminently fitted as this much despised and neglected style of music is for devout worship)—and we may then trust that the Church will be again, as in bygone ages, loved and obeyed by all, to the discomfiture of heresy whether existing within or without her pale.

#### MEMORIAL TO QUEEN VICTORIA.

THE memorial to Queen Victoria in St. Mildred's Church, Whippingham, Isle of Wight, which is being erected as a tribute of affection by the King and Queen and other members of the Royal family, and with which the German Emperor has personally associated himself, is now approaching completion. It takes the form of a reredos with ornamental panels, and the decoration of the chancel generally. This beautiful work has been carried out from designs and under the superintendence of Mr. A. Nutt, the architect who designed the Coronation annexe for Westminster Abbey. The distinctive feature of the reredos, which has been worked in alabaster, is a central panel depicting the Last Supper, all the figures in which are wrought of the purest white marble. On either side is a miniature panel, the one denoting the sacred emblems of the Bread and the other the Wine, represented by wheat ears in white marble, and a bunch of grapes, also in white marble. There are two larger panels representing the Alpha, with the words, "Holy, holy, Lord God Almighty," and the other the Omega, with the inscription, "Heaven and earth are full of Thy glory." The steps approaching the altar are of Belgian granite. A figure of the patron saint of the church of St. Mildred in embossed stone fills a niche at the side of the reredos, and on the corresponding side is a figure of St. Catherine. The effect in each case is enhanced by the introduction of tiny red marble shafts or pillars. On either side the new oaken roof above the sanctuary are figures of three angels representing the heavenly host, artistically produced in gilt and Oriental colouring, each bearing a scroll, whilst conspicuously near is the appropriate inscription, "Holy, holy, holy." A new stall, with oak tracery doors, has been placed opposite the Battenberg memorial chapel in the chancel. In former days this stall was occasionally used by the late Queen Victoria and other members of the Royal family when the Court was in residence at Osborne.

A New Church dedicated to St. Mary and All Saints, which has been erected for the Palfrey district at Walsall at a cost of about 6,285*l.*, was consecrated on the 13th inst. The new building, which will accommodate about 700 people, has been erected by Mr. W. Hopkins (Birmingham) from the plans of Messrs. Cutts (London).



## NOTES AND COMMENTS.

A GREAT many of the older churches of Europe possess objects of which the history is not easily traced. In some cases they have been found in the course of time to possess historic interest. The Elizabethan stoup which was discovered in 1862 under the pulpit of Malling Church, Kent, has no doubt a history, although at present there is no clue to the original ownership or how or why it found its way to the church. It is of Delft ware, stands about 10 inches high, and is decorated with figures that may represent heathen beings, but are without Christian symbolism. It bears the date of 1581, and therefore belongs to the reign of Queen ELIZABETH. At that period there was occasionally indifference about the character of the vessels used in church services, and the stoup of pottery might be deemed as becoming as any vessel of silver. All that can be stated about it is that it was never used since 1780. In Malling Church it is only a curiosity, but a collector has offered 500*l.* for the jug. There is always need for money to carry out improvements, and the parish of Malling is no exception. A Consistory Court was held on Saturday at which the vicar and churchwardens applied for a faculty to dispose of the stoup. The only opposition was by Mr. PAINE, the secretary of the Kent Archæological Society, who argued that such objects ought not to be allowed to be withdrawn from the parish or church to which they belong. Earl STANHOPE, who is president of the Society, wrote a letter expressing approval of the sale, and which therefore demonstrated that archæologists were divided on the question. Dr. TRISTRAM granted the faculty for the sale, and said the objection to parting with such articles in order to pay for improvements could not now hold good.

THE Ordnance Survey is national property, and accordingly a general use of the sheets is advantageous. There is uniformity, and, all things considered, the correctness of the maps is remarkable. Surveyors have some reason to grumble when they find the maps are preferred to special surveys, but they have to admit that they cannot compete in price with Ordnance work, and in the present condition of the estate market economy, even in mapping, cannot be neglected. The question of copyright is, however, imagined to affect the reproduction of the maps. It is common to see exact copies of particular districts in local guide-books. But in such cases it is supposed the public tacitly insist on faithful copies of the maps. When maps are employed by auctioneers as illustrations of their particulars of sale, it is believed by some that only the interests of individuals are served, and there has been much misgiving whether the direct reproduction is not a breach of copyright. Some correspondence has been carried on between the Auctioneers' Institute and the Stationery Office on the matter. It has been at last conceded by the authorities that henceforth it will not be necessary to make an application in every instance when an auctioneer desires to reproduce a part of the Survey, but the following conditions will have to be observed:—(1) That the source from which any reproduction is taken is duly acknowledged on the face of each copy in the following terms:—"Reproduced from the Ordnance Survey Map with the sanction of the Controller of H.M. Stationery Office." (2) That the map as reproduced is not placed on sale, but is only used for the purpose of particulars of land sales. (3) That a copy of the map as reproduced is in every case forwarded to the Director-General, Ordnance Survey, Southampton, and that another copy will, if demanded, be forwarded to the Board of Agriculture, 4 Whitehall Place, London, S.W.

WESTMINSTER ABBEY is no doubt a church of England subject to the laws in common with other churches, but it must also be treated as our grandest historical memorial. It would have been a great advantage if the German example were followed and the building allowed to remain in its pre-Reformation state. We suppose it is too late now to expect a general acceptance of that mode of treatment, and on that account Lord KINNAIRD was justified in asking why a stone altar and a crucifix, together with two figures of saints, were removed from another place and set up at the shrine of EDWARD THE CONFESSOR. In such a case the Dean and Chapter are responsible, and the Office of Works could not interfere. Indeed, it might easily be

inferred from the recent ceremonies the peculiar position in which Westminster Abbey is placed. The Lord Chancellor was able to point out that in the Abbey, as in less important churches, three male persons of full age could complain to the Bishop about any new ornament introduced, and the Public Worship Act would then be set in motion. Probably nobody who was not strongly moved by the love of self-advertising would venture on the course indicated by the Lord Chancellor. There is no doubt the scenic effect of the Abbey as a Mediaeval building is enhanced by accessories like those complained of, and the time is past when they could be condemned as aids to idolatry.

In several quarters of Paris there are shopkeepers who make it a rule to respect Sunday by the closing of their premises. Although the greater part of a street may recall on those occasions the streets of London, men are generally at work either on the erection of new buildings, reparations or street works, such as altering the roadway. Repetitions of the same scene compel the visitor to come to the conclusion that for anyone engaged in construction there is no respite. No men work harder than those belonging to the building trades, and it seems extraordinary that they should be so severely treated. There are several reasons for the perpetual toil. Many of the workmen belong to the provinces; they are employed in Paris only for a few months, after which they return. They consequently wish to earn as much money as they can in a short time, and they console themselves with the reflection that in the dead season there will be Sundays enough to repose in. Then there are many improvident workmen who would be opposed to any cessation of labour. On the other hand, there are numerous contractors and men who would gladly see a better arrangement of the week. That spirit has been strong enough to have the subject discussed at great length at the Builders' Congress which has just been held in Paris. Reports are to be prepared on the question, but the ordinary contractor will be unable to allow his men a respite from labour so long as the State and the municipality insist on regarding all the days of the week as alike.

THE island of Thera in the Grecian Archipelago is somewhat barren, owing to the prevalence of pumice stone, and the effect is increased by the number of dwellings which are cut out of the rock, and might therefore be regarded as cave-dwellings. But the island has some archæological importance. The Phœnicians owned it at one period, and wherever they settled there is a likelihood of discovering examples of primitive art. It was also connected for a time with Sparta. However, the dreariness of the island deterred archæologists until the German explorer HILLER VON GAERTRINGEN, in the summer of this year, undertook the task of investigating the chief town. He ascertained that the Byzantine church has been erected mainly with antique masonry. From inscriptions, it is evident that the stones were derived partly from a marketplace and partly from a temple dedicated to BACCHUS. The explorer, being anxious to perform the work systematically, has endeavoured to make a plan of the town. This has been an exceedingly onerous undertaking, owing to the number of wretched dwellings which occupy the sites of the ancient houses. An immense number of inscriptions have been met with, some of them in positions to which it was difficult to climb. All the remains discovered by Herr HILLER VON GAERTRINGEN have been deposited in an improvised building which serves as a museum.

## ILLUSTRATIONS.

STELLING HALL, STOCKFIELD, AND SOUTH FRONT.

SEMI-DETACHED HOUSES, WESTGATE-ON-SEA.

"THE OBSERVATORY," WESTGATE-ON-SEA.

COACHMAKERS' HALL, NOBLE STREET.

CATHEDRAL SERIES: HEREFORD.—CORNER OF NORTH TRANSEPT, GARGOYLE IN CLOISTERS.

THE title of the Board school published last week should have been "Higher Grade Board School, Cassland Road, Hackney." Messrs. LAWRENCE & SON were the builders, and the architect Mr. T. J. BAILEY.



## ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A MEETING of the Institute of Architects was held on Monday evening last, Mr. Aston Webb, A.R.A., president, in the chair.

Dr. A. J. EVANS read a paper entitled

## A Bird's-eye View of the Minóan Palace of Knossos, Crete.

He said that after three campaigns of excavation, begun in 1900, it was now possible to speak with some confidence of the main lines of the great prehistoric palace that it had been his lot to bring to light on the site of Knossos. The magnitude of the work could be judged from the fact that between four and five acres of the building had now been uncovered, and in some parts the area had been practically doubled, so far as architectural results were concerned, by the recovery of extensive remains of upper storeys. Great assistance had been given to him through the Cretan Exploration Fund, and he gladly seized the occasion of heartily thanking the Institute for its liberal contribution; but the annual amount to be covered, over and above the assistance given, had still been necessarily large. In carrying out the work he had been specially fortunate in securing the services of Dr. Duncan Mackenzie and of Mr. Theodore Fyfe, as to the excellence of whose architectural plans and drawings the Institute had that evening an opportunity of judging.

Reviewing the construction of the palace and its general design and distribution, Dr. Evans stated that in outline the palace very nearly approached a square form with an oblong central court and apparently four main entrances roughly answering to the points of the compass. To the west were the remains of a paved court with altar bases and raised causeways. Along the base of the palace wall was a raised plinth which seemed also to have been used as a seat, and there was every indication that this was the principal gathering-place of the people—the Agora—where king and citizens would most naturally have met. Here was the state entrance, a lofty porch flanked by fresco paintings of which bulls formed a principal feature, and giving access to two imposing entrances. One of these opened into a magnificent corridor, the other to a chamber at whose portal one might well believe the king sat in judgment before the assembled people in the Agora beyond.

The entrance corridor contained remains of a great processional fresco—men in long robes, priests or princes, youths carrying vases, apparently tribute-bearers, the lower borders of the robes of a brilliantly-apparelled lady, perhaps a queen. Evidence was forthcoming of the continuation of this "Corridor of the Procession" along the upper terrace of the southern face of the palace. By this means a covered line of passage was secured between the state entrance on the west and the eastern quarter of the palace, passing the southern entrance, and looking out on the south end of the central court.

The more immediate objective of the entrance corridor from the west was to be found in the remains of a propylæum overlooking the southern terrace. This propylæum was originally entered by three doorways, giving access to a kind of fore-hall containing two column bases.

The same system of processional figures that characterised the walls of the entrance corridor from the west was continued on those of the columnar hall. The elegant pose of the youth bending back to support the weight of the tall painted silver vase that he bears with both hands, the brilliantly decorated belt and embroidered loin-clothing, but above all his finely cut features, of a dark South European type not yet extinct in Crete, combine to stamp this as the finest example of figure painting that had survived from prehistoric Greece. Two remarkable fragments show a part of a head, with a fleur-de-lis crown, and a male torso, naturalistically moulded, wearing a fleur-de-lis collar.

This southern propylæum gives access to a small court with an altar-base, beyond which, in the present state of the remains, was visible a somewhat complicated block of small rooms. Many of them seemed to have served as the offices of palace functionaries, and contained deposits of their clay archives, accounts, and other documents in a highly developed system of writing about a thousand years earlier than the first written records of historic Greece. Other small chambers were used as stores for fine stone vases, or as cellars containing vats and tall jars, once filled with oil or wine. This block of ground-floor or basement rooms flanked the west side of the central court, the floor level being four steps down from it. On its inner or western side the block was flanked by a fine paved corridor, upon which opened a succession of eighteen magazines, many of them with their rows of huge oil jars—large enough to have accommodated the forty thieves—still ranged in order against their walls. Beneath the paved floor on which rested the jars were double tiers of stone chests, lined with lead, which may have been constructed with a view to securing treasure.

The existing remains of upper blocks show that the whole of this region was originally surmounted by a more important

upper storey. The distribution of these upper blocks, as well as the inner lines of the lower walls and supporting pillars in the central part of this area, show that an important hall ran down it, the general outline of which can, to a great extent, be recovered. It almost exactly corresponds in arrangement with the great Megaron of the contemporary palace excavated by the Italian Mission at Phaistos, on the southern side of Crete. The face of this hall rose opposite the propylæum, and it was approached either by a ramp or, as at Phaistos, by a flight of steps that has since disappeared—this particular portion of the site having been much denuded.

A most interesting room in this part of the palace was the room of the throne, discovered—though at but a small depth from the surface of the ground—in a surprising state of preservation. The remains of the frescoes, wingless griffins with peacock plumes against a landscape background of somewhat Nilotic aspect, were still clinging to the wall. Gypsum benches were ranged on three sides round the well-paved floor, which still showed traces of its central square of red-painted plaster. In the centre of the north wall, between two lower benches, rose the gypsum throne with its high leaf-shaped back—it was once covered with coloured designs—its shapely seat, its lower arches and crocketed moulding, so strangely anticipative of Gothic architecture. Opposite, giving light to the whole, was an impluvium, except for the inverted lines of its supporting columns, almost Pompeian in character, with steps descending to an oblong basin beneath the light well, which may have served as a shallow bath. The wooden columns were found in their sockets in a carbonised condition, but together with the upper part of the walls and the roof they had now, in accordance with Dr. Evans's directions, been restored by Mr. Fyfe after a wall-painting of a small shrine found in the palace, so that this little gem of Knossian architecture has been definitely rescued from destruction.

Of the importance of the great Megaron, and its magnificent decoration, the contents of the basement spaces bear ample witness. Here were found not only pieces of bull reliefs analogous to those from the northern entrance, but remains of painted human figures, both male and female, moulded in high relief in gesso duro, and showing in their reproduction not only of the general contour, but of the individual muscles, sinews and veins, an extraordinary fidelity to nature. Fragmentary as they are, they represent the highest achievement of stucco relief by the Minóan artists, and found their fitting place in the largest palace hall.

Having given a description of the "Hall of the Colonnades," one of the finest features of the building, and the staircase—flights of stairs, in one case flanked by a balustrade, leading from one storey to another—a discovery, Dr. Evans considered, probably unparalleled in the history of excavation, the author next treated of what was obviously the domestic quarter. The centre of interest here was a very original chamber, called by the author the "Queen's Megaron," which was approached through double doorways by a crooked passage from the "Hall of the Double Axes."\* It was divided into two parts by a stylobate, with pillars at intervals on a central ledge, leaving ample openings for light, and which showed on each side of it remains of a shapely bench of wood and plaster.

A small private staircase leads up by two flights of stone steps from the Queen's Megaron to the chambers, still partly traceable above this room and the adjoining hall of the double axes. There are indications that this staircase was continued to a still higher storey. On the west an upper and lower passage leads to a complicated series of rooms originally provided on one side with a wooden staircase, which seem to have been used as sleeping-rooms and for other domestic purposes. There is here a small court suggestively marked with the distaff sign; an inner room where valuables seem to have been stored, of which various traces, including a gold heart and parts of a crystal bowl, were found, and other rooms which may have served as bedrooms, including one off which opens the nearest approach to a modern water-closet yet found in any ancient site. There is here, besides the passage to the main drain, an actual flush-pipe and there are traces of a wooden seat.

Nothing, indeed, is more extraordinary than the remains of an elaborate drainage system existing throughout all this section. The limestone slabs of sections of the pavement, the pillar bases and door jambs, walls with painted stucco still adhering to them—in one case even a stone bench in position—are here preserved on the upper-storey level. From these floors a succession of stone shafts—one apparently connected with another latrine—descend to a network of stone ducts, large enough for a man to make his way along them, beneath the floor-level below. It may be added that near the olive press area were found fine terra-cotta drain-pipes fitted into each other with stop-ridges and internal collars to grip the

\* One of the largest existing halls of the palace, and named from the signs repeated on its limestone blocks.



cement, which in some respects seem to equal the most modern forms, though following out a different principle.

Very animated paintings representing scenes from the bull-ring, in some of which female toreadors took part, formed a favourite subject of the palace wall-paintings. The room above the "Queen's Megaron" seems to have been adorned with miniature designs of this class.

Dealing with the general design and construction of the building, Dr. Evans brought out some remarkable contrasts presented by the palace of Knossos when compared with the palaces of Tiryns and Mycenæ, showing that in the former, unlike the Mycenaean palaces, everything was arranged according to the most elaborate planning, the whole outline being laid down in definite lines without regard to the site—or, rather, a site seemed to have been chosen which allowed free scope of action to architect and engineer.

Another point dwelt on was the striking resemblance in plan between the Knossos building and the palace of Phæstos—among known buildings the only real parallel. Summing up, Dr. Evans said that it was impossible, in view of the fundamental arrangement revealed by those buildings—pointing in both cases to a more or less square building with central court crossed at right angles by two main lines of approach—not to recall the familiar features of the Roman camp, and its still more remote prototype as traced by Chierici and Pigorini in the prehistoric pile-settlement, the "Terremare" of the Po Valley. The quadrilateral form, the orientation, the existence of *Cardo* and *Decumanus* and their parallel lines, and the inner court itself were points of comparison of a very suggestive kind, and seemed to point to an ancient European system of arrangement, sister forms of which were preserved by prehistoric Crete as well as Italy.

The palaces of Knossos and of Phæstos belonged in their existing shape approximately to the same period. That period, as shown by the earliest remains of vases and other relics found above the floor-levels in each case, was somewhat more remote than that to which Mycenæ has given a name, though in both cases modifications of the building were carried out during the Mycenaean period proper. The best positive chronological data is supplied by the lid of an Egyptian alabastron found with remains of indigenous stone vases belonging to the Early Palace period on a floor-level near the northern hall. The lid has a beautifully cut cartouche of King Khyan, of the fifteenth dynasty, who was the principal ruler of the foreign or Hyksos conquerors in the Nile Valley. He seems to have reigned about the eighteenth century B.C., and, considering the rarity of his monuments in Egypt itself, it is difficult to suppose that objects with the name of this Pharaoh could have reached Crete at a later date.

The high level of civilisation reached in Minôan Knossos by the date of the foundation of the existing palace, so conspicuous alike in its architecture and decoration, points itself to long centuries of earlier development. It is not surprising, therefore, to find beneath the later foundations the remains of a still earlier palace, the lines of which seem partly to have been followed in the later work. The thirteenth dynasty monuments—not later than 2100 B.C.—found beneath the pavement of the central court, seem to belong to this earlier building, and a series of exquisite painted vases of eggshell fabric, in design and colouring never certainly surpassed, point, together with other relics, to an intimate acquaintance with twelfth dynasty designs, going back therefore to about 2800 B.C. But beyond this, again, we have evidence of still earlier princely occupation, and fragments of imported Egyptian vases of diorite and obsidian that take us well back into the fourth millennium before our era. And still before this, underlying the whole hilltop on which the palace stands, is a vast Neolithic settlement replete with stone weapons and implements, of primitive pottery and idols, as were later supplied by ancient intercourse with Egypt, which carries back the antiquity of the site beyond the limits of such records.

Mr. W. E. F. MACMILLAN, who proposed a vote of thanks to Dr. Evans for his paper, said he had been told that the Institute concerned itself more with architecture than with archaeology, but on listening to the paper, illustrated by the drawings of Mr. Fyfe, he thought they would all agree that the problems raised in the Knossos Palace excavations were largely architectural. There was, however, still much left for archaeologists as well as architects to do. The work of excavating would continue for another season, but as yet they lacked the necessary funds to carry it out.

Mr. R. PHENE SPIERS seconded the motion. He said it appeared to him from the specimens of work shown them on the screen that the further back they went in the date the purer and finer seemed the examples of art, as with the earlier Egyptian tombs in their decoration. The plan of the temple of Knossos was very interesting, and he thought that if seen alone and without any information it might be taken as the result of excavations in Rome, and would have passed as the palace of the Cæsars. It was probable that the upper walls, being largely composed of rubble with clay, when they fell down

helped to preserve the lower portions of the building and the frescoes.

Mr. THEODORE FYFE explained the slides shown on the screen from his drawings of some of the stucco fragments.

Mr. D. J. HOGARTH supported the vote of thanks.

Dr. EVANS, in briefly replying, expressed his indebtedness to Mr. Fyfe for his skilful work on the site of Knossos. In view of the interest taken in the work the Council of the Royal Academy had consented to allow an exhibition of the drawings, plans and some casts at their winter exhibition, so that those who wished could examine the details at their leisure.

## CLAVERLEY CHURCH.

A PAPER was lately read before the Archaeological Institute by Mr. Philip M. Johnston, architect, upon some late twelfth-century paintings recently discovered in the church of All Saints, Claverley, Shropshire. The church, which lies about seven miles east of Bridgnorth, owes its foundation or rebuilding to Earl Roger de Montgomery, who was constable of the Castle of Bridgnorth. He commanded the mercenaries of the Conqueror's army at Senlac, and was rewarded with large estates in Shropshire and other counties. It is recorded that he and his countess built a church in Quatford in honour of our Lord Jesus Christ and St. Mary Magdalen and all the saints of God, and that they endowed their foundation of six canons with certain lands and churches, Claverley Church among others, the vicar of Claverley being appointed dean of the chapter. Some traces of the eleventh-century church are to be seen in walls and string-courses in the interior of the nave. It was an aisleless building, probably terminating in an apse. The aisle on the north of the nave and a tower on its south side were added about 1140 and 1170 respectively, while the south aisle, the choir and its chapels and other features belong to various dates from the thirteenth to the fifteenth century. The paintings which formed the subject of the paper were brought to light during the restoration in the early part of the present year. They are of unique interest on account of their exceptionally early date (c. 1170) and the principal subject represented. This is nothing more nor less than an incident in the battle of Senlac. Parts of the same scheme of paintings occur on the internal walls of the tower and round the pointed arch by which it opens to the nave; but the most prominent portion is a strip, about 40 feet long by 5 feet broad, above the north arcade of the nave. On this are depicted thirteen horses and their riders, engaged for the most part *vis-à-vis* in pairs, some armed with swords, but the majority with lances. Their horses are coloured red, yellow, pink and white, with green dappling. The costumes of the figures present a general resemblance to those of the Bayeux tapestry, and, after allowing for the interval of time between the two works, they are remarkably alike in treatment. The knights wear masled armour, similar to that which appears, with other varieties, in the tapestry. Their mail shirts are combined with leg-coverings as far as the knees, and leggings of similar character appear below. Over their armour they have surcoats of the kind that came into fashion in the latter part of the twelfth century, and they mostly wear the flat-topped helmet with barred and grated vizor that we find on the seals of Richard I. Another mark of date appears in the kite-shaped shields of the modified shape in use in the second half of the twelfth century; while the horse trappings and saddles of quilted leather all point to the same period. At intervals between the combatants are conventional trees, curiously reminiscent of those in the tapestry. In the centre of this strip a knight is shown unhorsing his opponent, the latter being represented as a gigantic figure tumbling on his head, with his legs in the air. This incident, evidently intended as the motif of the painting, suggested to the vicar of Claverley (Rev. T. W. Harvey) a clue to the meaning of the whole, viz. that the painting is a pictorial representation of the personal encounter recorded in the "Roman de Rou" between Roger de Montgomery and a gigantic Englishman, captain of 100 men. If this be the true explanation of this remarkable painting it possesses an interest that can only be described as unique. To account for its existence upon the walls of this church it must be remembered that Earl Roger was the builder of the church and the founder of the chapter of canons associated with it, and also that by the ruling caste and their clergy the Norman Conquest had been invested with a semi-religious halo; it had not only been solemnly blessed by the Pope, but had received the sanction of success. The other paintings in the spandrels of the arcade and elsewhere are of a more ordinary character—incidents in the lives of saints, the torments of hell, figures of the seraphim, &c. The borderings throughout are of a very elaborate character, red, yellow and pink being the colours principally used. Mr. Johnston, who exhibited full-size cartoons of the principal subject, coloured to represent the original, described the steps that had been taken for the preservation of the



paintings, and mentioned that he was preparing a careful copy, to be mounted upon a roller and deposited in some accessible place for reference.

### ARBROATH ABBEY.

BY the demolition of the north-west tower of Arbroath Abbey, which the stress of time and tempest seems to have rendered inevitable, this magnificent ruin will lose one of its striking architectural adornments and the ancient burgh a landmark that unites it with the ages. Immortalised in fiction and conspicuous in the realm of history, the abbey of Aberbrothock, says Mr. P. C. Carragher in the *Scotsman*, is endowed with a superb charm which clings to every vestige of its picturesque fabric, each stone and column, gloomy crypt and graven corbel contributing a chapter to the wonderful romance that legend and annal, poetic fervour and fond fancy have elaborated.

The tower of the monastery of St. Thomas à Becket, as the loftiest part of the existing ruins, thus commands an interest of its own—one which will, it is believed, survive as long as the ruins endure or a single part is left to mark the foundations of this great stone colossus. The imposing character of this remain helps us to judge of the importance of the abbey itself, over which so many historians have grown eloquent, whose praises so many poets have chanted, and around which, by its palpable reproduction in the pages of "The Antiquary," Scotland's greatest novelist has woven a magic spell.

The towers of Aberbrothock Abbey (there were several) must have been of exceptional magnificence, for they are so described in the evidence of Sir Arthur Bone, priest of Brechin, as contained within the "Vetera Monumenta," wherein the church is described as of Early English architecture and of the First-Pointed style of Gothic, and is also stated to be nearly twice the size of Sta. Maria del Popolo, which it closely resembled; this being partially accounted for by its joint dedication to "Mary the Virgin" and "St. Thomas the Martyr." The tower now crumbling into decay, which was 103 feet in height, is described in 1517 as somewhat higher than the campanile of Sta. Peter's at Rome, and as containing "many excellent bells." The standing relic disposes of any doubt as to the prominence it occupied in the abbey's design, and this great red column (for centuries a guide to the mariner on the North Sea) rises high in air like some gigantic stalk, dignifying rather than dwarfing the broken structures which are so artistically clustered at its base. Nor is this altitude in any way disproportionate to the character and extent of a building which Ochterlony assures us was "the largest for length and breadth in Scotland," which we know rivalled in size and splendour the great church of Dunfermline, the monastic houses of Chester and Lichfield, to which its redstone composite bore some resemblance, and Holyrood, which vied only with it in richness of endowment. But if, failing the magnitude of St. Thomas's Tower, proof of the extent and elegance of the abbey were wanting, it would be furnished in the still standing sanctuary and high altar, the former scene of its impressive services and high pontifical ritual, and in the also surviving lofty tribune of St. Catherine's altar, clothed from the great ellipsis ("the round O") to its base with a wealth of carving and balconied sculpture, the original beauty of which it requires no strain of the artistic imagination to conceive.

Although hundreds of years have sped, there is an impress of reality in every uninjured niche and shadowy corner of those aged walls. Stairways and porches give back the shadows of the ghostly figures which flitted hither and thither along those now silent colonnades and passages. The original sacristy, surrounded on all sides by an arcaded dressing of arches, is so entire that one almost expects to see emerging from the vaulted doorway the procession of ecclesiastics and acolytes with clasped hands, upraised croziers and swinging censers. We can to-day walk around the broad walls and look down into the gardens, still suggestive of cloistered peacefulness and the grey cassocked figures which haunted them. We can see—also in its perfect entirety—the abbot's house (the only one in Scotland), which sheltered its thirty-two mitred celebrities, beginning with that humble monk of Kelso who was elevated to its first pastoral dignity, embracing in the long succession Bernard de Linton, high priest of the Scottish forces at Bannockburn, and ending with Cardinal Beaton, the most illustrious and last of its robed prelates. Here De Linton entertained the Bruce, and the King of the Commons cracked his jokes. This was the temporary home of celebrities royal, ecclesiastical and literary. Of the last category were Alexander Myln, first president of the Court of Session, and John Barbour, father of Scottish poetry.

In all this wealth of reminiscence and royal interest, the abbey's surviving fabrics share, and it is when we come to examine the fine entrance and its ornaments that we realise how splendidly the approach to this headquarters of Church ordinance and royal convocation was dignified.

Here, standing as it did centuries ago, is the Galilee porch with its deep recesses and entrance arch—abounding in the triumphs of carving art, and the broken curve of the beautiful rose window presents a faint suggestion of that which in Durham Cathedral commands the admiration of the sightseer. If the tower of St. Thomas, upon which the unalterable fiat of the Commissioners of Woods and Forests has now fallen, is the feature of the existing ruins, how conspicuously must it add to the sombre dignity of the abbey front. Upon it the builders of the abbey seem to have lavished much skill, destined as it must have been to outlive the centuries. The inner stairway—which few of the later generations have ever had the pleasure of climbing—gave partial access to the choir, the Gothic openings of which remain to remind the visitor of those grand orisons that floated over its ornate balcony towards the high altar then wreathed in the incense of solemn mass and crowded with gorgeously-vestured priests—a place, indeed, of picturesque ceremonial, Mediæval grouping and divine song.

From the tower the clangour of fine bells awoke the distant echoes of the valley of the Brothock, at matins, vespers, sexe and none, and ringing out to ocean, reminded the mariner of that good abbot of Aberbrothock, upon whom Southey's cherished legend confers the title of a truly practical benevolence—the hanging of a bell for the warning of sailors on the classic Inchcape Rock.

The tower seems to have overshadowed in interest everything of its kind. It obviously commanded a wide prospect, and imagination can readily conjure the vision of those grey-coated Tyronensian monastics peering into the vista, and falling into ecstatic raptures as glittering spear and flashing coat of mail announced the approach of a royal retinue; for Arbroath Abbey is rich to overflowing in the memories of its kingly pageantries, from the days when its worthy founder, William the Lion, came to witness his accomplished work, down to the time when the over-zealous Queen of Scots—the last royal visitor to the abbey—laid her troubled head within its hospitable roof. At the present day, when it is fashionable to attribute to pestilence and the ravages of storm and age rather than to the destructive tendencies of individuals the decay of our ancient monuments, it looks like a contradiction in fact to find that so early as 1580 Arbroath Abbey was permitted to be used as a quarry to build the parish church. In the seventeenth century it was further seized upon by the local magistrates to build a Tolbooth, the predatory instinct of the townspeople following that earlier example in vandalism and the lead of the burgh magnates to the more audacious extent of taking stones to build their own dwelling-places, thus making a veritable quarry of a sanctuary. When Dr. Johnson came to view the ruins of the abbey in August 1773 and paid his eloquent tribute to its attractiveness, its condition was anything but favourable to suggestions of external elegance. It was still a quarry, and not until 1816 was the débris of centuries removed and the tomb of the Lion King laid bare, disclosing, as the "Liber Registorum de Aberbrothoci" puts it, a state of national irreverence and neglect.

If Royal Commissions and stately conventions, regal hospitalities and solemn grandeur make a palace, then Aberbrothock Abbey, even in this sense, can claim a nobler title than St. James's, if second only in stirring incident and high emprise to old Holyrood. Surely then one must regret the loss of one single stone, one clustered pillar or jagged architrave, for each is precious with the preciousness of a hallowed antiquity.

But the passing of the tower of St. Thomas proclaims the effacing power which cannot be arrested.

We should desire to remember it, not merely as a great stone idol, but as a mark of much that is interesting in Scottish history, a large part of the luminous panorama of which must have unrolled itself under the shadow of this silent sentinel of time.

### MANCHESTER SOCIETY OF ARCHITECTS.

THE annual dinner of the Manchester Society of Architects was held at the Queen's Hotel, on Friday evening. The president, Mr. Alfred Darbyshire, occupied the chair, and amongst others present were the vice-president of the Royal Institute of British Architects, Mr. John Slater; Sir James Hoy, Mr. Edward Salomons, Mr. John Woolfall (president of the Liverpool Architectural Society), Mr. W. A. Royle, Mr. F. H. Oldham, Mr. John Ely, Mr. J. B. Gass and Mr. J. W. Beaumont. The president of the Royal Institute of British Architects (Mr. Aston Webb), the president of the Architectural Association (Mr. Henry T. Hare), and the Principal of the Owens College were unable to be present.

The Chairman proposed the toast of the Royal Institute of British Architects.

Mr. John Slater replied. He said that while in recent years not so much had been heard of the vexed question of the compulsory registration of architects, many members of the



profession, especially in the provinces, thought that a compulsory registration would be found a panacea for most of the evils from which architects and architecture were suffering. If registration were to come and be a success, it could only be through the ranks of the Royal Institute. He was not altogether without hope that in the not far distant future some practical means of bringing that about would be found. With regard to the work and influence of the Institute, both had increased during the last year or two, and no one who had not sat at the Council of the Institute for some years could have the least idea of the enormous number of professional questions referred to that body. They had been consulted more than once lately by the Government and by public bodies with reference to matters of great public interest, and he was glad that that sort of spirit appeared to be gaining ground. The more municipalities and those who had to do with the architecture of buildings sought the advice of the local societies, the better it would be both for architecture and for the public. Architecture was a profession—or a business, if one preferred to call it so—but it was also one of the fine arts. Indeed, it was the mother of all the arts, because painting and sculpture, and what not, had only achieved their greatest successes when they enhanced the most brilliant pieces of architecture. Treating architecture as an art, no one could possibly exaggerate the influence on the younger generation when they were brought into contact with art and artistic matters at an early stage. Manchester had some most admirable Board schools, well built and well equipped in every way, but with regard to their interiors, the classrooms were not quite as beautiful as they might be, and it would be a good thing if the students at the Art school were encouraged to do something towards the beautification of the Board schools. This would be splendid practice for the art students, and the educational effect on the children of the Board schools would be really great.

Mr. Edward Salomons gave the toast "The Victoria University and the Owens College," to which Mr. Alfred Hopkinson was to have responded. But Mr. Salomons read a letter from Mr. Hopkinson explaining that, in consequence of the death of his friend and colleague, Professor Withers, he could not take the part in the proceedings that had been assigned to him. Mr. Salomons said that it had been expected that Mr. Hopkinson would have made some announcement in regard to the proposed appointment of a professor of architecture at Owens College. There had been a wish on the part of the College, and this had been cordially met by the Society, to appoint such a professor, and after many meetings of the committee appointed by the College and the Society and the School of Technology, the scheme had at last been accomplished, and it had been agreed that a professor should be appointed to fill a chair at the Owens College and to be the teacher of architecture at the School of Technology. The appointment had not yet been made, but certain steps had already been taken towards making it.

Mr. J. W. Beaumont proposed "Technical education," and Sir James Hoy responded. Speaking of the prospective arrangement for filling a chair of architecture at Owens College, he said it was intended that this should be a joint professorship. The professor was to be partly paid by the College and partly by the School of Technology. The initiatory steps were progressing satisfactorily, and there was good reason to suppose that within the next twelve months such arrangements would be made as would place what one hoped would then be the University of Manchester in the same position in regard to the profession of architecture as was at present occupied by the University College of Liverpool.

Colonel Eaton proposed "Allied societies," and Mr. John Woolfall, of Liverpool, responded. Mr. William Goldthorpe gave "The Manchester Society of Architects," and the President replied. Other toasts followed.

#### ULSTER SOCIETY OF ARCHITECTS.

THE annual meeting of the members of this Society was held on the 10th inst. in Ye Olde Castle, Castle Place, under the chairmanship of the president, Sir Thomas Drew, R.H.A. (Dublin). The attendance included Messrs. W. J. Gilliland (vice-president), W. J. Fennell, F. H. Tulloch, Henry Seaver, J. J. Mc'Donnell, J.P.; J. A. Hanna, W. B. Fennell, W. B. Blackwood, T. Houston, T. Roe, J. St. J. Phillips, W. H. Patterson, C. D. Patterson, A. B. Dobson, H. J. Goskar, A. A. Blount, E. R. Kennedy, Vincent Craig, J. C. Lepper and N. Fitzsimons (hon. secretary).

The honorary secretary read the annual report, which contained the following:—When the last annual report (which was also the first) was presented, your Council was engaged in a struggle with the Belfast Corporation to obtain the suitable modification or withdrawal of the objectionable clauses in reference to the elevations of buildings contained in the Bill

then being promoted in Parliament. Deputations from the Society waited on the law and improvement committees, and also attended meetings of the Council for this purpose, but without avail. A petition to Parliament was agreed upon and duly presented, resulting in the rejection of the clauses, and thus a serious infringement on the rights of private property and certain disaster to architectural design in Belfast were happily averted by the action of the Society. The interests of the architectural student and the welfare of art instruction generally have been watched over by your representatives on the consultative committee of the Municipal Technical Institute as far as the limited scope of the powers delegated by the technical instruction committee permits. The claims of Belfast to improved facilities for architectural education were laid before the Irish University Commission by your vice-president in evidence approved of by your Council. It is to be hoped that sooner or later such improved facilities may be provided. A design and sketching club has been established under the supervision of your Council, but managed by a secretary and committee appointed by the members themselves. In co-operation with the Belfast Chamber of Commerce, the question of the reissue of the Ordnance maps of Belfast on a reduced scale in substitution for the present 5-foot scale is still under consideration with the object of having the reissue on the present useful scale. There has been a substantial increase to the membership during the year, the present total being fifty-seven, while several important nominations have been sent in and await election, which will further increase the numbers and add considerably to the strength of the Society.

The report was adopted, on the motion of Mr. H. Seaver, seconded by Mr. V. Craig.

The following office-bearers were elected for the ensuing year:—President, Sir Thomas Drew; vice-president, Mr. W. J. Gilliland; honorary secretary, Mr. N. Fitzsimons; honorary assistant secretary, Mr. W. B. Fennell; honorary treasurer, Mr. H. Seaver; members of Council, Messrs W. J. Fennell, F. H. Tulloch and J. J. Mc'Donnell, J.P.; associate members of Council, Messrs. T. Houston and W. C. Maxwell; honorary auditors, Messrs. J. St. J. Phillips and Vincent Craig.

The meeting afterwards terminated.

#### REMINISCENCES OF RUSKIN.

ON Friday last there was a meeting of the Ruskin Union, held at the Egyptian Hall, Piccadilly, when Mr. Oscar Browning delivered a lecture on "Personal Reminiscences of Ruskin." The chair was occupied by Sir Henry Howorth.

Mr. Browning said the first time he ever heard of the name of Ruskin was on the publication of the first volume of "Modern Painters," in 1856, when he was still a boy at Eton. The first time he saw him was on October 29, 1858, when he delivered his address to inaugurate the Cambridge School of Art, and he could well remember his appearance then—young, slim, and in no way remarkable. It was many years after this that he became personally acquainted with Ruskin. He (the lecturer) was then a master at Eton, and had founded an institution which was called the Literary and Scientific Society. At his special request Ruskin agreed to deliver two lectures before the members of this Society, and he now produced the original copies of the letters addressed to him by Ruskin on that occasion. He had the honour of entertaining him and getting speech with him on that occasion, and he struck him as the embodiment of culture. His dress, his manner, his voice and everything he said seemed to exude a spirit of calmness, and peace, and courtesy, made more noticeable by the rough and tumble disorder of a schoolmaster's life. His (the lecturer's) mother and sisters lived with him, and kept his house, and Ruskin's courtesy to them was absolutely perfect. He seemed to set before them all the higher ideals, both of life and conduct. He had many conversations with him, but he only remembered one thing specially. There hung at the end of his drawing-room three pictures—in the centre Titian's *Flora*, and on each side Raphael's *Madonna Della Sedia* and the *Coronation of the Virgin* by Botticelli, the picture now called the *Magnificat*. When Frank Cornish, the present Vice-Provost of Eton, and himself had gone to Florence as boys in the year 1861 they had been captivated by this picture, then very little regarded, and he had ordered an exact facsimile of the head of the angel holding the crown—a head quite erroneously said to be a portrait of Lorenzo de Medici. It was therefore natural that, standing before this picture with Ruskin, he should say to him, "When I first went to Florence I immediately pitched upon this picture as the best in the galleries." He replied, "I know now that it is, but it took me ten years to find it out." He ought to have replied, "You have not read your own books," but this *esprit* which reminded them of *bons mots* which they had neglected, was only too common. The two lectures were on "The



Swallow" and "The Chough." He did not remember much about them, except that the room they were given in, that beautiful boys' library which is now destroyed, was crowded, and that the boys were delighted. Ruskin stayed on that occasion at Botham's Hotel, Salt Hill, which had now been pulled down. In the summer of 1874 he visited Ruskin in his rooms at Oxford, and he could remember a most delightful conversation, and a lovely portrait of Raphael which hung over the mantelpiece, and which he told him was painted by a fellow-pupil in the studio of Perugino.

Another lecture was delivered by Sir William B. Richmond, R.A., entitled "Recollections of Ruskin" at St. Peter Mancroft Parochial Hall, Norwich. Archdeacon Pelham presided.

In the course of a most interesting paper, says the *Norwich Mercury*, Sir William Richmond said it was longer ago than he could remember that he first saw John Ruskin. The influence of such a masterful as well as engaging personality as Ruskin's was, so magnetic and stimulating, acting upon the sensitive minds of children whose environments as well as antecedents were cultivated, predestined them to receive an indelible stamp from such a seal. Whether as men and women they now agreed with all that Ruskin taught was neither here nor there: this was certain, the best and truest of it all stuck fast, and helped them all to desire to promote beauty, and furnished them with a desire to emulate his enthusiasm, not only keeping it for themselves but, when chance offered, giving it to others. It was indeed a privilege to have had such an intellectual as well as passionate example grafted on early years, to have had it as the very air they breathed and the bread they ate. Ruskin was *facile princeps* as a writer on art, and the most enlightening that literature had produced. They might or might not agree with the light that he shed, but light it was—clear and brilliant, piercing a darkness which had fallen over the minds of Englishmen, convincing them against their will that beauty mattered, and that science, comfort, fashion and worldliness were not or ought not to be sufficient to provide for the wants of a great nation—an example which they would do well to follow, disregarding the gibes of Philistines. Who could deny that every strain of thought, every motive power, however wild, every paradox, however irrational, from Ruskin's pen had as its genitor real enthusiasm? a quality much needed in an age that did not like to "give itself away." His was the very antithesis of the cold northern temperament. His words, said the lecturer, sped like the fire that ran along the ground. They would have destroyed the worshippers of Baal. Some they have destroyed, but a large fraction yet remains, though it is dwindling under the fierce light of truth and a higher motive of altruism. A reaction set in against his teaching not long ago, and rightly, in a measure, because it strengthened what is best and lasting of it and brushed off the cobwebs which had grown up about it. The position of Ruskin is now assured. The fallacies of his teaching are exploded, and the great master stands out for ever as a shining light of his century. When I was a boy, Mr. Ruskin used to come to my father's house to what we called "high tea." In his habit of enforcing speech with gesture he was unlike an Anglo-Saxon—the Celtic blood exerted itself. He had a habit of sitting very low down in his chair—indeed, reclining in it—with his head delved in the recesses of his chest, and while conversation was continuing his periods of silence alternated with rapid utterances pronounced with enormous picturesqueness and eloquence, not argumentary, for he was not a good listener, but dictatorial. Argument and logic were not prominent forces of his mind—imaginative statement was his pronounced identity. The first impression created by his conversation was that he was immensely opinionated. This is true, but he had a right to his opinions because even in the earliest days of his career he had thought a great deal more than most people, and was possessed of a power of stating his conceptions entirely his own, and exercised, if paradoxically sometimes, with eminent sincerity. Ruskin prided himself upon his critical powers, *i.e.* destructive criticism. He resolved, as a child does, to make the doll of the moment into a god. That idol he constructed at the expense of every forerunner who was not in accord with the dream he was making into a reality. Ruskin had real modesty, for no one was more critical of himself than he. His most bitter critics have never exposed his thoughts more trenchantly than he did, but he, unlike many of them, did so with a style so convincing that his criticism of his own mistakes in judgment added strength to his inspiring power. The influence of Turner's minuteness of observation stimulated Ruskin's, whose drawings have not had justice done to them. Their merit has been too much eclipsed by his drawing and painting in words. The Ruskin Union would do well to organise an exhibition of the master's drawings. I know that there was an exhibition of some of them awhile ago, but a complete collection brought together and placed before the public by this Union would, I think, prove a very valuable addition to the services of the Union in promoting the knowledge of the many-sided genius of the

master. I doubt if any artist has ever drawn architecture with more feeling, or made it of rarer artistic interest than Ruskin. He had a most refined sense of form, and as a colourist he was no less remarkable, but it is strange that the inventive faculty which was so strongly marked in his writings does not appear in his drawings at all. He once said to me, "I have no power of design. I can only draw what I see." Dealing with words, he not only described, but he created. "The Queen of the Air" is, to my thinking, one of the most delightful poetic treatises upon Greek myth as connected with cloud and storm ever penned. No one else could have touched the subject with so delicate a hand. In this little book Ruskin has set forth his pantheism and displayed his consummate understanding of that side of the Greek temperament which was in allegiance with mountains, clouds and streams. The pen with which he wrote it diffuses the many tints of Iris's bow into far-reaching words, turning sensitive visions into realities and burning thoughts into visible flames. This, then, is Ruskin's supreme gift: to give eyes to the blind and to those that can see extension of vision, to take us with him, and translate us into regions invisible till our eyes are opened, and, with minds replenished, we mount with him into the chariot of fire and ascend, leaving the cloak of inspiration upon the shoulder of another prophet, saying, "Go and do likewise." The quality of his imagination, high as it was, undoubtedly came more readily into touch with the inanimate than with the animate. As with Shelley, the weakest part of Ruskin's work is where it deals with human emotion as depicted in art. The great emotions, tribulations and tragedies of life disturbed him. He was ill at ease among them; they had no place for him in art, however much they might occupy the political economies of another side of his mind. He could understand the inanimate emotions of clouds; the tumble of the sea was too much for him. His emotion was awakened and his inspiration was enlivened by his acute sensibility to the earlier orders of creations. His pantheism, while it was strong, did not exclude the tragedy of life. This limitation was his strength, as well as a cause of weakness. The cause of it was reaction. The ideal, or what has been falsely called the historic school of painting, was represented to him by the bathos of imitations of the grand style, so often insisted upon by Reynolds in his "Discourses." A keen sensibility to beauty and to the activity of nature's design, rendered anything akin to precedent a place only among insincere motives. This insincerity, which to him was fatal, roused vehement indignation in a soul that revered all created things. Rather than attempt to sound the depths of the pathetic act of Michel Angelo, he took his cue from imitators who failed to do what their master had done, but instead of scolding them Ruskin scolded their master. His real love was Turner, also in a sense from the literary point of view, because he could interpret his art in language. His prose was inspired by a theme which had an almost endless gamut whose each note was contained in the scale of nature, each one vibrating back into his own love, his own observation, which touched the chord of solitariness in a temperament that loved the floating clouds, moss grown rocks and green pastures, more than it could enter into the deeper passions which are inseparable from human life. In its relation to art, Ruskin's mind was like a microscope. It was Aristotelian, not in the least Platonic. It worked from the material to the ideal; from the small to the great, not from the great to the small. But in his ethical and political writings the ideal is predominant. He was a man of many moods. For a time the broader handling of David Cox succeeded his delight in the minute refinement of Turner; and he was then picking holes in some of his own views. This change in opinion did not surprise me much because, with that intuitive justice and sense of the illogical in the young mind, I had detected his tendency to paradox. His power of enlisting and sustaining enthusiasm was phenomenal. As a lecturer his power was transcendent. Yet the most characteristic parts of his discourse were those when he left his text, and rambling away from the subject immediately in hand conversed enigmatically about art as a cosmic function in life—when he drew spontaneous and prophetic word-pictures of passing themes, made game of the self-made man, of society, of vulgarity, of the Philistine, and weaved ethics with æsthetics, so charmingly, in sentences complete in style and bristling with illustrations. His kindness and consideration for all his domestics and dependents was extended to all classes with whom he came in contact. There was not the least vein of snobbishness in his nature. His love of music was sincere, but very limited. It is strange that with his unique appreciation of the rhythm of prose and verse, that he cared for the tritest melodies, and sentimental songs, if accompanied by words congenial to him, he pronounced to be masterpieces. Here again is an illustration of the absence of the epic quality. Beethoven's music said little to him, nor do I think that Handel moved him much, but Moore's melodies, beautiful certainly, but in a small way, and such songs as "John Anderson, my Jo, John," and



Scotch ballads immediately appealed to his sensibilities. His immense admiration for Scott's poetry is puzzling. Greatly as he admired Scott's prose, I think his inclination was to prefer his poetry. It is impossible to gauge the stimulus that Ruskin gave to the pre-Raphaelite movement. When that was initiated by the little band of workers who determined to see nature as she is and to interpret her with strict veracity, the art of painting had become stereotyped by convention and hide-bound by precedent. To the Philistine the efforts of Hunt, Millais and Rossetti were inspired by affectation; the truth and innate sincerity, the very foundation of those efforts, were regarded as an expansion of strangeness and ugliness. When Morris said "Ruskin has made art possible in this country," he spoke the truth. His burning words and powerful analysis have set art upon an intellectual pinnacle in the eyes of the educated public that it has not occupied since the great days of the Renaissance. It is through Ruskin, he being the primal cause of it, that the minor arts are now taking a place in our life. It is he who has set us thinking that beauty should weave through life as the threads of a great tapestry. Morris took up those threads, and by his indomitable energy and practical skill added to Ruskin's theoretical teaching by expanding it as well as by putting it into practice. In the broad sense, Morris was Ruskin's pupil; he carried to an extreme whatever elements exist in Ruskin's teaching that tend towards undeveloped socialism. The output of Morris's social policy was generated by Ruskin's ethics.

In responding to a vote of thanks, Sir William Richmond said what they had to do now was to try to follow out the main principles of a life which taught, not only in words, but in its living, the great art of the beauty of life. That was the main feature of Ruskin's teaching. He told us not only to look at beautiful things, but to try to maintain them. There was such a thing given to them as pure air and the rays of the sun. London became almost uninhabitable, mainly because of the ghastly selfishness of manufacturers, who were absolutely determined to defy the Act of Parliament. Now, these men he (Sir William) regarded as sinners in the worst sense. In order, as they thought, to add a small percentage to their year's income they were preventing in the neighbourhood the growth of beautiful flowers, plants, shrubs and fruit, which ought to be the possible possession of every leaseholder and of everyone who desired to enjoy the fruits of the earth. One reason of the great deterioration of the beautiful buildings of large towns was the acid and carbon which was deposited on the surface of the stone, and which served to disintegrate it and caused it to scale off. Even in those parts of the cathedral which had recently been restored this was happening in Norwich to-day. He held that all town and borough councils which did not put in force the Act of Parliament which gave them powers to abate this nuisance were extremely remiss, and he might add that the initial expense entailed in preventing the waste of fuel was slight in comparison to the after benefit to the manufacturer himself.

#### EXPLORATION OF THE TIBER.

FROM time to time projects are announced for seeking treasures in the bed of the Tiber. A correspondent of the *Springfield Republican* gives the following account of one which now is receiving attention:—

Professor Ciro Nispi-Landi, the author of the latest scheme for exploring the bed of the river Tiber, is no mere "dreamer." A man of profound learning, he now holds the responsible position of inspector of national monuments to the Italian Government, and is the author of several thoughtful works on ancient Rome. It was the Professor's historical studies and researches that inspired him with his great idea of searching the Tiber for treasures. They directed his attention first to the length of time during which Romans, rich and poor alike, cast into the slow-flowing river their most cherished possessions, and also to the period, unexampled in history, of thirty-four centuries in which the Tiber was the centre of momentous events. Professor Nispi-Landi's notions were strengthened by what he saw while in charge, several years ago, of the work of building the Tiber's embankment. The Professor noticed, as he tells me, that "whenever and wherever the Tiber was searched in the course of bridge-building or of the work on the embankment, ancient and valuable things always came to light." Generally they were valuable enough to pay the entire cost of the operations. For instance, one Italian bridge-building firm, in laying the two pillars of the Ponte Palatino, discovered antiquities to the value of several million lire. In adjusting the foundation-pillar of the Ponte Garibaldi three beautiful antique bronze statues, one of Bacchus and one of Venus, came to light, and in widening the Ponte Cestio antique jewellery, one piece of which was a wonderful gold collar of turquoise, and other valuable relics were drawn up from the depths, where they had lain for years. In the course of the complete work on the embankment enough ancient works of art and other relics were

discovered to stock one of the richest museums in Rome—that of the Baths of Diocletian.

"Most of the treasures," remarked the Professor, in response to one of my questions, "are certainly to be found in the most central part of the river, and have remained undiscovered for that very reason." He consented to give a hint of his plans. He has, for this purpose, divided the Tiber into "zones" or districts. They are eleven in number, No. 1 covering most of the Tiber in Rome proper, the others the course of the river outside the Eternal City. "We shall proceed," said the Professor, "by digging parallel trenches for the first zone, where the ancient source of the river is dried up, with the aid of steam pumps, and where the Tiberine waters follow their natural course with pneumatic tanks modified and adapted to the special use of river exploration." The enterprise will be financed by Chevalier William Millar, a wealthy Anglo-Italian of Leghorn, who has implicit confidence in the savant's scheme. Just when the actual work will be begun is not yet decided. The permission of the State was given to the enterprise some time ago, but recently some "recommendations" have been made by the Museum of Antiquities. Compliance with them has delayed matters, and it may be some time before the delving begins in earnest.

Search in the Tiber always has been richly rewarded. The Professor goes back as far as the thirteenth century, quoting one of its historians, Falminio Vacca, who described how a small boat having sunk near the Ponte Sublicio and several swimmers being engaged to fish it out, arrows, swords, breast-plates, arms of every description "and other beautiful objects," recognised as purely Etruscan, were discovered and brought to the surface. But, after all, it is necessary only to review one's Roman history a little to convince anyone that there should be riches in the Tiber. That they were put in is certain, and Professor Nispi-Landi states that in all his research he has been unable to find any record of any large quantities of them having been taken out. The records of sacrifices to the Tibertine deity go back to the beginnings of Roman history. Even Virgil tells how Æneas promised Father Tiber that if he would protect him from peril, "Thou shalt ever be worshipped by me with homage and with gifts." The example of Æneas was followed by the generations that came after him. Sacrifices were made on the eve of great events, such as battles, during times of national peril, to make sure of having the god on the suppliant's side, during great rejoicings, and to commemorate illustrious men who had died. These were the great public sacrifices, of course, but private individuals in prosperity and grief offered personally similar sacrifices, generally the most precious things they owned. Back in the time of the Arcadians men used to be hurled into the Tiber, but soon they were replaced by puppets and graven images, and after this the offerings of money, jewellery and precious things began.

It was not only the Romans who sacrificed to Father Tiber. The superstitions of all the Southern races seem to have been pretty much alike at this time, and whatever force was near the river made votive offerings to it. The Huns, the Goths and the Vandals all hurled a large part of the plunder derived from their sacks of Rome into the ancient stream. "Such offerings were," says Professor Nispi-Landi, "the cause which contributed chiefly and for the longest period to enrich the bed of the Tiber with precious relics." Another cause, however, was the casting into the stream by the Romans of their possessions in order to prevent their being captured by enemies. For instance, after the defeat of Maxentius Saxa by Constantine, say the records, "not only a great number of dead and wounded men and an immense quantity of arms and valuable objects, but even the treasures of Maxentius and the military chest of his army were thrown into the river to prevent their falling into the hands of the victorious foe." To save them from the Huns, and later on from the French, marbles, bronzes, statues, busts and costly images enriched the Tiber. Add to all this treasure the hundreds of rich pagan statues and temple ornaments thrown into the river by the Christians, and the property of all who conspired to bring about the assassination of Cæsar, which had a similar fate, and an idea will begin to form of the vast treasures on the Tiber's bottom.

This Italian scholar, whose works "Rome before Humanity" and "M. Agrippa and his Temple," are, by the way, well known in Italy, has not by any means contented himself with the conviction that treasures in the aggregate are below Tiber waters. He has drawn up for himself a list of individual relics of which history speaks, and has attempted to locate each in one of his "zones," according to the details which he has been able to gather as to its sacrifice. For instance, the Professor believes that the sacred candlestick of Moses, the object that he would like best of all to recover, will be found in its first zone, or in that part of the Tiber near the famous Castel Angelo, close to the Vatican and St. Peter's, probably that part of the river that most Americans have seen.

Says the Professor:—"It is certain that religious objects were left untouched by the superstitious Alaric and Genseric; indeed, in 509 and 529 the candlestick was still to be seen in



Rome. I regard it as certain that the emblem ordered on Mount Sinai, which stood in the Tabernacle of King David, which was carried round the walls of Jericho and was venerated by Cæsar and Pompey, was eventually lowered by the Jews down from the bow of Æsculapius's ship on Tibertine Island in our first zone. The Jews themselves always have asserted that it is there. Consider that more than 1,900 years have passed since then, and that the candlestick was then about 1,550 years old, making a total of 3,448 years. What importance would its discovery have? Who should have the greatest claim to its possession? How much should be paid to the discoverers? It is not easy to answer these questions. Everything should be as wonderful as the candlestick itself."

Professor Nispi-Landi will be one of the most disappointed men in the world if he does not bring up from the Tiber's bed thousands of suits of rich armour, of swords and shields, the property of the wounded men who through custom were hurled into the river and those that fell in the fearful battles on the bridges. Among these he expects will be the armour of brave old Horatius Coclès and his men, who kept the Pons Sublicius against the Etruscan army, and finally leaped into the Tiber. "There must be," he writes, "in that part of the river arms, coins, ornaments, jewels, such as buckles, collars and rings, all rare and valuable as the only relics of the Romans and Etruscans of those days." He expects to find the famous Minerva statue of Phidias, as well as those of Hercules, Mars and Venus, with the pearl of Cleopatra. He believes he will bring to light the solid gold statue of Claudius II., which once stood in the Capitol, and which was thrown into the Tiber to save it from the Goths.

Probably one of the first questions that will come into the mind of anyone who reads this story of Professor Nispi-Landi's great project will be:—If the Tiber is so rich in treasures, why has no one tried to get them before, or at least why has no one thought of doing so? Well, for hundreds of years men of an ingenious turn of mind have been pondering upon doing and attempting to do that precise thing. For his scheme of searching the Tiber's bed, Professor Nispi-Landi claims no originality; he claims only to be the first man who has yet set doing it with the proper mechanical devices. The list of those who in modern times have attempted to make the Tiber disgorge is headed by the name of the learned Cardinal de Polignac, who planned to deviate the Tiber from its course for about two miles, and then to dig for the antiquities which he believed were discoverable. Pope Benedict XIV. smiled on the cardinal's project, but while the necessary capital was being gathered the Pope died, and his successor was dissuaded from aiding De Polignac, on the ground that the climate of Rome might be injured.

In 1773 Don Alfonso Bruzzi undertook the exploration of the Tiber by means of a cofferdam of his own invention. The device did not come up to expectation, for the water rose and overturned it. Yet, for the short time it worked, enough was found to pay all costs and leave a profit. The scheme of Joseph Naro, in 1815, was not so successful. He, too, believed the Tiber to contain treasure, but he tried to get it by means of a kind of mudscraper, a "grattina," as he called it, which, whenever an incumbrance was met, was planned to strap it and draw it up. Only fragments of statues, marble blocks and funeral columns were, however, brought up by the "grattina." Garibaldi dreamed of searching the Tiber, but he, too, wished to deviate the course of the river, and this the Italian Parliament refused to allow. The most recent man of celebrity to consider exploring the Tiber was the late Prince Alexander Torlonia. He, however, wanted to keep so much of what he found that the Government refused to grant him permission to make a trial. The Prince had felt so certain of success that he offered to deposit as a guaranty for the work the sum of a million and a half of lire, 300,000*l*.

Professor Nispi-Landi believes that he at last will succeed. He says:—"I have now fulfilled all the formalities required by the Minister of Public Works, and the ministerial decree will enable us, with new means and a positive and practical prospectus, to see the great river searched at last, and the abundant riches of intrinsic and artistic value of every ancient epoch triumphantly recovered. Let only fortune smile on our enterprise and merit and riches are ours."

## TESSERÆ.

### Athenian and Roman Theatres.

IN Athens the drama was, as it were, an act of worship—it formed an integral part of a joyous yet serious religious festival. The theatre was a temple, the altar of a deity was its central point, and a band of choristers moved in solemn march and song in honour of the god and, in the didactic spirit which sanctified their office, taught men lessons of virtue. Not that the audience entered the precincts with their hearts imbued with holy feelings or with the thoughts of worshippers; but

this is always the case when religious ceremonials become sensuous. The real object of the worship is by the majority forgotten. But still the Greeks were habituated, unconsciously, to be affected by the drama, as by a development of religious sentiment. With the Romans, the theatre was merely a place of secular amusement. The thymele or altar of Dionysus existed no longer as a memorial of the sacrifice to the god. The orchestra, formerly consecrated to the chorus, was to them nothing more than stalls occupied by the dignitaries of the state. Dramas were certainly exhibited at the great Megalensian games, but they were only accessories to the religious character of the festival. A holy season implies rest and relaxation—a holiday in the popular sense of the word—and theatrical representations were considered a fit and proper species of pastime; but as religion itself did not exercise the same influence over the popular mind of the Romans which it did over that of the Greeks, so neither with the Romans did the drama stand in the place of the handmaid of religion. The style in which the Roman theatres were built indicates that whatever taste for tragedy the Roman people possessed had now decayed. The huge edifice erected by Pompey was too vast for the exhibition of tragedy. The 40,000 spectators which it contained could scarcely hear the actor, still less could they see the expression of human passions and emotions. The two theatres, placed on pivots back to back, so that they could be wheeled round and form one vast amphitheatre, show how an interest in the drama was shared with the passion for spectacle, and provision was thus publicly made for gratifying that corrupt taste which had arrived at its zenith in the time of Horace, and interrupted even comedy so early as the times of Terence.

### Louis Jacques Maude Daguerre.

Daguerre was favourably known to the world before the announcement of his discovery of the daguerrotype. His attempts to improve panoramic painting and the production of dioramic effects were crowned with the most eminent success. The following pictures attracted much attention at the time of their exhibition:—"The Midnight Mass," "Landslip in the Valley of Goldau," "The Temple of Solomon" and "The Cathedral of Sainte Marie de Montreal." In these the alternate effects of night and day, of storm and sunshine, were beautifully produced. To these effects of light were added others arising from the decomposition of form, by means of which—for example, in "The Midnight Mass"—figures appeared where the spectators had just beheld seats, altars, &c.; or, again, as in "The Valley of Goldau," in which rocks tumbling from the mountains replaced the prospect of a smiling valley. The methods adopted in these pictures were published at the same time with the process of the daguerrotype by order of the French Government, who awarded an annual pension of 10,000 francs to Daguerre and M. Niepce, jun., whose father had contributed towards the discovery of the daguerrotype. Originally a scene-painter, Daguerre became desirous of executing his works so as to produce the greatest possible illusion. To his exertions for this purpose the beautiful pictures exhibited for a succession of years at the Diorama, Regent's Park, owed their origin. In these great works he was associated with M. Bouton. The view of Holyrood Chapel, which was exhibited at the commencement of the Diorama, astonished everyone with its complete illusion. Although this exhibition did not combine all the advantages of the panorama, yet it produced a far greater degree of optical illusion. The peculiar and almost magical effect of M. Daguerre's invention arose from the contrivance employed in exhibiting the painting, which is viewed through a large aperture or proscenium. The spectator was kept in comparative darkness, while the picture received a concentrated light from a ground-glass roof. The transitions from ordinary daylight to sunshine or to darkness were produced by shutters attached to the glazed ceiling. Besides which some parts of the paintings were transparent, admitting of being lighted from behind. The combination of transparent, semi-transparent and opaque colouring, still further assisted by the power of varying both the effects and the degree of light and shade, rendered the Diorama the most perfect scenic representation of nature, and adapted it peculiarly for moonlight subjects, or for showing such accidents in landscape as sudden gleams of sunshine or lightning. It was also unrivalled for showing architecture, particularly interiors, as powerful relief could be obtained without that exaggeration in the shadows which is almost inevitable in every other mode of painting. But the scientific acquirements and active mind of M. Daguerre bequeathed a greater benefit to mankind than the Diorama in the wonderful discovery of a mode of obtaining portraits and views by the action of sunlight upon prepared metal plates so well known as the daguerrotype. The idea, however, was not original with Daguerre and his co-partner, M. Niepce, for in 1802 Wedgwood, assisted by Sir Humphry Davy, had obtained sun-impressed images upon glass prepared with nitrate of silver, but not being able to fix them, or prevent the continued effect



of the sun upon them, the process was abandoned for a time. In 1827 M. Niepce produced some specimens of pictures upon glass, copper-plated with silver, and highly-polished tin, after which he soon entered into partnership with M. Daguerre. The latter, after repeated and, it would seem, fruitless attempts to prepare a sensitive paper, entered upon those experiments which ended in the discovery of the beautiful process on silver plates which bears his name. In the interval Mr. Henry Fox Talbot made known the results of his inquiries into the action of light upon salts of silver in a paper read before the Royal Society in January 1839. This invention is called, in compliment to him, the *Talbotype*. So important was the discovery of Daguerre deemed by the French Government that, in consideration of it being thrown open to the world, they granted annuities for life to Messrs. Niepce and Daguerre, but owing to some ingenious legal construction England was considered out of the world, M. Daguerre's process patented and locked up in this country. It does not appear that M. Daguerre made further advances in his astonishing discovery, for most of the improvements have originated with other practitioners.

#### Domesday Book.

Domesday is a wonder—almost a miracle. One can hardly look at it without feeling some share of that mysterious awe with which its author was looked on by his own contemporaries. It is the Conquest, or rather it is the Conqueror himself, set before us in black and white. The idea of producing such a living picture of his whole kingdom was truly worthy of the mighty genius of William the Great. The conception is one under the circumstances at least equal to the conception of Justinian. The conception of Justinian was simply to carry out in greater perfection the conceptions of those who had gone before him. Generations of able lawyers had been for ages collecting the raw material, and the example of putting their labours into something like shape had been set by the Theodosian code. But the conception of William, if less grand, permanent and scientific than that of Justinian, was distinctly more original. We know of nothing earlier than itself, in England or out of England, which could have suggested the idea of Domesday Book. The work had never been done before, and in the ages that have passed it has never been done so thoroughly again. We know also the very natural horror and prejudice which were awakened by the searching inquiries needed for its composition. "It is a shame to tell what he thought it no shame to do," says the contemporary chronicler in his graphic description of the work. No doubt this dislike partly arose from the feeling that a foreign conqueror was in fact drawing up the record of his conquest; that one grand result of the inquiry would be to set forth in an imperishable shape how vast a portion of the soil of England had passed into the hands of the foreign king and his foreign followers. But this was not all. We may be sure that in those days an inquiry of this sort would have been enough to ruin the popularity of the most popular of native kings. Probably only a conqueror would ever have thought of it; probably only the Conqueror could have carried it out. But William did carry it out, and he is worthy of all admiration for so doing. The execution is on the whole worthy of the conception. The difficulties in the way of carrying out such a work must have been enormous. It must have needed the co-operation of men of both nations. William's immediate agents would doubtless be mainly Normans, but they must have employed or examined countless Englishmen, and besides the probable mutual feelings of national dislike, they had to get over the difficulties of their own no doubt very imperfect knowledge of the laws, customs and tongue of Englishmen. That they made the same sort of havoc of English names which Frenchmen do to this day is in no way wonderful. Perhaps the wonder is that the havoc was not greater than it is. The names of places are on the whole fairly represented; no doubt special care was taken on that point. It is before the names of English men and women that they seem to have fairly broken down. Almost every Old-English name is spelled in as many ways as Shakespeare's name was spelled in his own time.

#### GENERAL.

The Emperor of Austria will present to the Pope, on the occasion of the Pontifical jubilee, a gold statuette representing the Good Shepherd. The statuette is the work of the Viennese sculptor M. Rudolph Marshall, who has also executed a large medallion portrait of the Pope in gold, intended as a jubilee gift to his Holiness from the city of Vienna.

The Blackmore Memorial Committee have adopted a design for the memorial which is to be erected in Exeter Cathedral to the author of "Lorna Doone."

Mr. John Faed, R.S.A., the painter, left property valued at 10,418*l*. Mr. C. H. Beloe, civil engineer, of Liverpool, has left estate worth 62,709*l*.

The Corporation of Lowestoft have spent nearly 58,000*l*. during the last six years in defences against the encroachment of the North Sea. The amount expended is about one-half the rateable value of the town.

The Blockhouses in the Transvaal and Orange River colonies having been taken over by Lord Milner for a lump sum of 50,000*l*, are on sale to the inhabitants of the districts at prices varying according to size.

A Tablet is to be placed in the Zoological Gardens in memory of the late Mr. J. Nettleship, the animal painter, and another in the parish church of his native town, Kettering.

The City Churches Preservation Society have protested against the demolition of All Hallows, Lombard Street. It was resolved to obtain opinions from the various antiquarian societies upon the suggested sale, and to use every effort to preserve the church.

The Court of Common Council have agreed to co-operate with the London County Council in endeavouring to obtain the appointment of a select committee of Parliament to hold an inquiry into the breaking up of streets in London by various companies.

Mr. R. Singer Hyde, architect and surveyor, of Eriswell Road, Worthing, has taken his son, Mr. R. W. Wentworth Hyde, into partnership with him, and the firm is now known as Messrs. Singer Hyde & Son.

Sir Samuel Scott, having purchased the Old Manor, Westbury, Bucks, from Lord Barrington, has demolished the building in order to erect on its site a new residence, costing about 40,000*l*.

The Woolwich Borough Council, on the recommendation of the works committee, have decided that the making-up of roads, construction of sewers, excavations for new municipal offices, proposed new free library, public baths and washhouses for Plumstead, new recreation ground for Eltham and other works shall be expedited with a view of providing work for the unemployed.

The Chateau d'If, in the port of Marseilles, which has been immortalised by Alexander Dumas, has been let for two years at a rent of 1,000 francs to a speculator, who will charge for admission.

An Exhibition will in all probability be arranged at the British Museum during the coming summer of the series of mezzotint engravings bequeathed to the nation by the late Lord Chylesmore.

Mr. William Le Queux, who is making excavations of Roman remains at Castor, Northamptonshire, on Saturday discovered in a field close to the remains of the ancient Ermine Street the floor and boundary walls of a temple. The floor is 40 feet long by 20 feet wide, beautifully tessellated in a design of white and red, and is in perfect preservation. Quantities of red fresco have been dug out, together with bones, ashes, Roman pottery and glass. In the centre of the floor is a large pear-shaped hollow, about 2 feet deep and 10 feet wide, in the middle of which are remains of the base of the altar.

The Government of South Australia has called for tenders for the construction of a Transcontinental railway, connecting Adelaide and Port Darwin, on the land grant principle. Tenders will shortly be advertised for in England, France, Germany and America.

Mrs. Georgina Buckeridge Roberts, of 14 Hyde Park Mansions, who died on October 16 last, bequeathed to the Science and Art Department of the Kensington Museum such of her collection of Chinese enamel, pottery and embroidery as the director of that department shall select.

Owing to the ruinous condition of the roof of Sherborne Abbey, the splendid groining is in danger. An appeal is to be made for funds to repair the roof.

Two Busts of Sir A. Sullivan, one in marble and one in bronze, were delivered last week to the Royal College and to the Royal Academy of Music. The London County Council have authorised the erection of a bust of the composer on the Thames Embankment, as nearly as possible opposite to and facing towards the Savoy Theatre. Mr. Goscombe John, A.R.A., is the author of the three works.

Mr. David G. Hogarth, M.A., Fellow of Magdalen, has been awarded a grant of 100*l*. from the Craven Fund by the Oxford Convocation in aid of researches and exploration at Naucratis.

The Works Committee of the London County Council have submitted the half-yearly statement of the estimated and actual cost of works carried out by the Works Department, completed during the half-year ended September 30 last. The statement showed that on eighteen works estimated to cost 103,725*l*. there had been a saving, or a balance of cost below estimate, of 9,629*l*, or nearly 10 per cent. The jobbing works also showed a saving amounting in the aggregate to over 2,000*l*.



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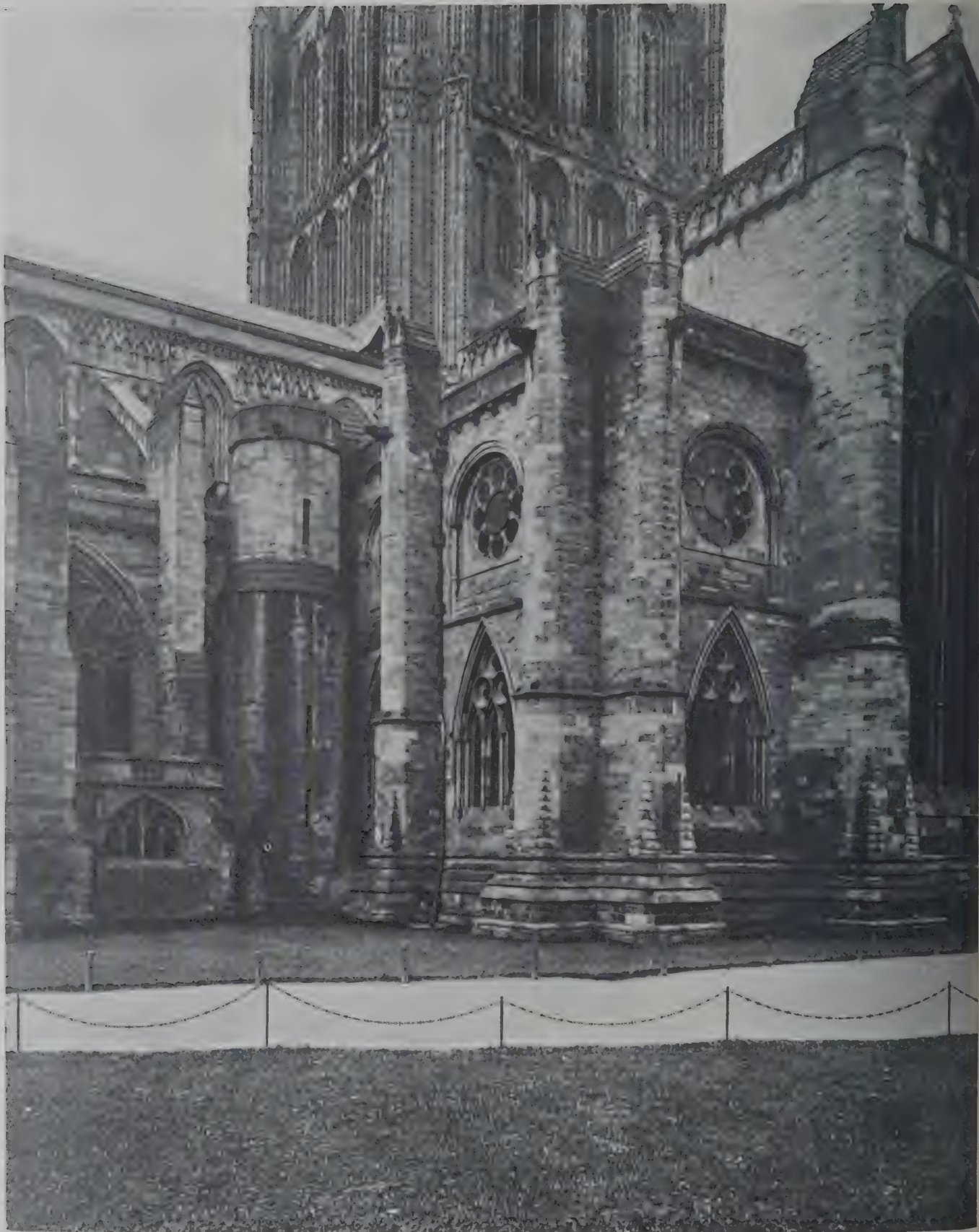


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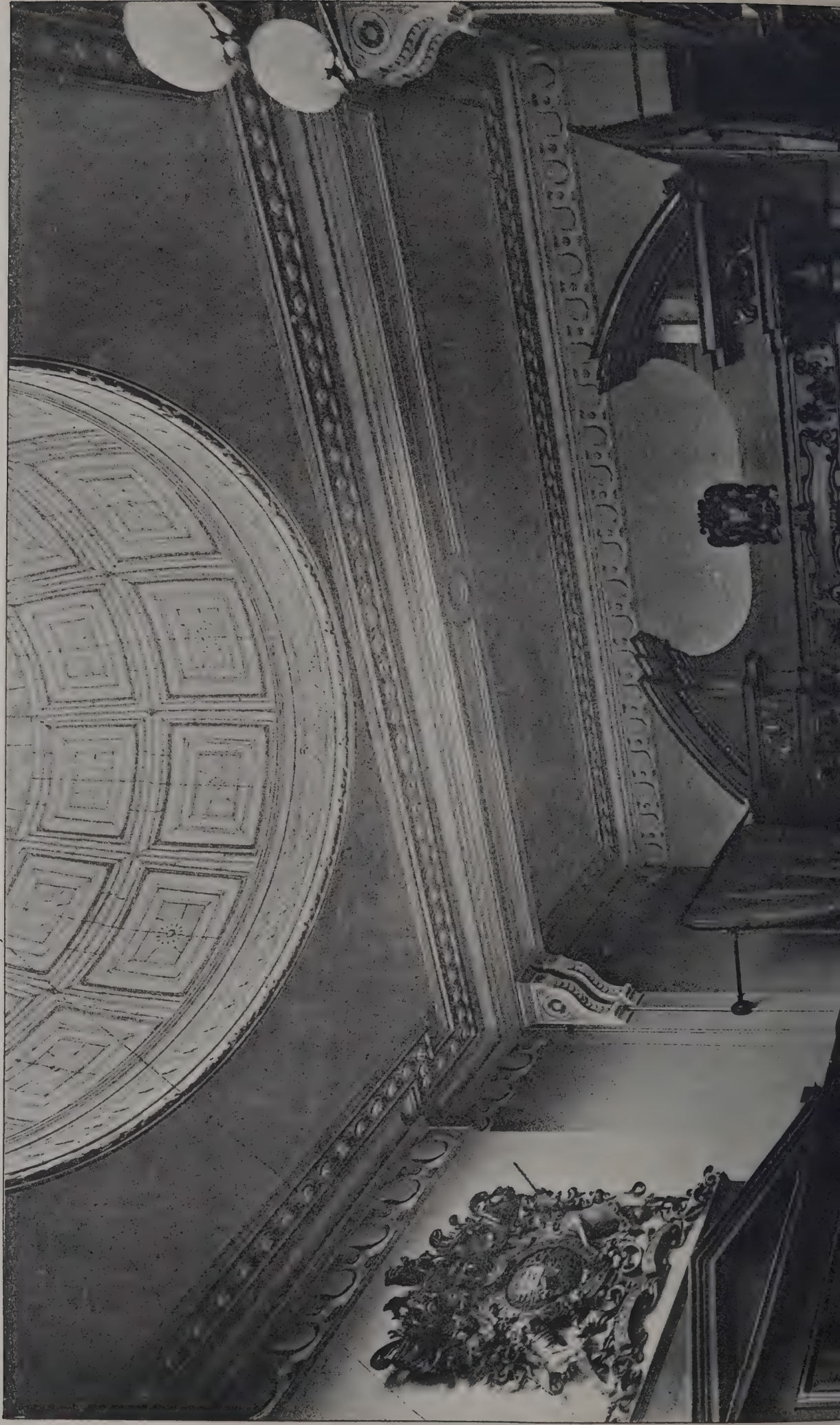




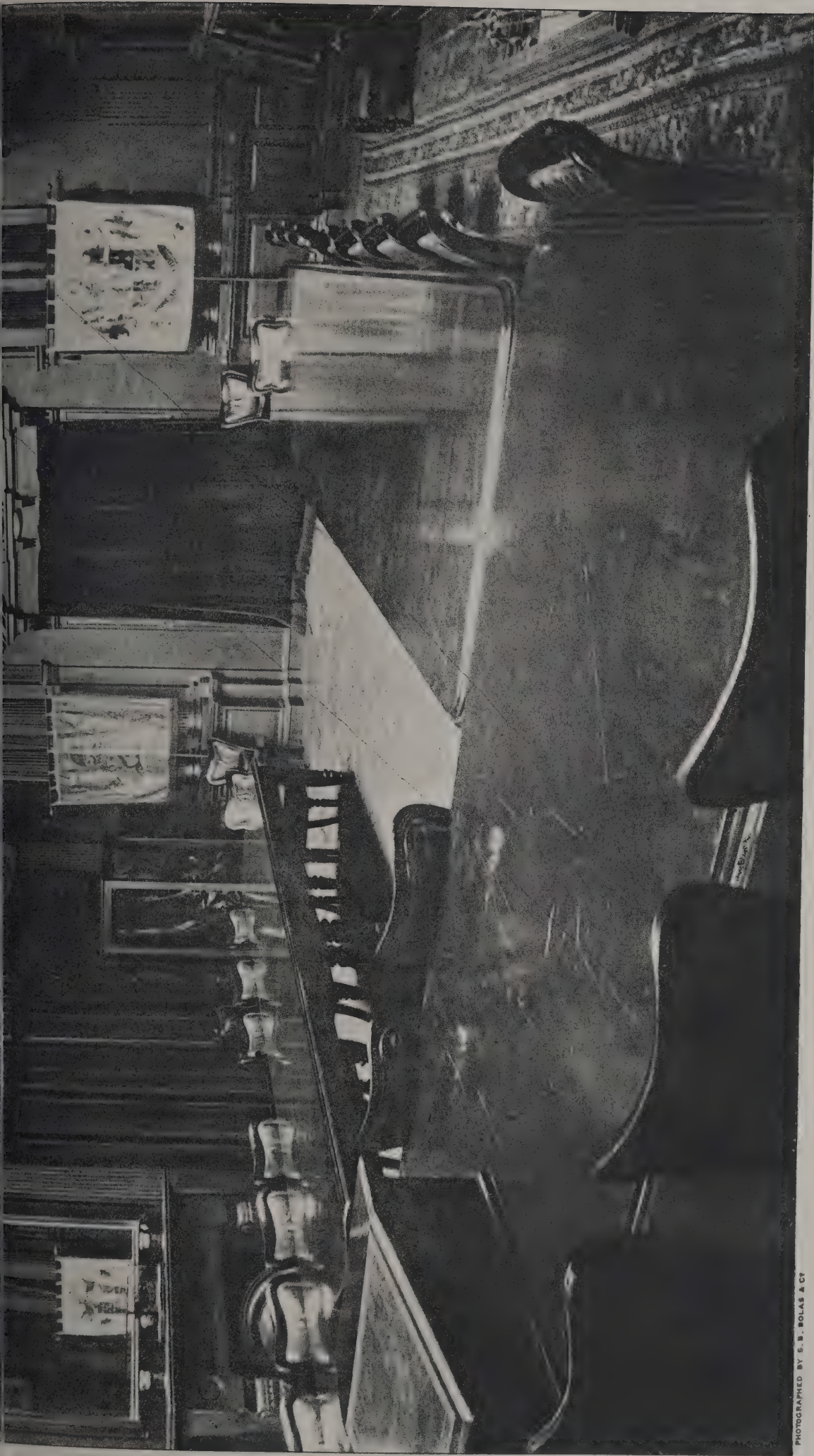




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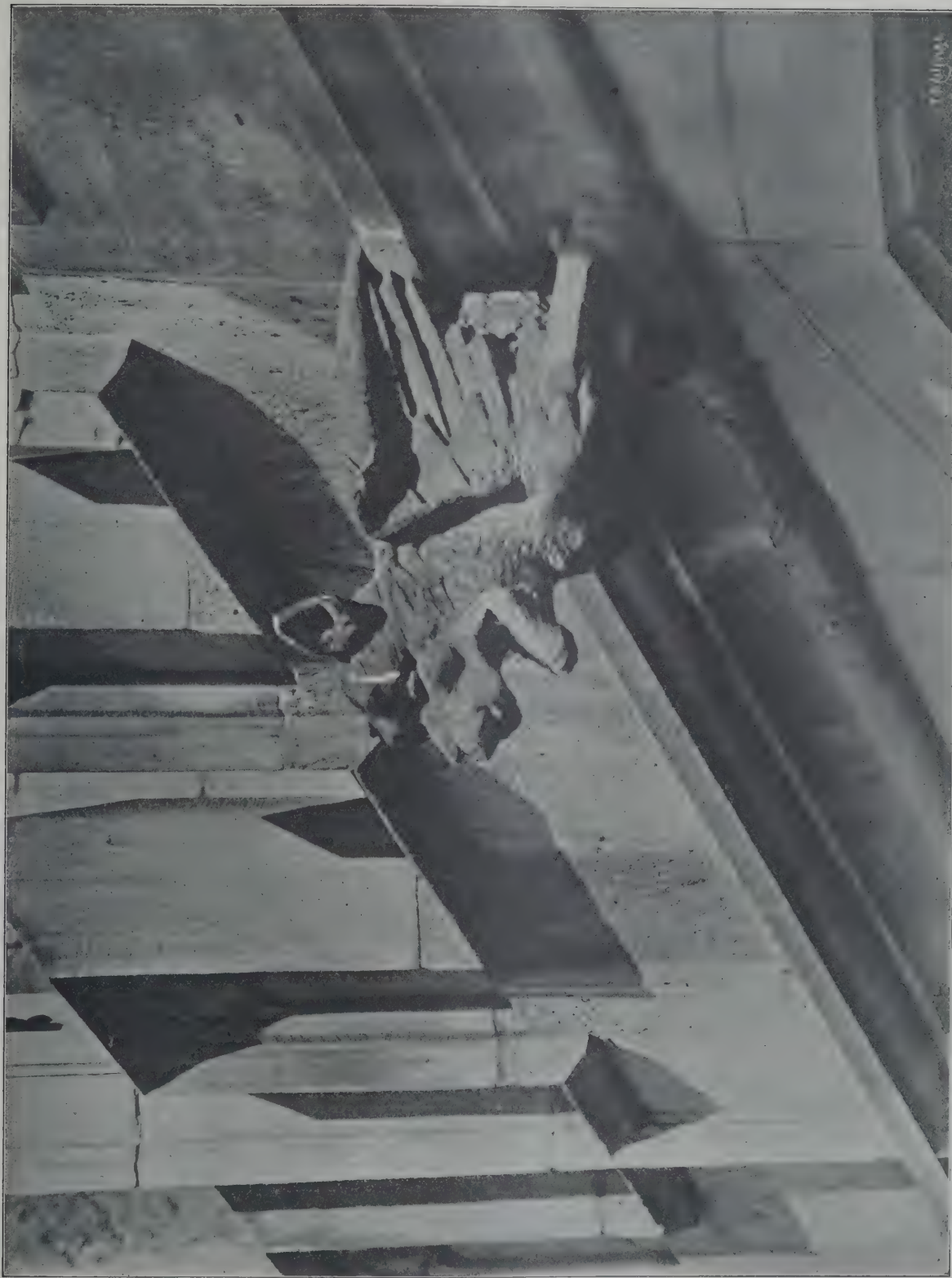


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THE

## Architect and Contract Reporter.

## Important Notice.

Owing to the Christmas Holidays "The Architect" will be published on Wednesday, December 24. All Advertisements, Tenders, Competitions, and Contracts Open intended for insertion in that issue must reach the Office, Imperial Buildings, Ludgate Circus, E.C., not later than 3.30 p.m. on Tuesday, December 23.

## EDITORIAL NOTICES.

*In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

## TENDERS, ETC.

*\*\* As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

## COMPETITIONS OPEN.

ASHTON-IN-MAKERFIELD—Dec. 31.—Designs, &c., are invited for the enlargement of the Infectious Diseases Hospital. The architect whose plans are accepted and approved will be retained by the Council to carry out the work at the usual pro-

fessional charges. Plan of the hospital site, together with full particulars of the alterations and extensions required, may be obtained from Mr. T. Burgess, surveyor, at the Council Offices.

BRIDGWATER.—Feb. 28.—Plans, specifications and estimates are invited in competition for power and appliances to deal with the accumulations of silt in portions of the river Parrett. Mr. W. T. Baker, town clerk, King Square, Bridgewater.

CAPE TOWN.—Jan. 31.—The Council of the University of the Cape of Good Hope invite designs for the erection of university buildings. Premiums of 400*l.*, 200*l.* and 100*l.* will be awarded to the authors of the designs placed first, second and third respectively. Particulars of the competition may be obtained on application to the Registrar at Cape Town, or to the Agent-General in London.

HULL.—Mar. 31.—Designs in competition are invited for the extension of the town hall. Premiums of 300*l.*, 200*l.* and 100*l.* are offered. Mr. E. Laverack, town clerk, Town Hall, Hull.

KINGSTON-ON-THAMES.—Jan. 15.—Plans and designs are invited for a central home and cottage homes for children of both sexes in the Kingston Road, in the parish of New Malden. A premium for the first three selected plans of 25*l.*, 15*l.* and 10*l.* respectively is offered. Mr. Jas. Edgell, clerk, Union Offices, Coombe Lane, Kingston-on-Thames.

ST. IVES, CORNWALL.—Jan. 31.—Competitive plans are invited for the erection of municipal buildings, to consist of a guildhall, council-chamber, jury room, public hall, town clerk's office, surveyor's office, treasurer's office, muniment room, parochial office, mayor's parlour and fire-brigade station and offices. Premiums of 70*l.* and 30*l.* respectively will be awarded to the architects whose plans and specifications are considered to be first and second in order of merit. Mr. Edward Boase, town clerk, Town Clerk's Office, St. Ives, Cornwall.

SUTTON COLDFIELD.—Feb. 20.—Designs are invited for the erection of a town hall adjoining the council house, the total expenditure to be limited to 7,000*l.* Premiums of 50*l.*, 30*l.* and 20*l.* respectively will be awarded for the three best designs in order of merit. Mr. W. A. Clarry, C.E., borough surveyor, Council House, Sutton Coldfield.

## CONTRACTS OPEN.

AUSTRALIA.—Dec. 22.—For erection at Perth, Australia, of a rubbish destructor capable of dealing with forty tons of garbage in eight hours. Mr. W. E. Bold, town clerk, Town Hall, Perth.

BARNSELY.—Dec. 22.—For erection of two houses and outbuildings at Darton. Messrs. Crawshaw & Wilkinson, architects, 13 Regent Street, Barnsley.

BARNSELY.—Dec. 22.—For alterations and additions to house, Gawber Road, Barnsley. Messrs. Crawshaw & Wilkinson, architects, 13 Regent Street, Barnsley.

BETHNAL GREEN.—Jan. 5.—For erection of dormitories maternity wards and other buildings at Waterloo Road workhouse, Bishop's Road, Victoria Park, N.E. Mr. W. A. Finch, architect, 76 Finsbury Pavement, E.C.

BIRMINGHAM.—Dec. 22.—For erection of scullery out-houses, &c., and other alterations at the workhouse, Gravelly Hill. Mr. John North, clerk to Guardians, Vauxhall Road, Birmingham.

BOOTLE.—Jan. 2.—For erection of superstructure of a school for 1,000 children, Linacre Lane, Bootle, Lancs. Mr. Thomas Cox, architect, 11 Dale Street, Liverpool.

BRIDLINGTON.—Dec. 23.—For alterations to 1 and 3 Promenade. Mr. J. Earnshaw, architect, Carlton House, Bridlington.

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BRIDLINGTON.—Jan. 3.—For erection of new terrace steps and alteration of the present steps at Bridlington grammar school. Mr. John Woodmansey, secretary to the Governors, 24 Cambridge Street, Bridlington.

BRIGHTON.—Dec. 23.—For the construction of the permanent way of the tram roads in London Road, St. Peter's Place, York Place, Pavilion Parade, and Old Steine, &c, including the bonding and all contingent works, and paving with wood the whole of the area of such roads, including the tramway tracks. Mr. Francis J. C. May, surveyor, Town Hall, Brighton.

BRISTOL.—Dec. 31.—For second instalment of the superstructure of the Avonbank electricity works, Feeder Road, comprising steelwork, masonry, concrete, &c. Mr. H. Faraday Proctor, city electrical engineer, Temple Back, Bristol.

DORKING.—Dec. 31.—For alterations and repairs at the workhouse. Mr. William Shearburn, architect, South Street, Dorking.

DURHAM.—Jan. 5.—For erection of new Board schools at Heworth. Mr. H. Miller, architect, Felling.

ESSEX.—Jan. 7.—For erection of the Carnegie free library at Grays, Essex, and for furnishing, lighting and heating the same. Mr. Christopher M. Shiner, architect, 6, 7 and 8 Crutched Friars, E.C.

GOOLE.—Dec. 30.—For erection of a mortuary chapel at Swinefleet. Mr. H. B. Thorp, architect, Goole.

GRASMERE.—Jan. 3.—For rebuilding Goody Bridge, Grasmere, Westmorland. Mr. J. Bintley, 7 Lowther Street, Kendal.

GREAT AYTON.—Dec. 29.—For erection of proposed new police-station, &c., at Great Ayton, Yorks. Mr. Walter H. Brierley, county architect, 13 Lendal, York.

HASLINGDEN.—For erection of brick chimney. Messrs. Nicholas, Tomlinson & Sons, Plantation Mill, Haslingden.

HASTINGS.—Dec. 22.—For alterations and additions to the public convenience, Mercer's Bank, Rock-a-Nore, Hastings. Mr. B. F. Meadows, town clerk, Town Hall, Hastings.

HAVERHILL.—Jan. 3.—For rebuilding Melborn Bridge, Haverhill, Suffolk. Mr. A. Ainsworth Hunt, county architect, Sudbury.

HULL.—Dec. 24.—For alterations and additions to 39 and 40 Prospect Street, Hull. Mr. B. S. Jacobs, architect, Lincoln's Inn Buildings, Bowl Alley Lane, Hull.

HULL.—Dec. 31.—For erection of thirty-four artisans' dwellings in Rustenburgh Street. Mr. Joseph H. Hirst, city architect, Town Hall, Hull.

IRELAND.—Dec. 22.—For erection of a church at Ballymahon, co. Longford. Messrs. Hague & McNamara, architects, 50 Dawson Street, Dublin.

IRELAND.—Jan. 1.—For erection of priest's house at Glenville, co. Cork. Mr. Samuel F. Hynes, architect, 21 South Mall, Cork.

IRELAND.—Jan. 6.—For erection of cottages in the various townlands of Strabane. Mr. J. E. Shankie, clerk, District Council Offices, Strabane.

IRELAND.—Dec. 23.—For erection of a new Crown post-office at Limerick. Particulars may be obtained at the Office of Public Works, Dublin.

IRELAND.—Dec. 31.—For erection of twenty-seven labourers' dwellings as follows:—Twenty-three cottages at Howth, three cottages at Maynetown, and one cottage at Killester, Dublin. Mr. John O'Neill, clerk, North Brunswick Street, Dublin.

JARROW.—Dec. 29.—For alterations and additions to the Dunn Street school. Mr. T. H. Spencer, clerk, U.D. School Board, Jarrow.

KESWICK.—For erection of a house at Keswick. Mr. Henry A. Cheers, architect, Twickenham.

KING'S LYNN.—Dec. 23.—For construction of a new wooden floor at the lobby of the corn exchange. Mr. H. J. Weaver, borough surveyor, Town Hall.

LEYTONSTONE.—Jan. 5.—For erection of Norlington Road schools, Leytonstone, Essex. Mr. William Jacques, architect, 2 Fen Court, Fenchurch Street, E.C.

LIVERPOOL.—Dec. 23.—For erection of the proposed head offices for Messrs. Elder, Dempster & Co., in Water Street, Liverpool. Messrs. Briggs & Wolstenholme, architects, 51 North John Street, Liverpool.

MANCHESTER.—Jan. 7.—For putting-in the foundations of the proposed chief fire station and police station in London Road, Fairfield Street, Whitworth Street and Commerce Street. Mr. William Windsor, surveyor, 37 Brown Street, Manchester.

NORTHWICH.—Jan. 6.—For extension of the Victoria Infirmary, Northwich, consisting of ward accommodation for twenty-two beds, operating theatre and other offices. Mr. J. Holland, architect, Hayhurst Street, Northwich.

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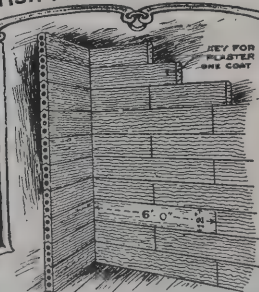
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NOTTINGHAM.—Dec. 22.—For repairs and jobbing work to the properties under their charge for two years, ending December 31, 1904, for the estates committee. Contract No. 1 will be for general builder, bricklayer, slater, mason and plasterer's work; contract No. 2, carpenter and joiner's work; contract No. 3, plumber and glazier's work. Mr. W. Smith, estates surveyor, Guildhall, Nottingham.

RHODESIA.—Feb. 26.—For establishment and working of an electric tramway system, Bulawayo. Messrs. Davis & Soper, 54 St. Mary Axe, London, E.C.

SALE.—Dec. 30.—For street works in the following roads:—Baxter Road, tar macadam; Oldfield Road, ordinary macadam; Lynwood Grove, ordinary macadam; Stanley Grove, sett paving. Mr. W. Holt, surveyor, Council Offices, Sale.

SCOTLAND.—Dec. 23.—For erection of the Anderston district library, Glasgow. Messrs. Stewart & Paterson, architects, 143 West Regent Street, Glasgow.

SCOTLAND.—Dec. 23.—For construction of an underground convenience to be erected in West Campbell Street (at Sauchiehall Lane), Glasgow. Mr. J. Lindsay, clerk, Public Works Department, City Chambers, Glasgow.

SCOTLAND.—Dec. 23.—For erection of public baths and washhouses in Baltic Street, Glasgow. Mr. J. Lindsay, clerk, Public Works Department, City Chambers, Glasgow.

SCOTLAND.—Dec. 27.—For additions to Invercauld Arms hotel, Braemar. Messrs. Jenkins & Marr, architects, 16 Bridge Street, Aberdeen.

SCOTLAND.—Jan. 19.—For erection of new station buildings at Wemyss Bay and Inverkip. Mr. J. Blackburn, secretary, Caledonian Railway Company, 302 Buchanan Street, Glasgow.

TEIGNMOUTH.—Jan. 6.—For extensions and alterations at the gasworks. Mr. J. Alex. Gray, gas engineer, Teignmouth.

TROWBRIDGE.—Jan. 5.—For erection of an isolation hospital for thirty patients at Trowbridge, Wilts. Mr. J. Hugh Goodman, architect, Town Hall Chambers, Reading.

UXBRIDGE.—Dec. 22.—For erection of a bathroom, with hot and cold water services and fittings, and other works at the isolation hospital, Kingston Lane, Hillingdon East. Mr. Bertram Freeman, surveyor, Swiss Cottage, Chiltern View Road, Uxbridge.

WALES.—For alterations and additions to Glanadda infants' school, Bangor. Mr. Harold Hughes, architect, Bangor.

WALES.—Dec. 23.—For erection of one house at Nanthir Road, Blaengarw. Mr. C. Davies, 29 Strand, Blaengarw.

WALES.—Dec. 28.—For erection of twenty-five houses at Pengam. Mr. David Williams, Board schools, Pengam.

WALES.—Dec. 28.—For erection of house and shop at Gwain-cae Gurwain, near Brynamman. Mr. Bartholomew, architect, Greenville House, Brynamman.

WALES.—Dec. 31.—For erection of new business premises at the corner of Alexandra Road and Terrace Road (opposite the railway station), Aberystwyth. Mr. J. Arthur Jones, architect, 7 Queen's Terrace, Aberystwyth.

WALES.—Jan. 5.—For erection of ninety-five cottages at Aber, near Caerphilly. Mr. E. Thomas, 19 Eirw Road, Porth.

WALES.—Jan. 5.—For erection of ninety-five cottages at Abertridwr, near Caerphilly. Mr. Edmund Thomas, 19 Eirw Road, Porth, Pontypridd.

WARRINGTON.—Dec. 22.—For construction of a urinal off Knutsford Road, Latchford. Mr. James Deas, sanitary engineer, Town Hall, Warrington.

WATER FULFORD.—Dec. 31.—For erection of a lunatic asylum at Water Fulford, near the city of York. Mr. A. Creer, architect, Guildhall, York.

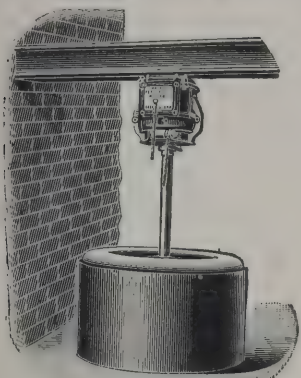
WHITEHAVEN.—Dec. 24.—For erection of two semi-detached houses at Hensingham. Mr. A. Huddart, architect, 22 Lowther Street, Whitehaven.

WOLVERHAMPTON.—Dec. 20.—For supply of about 45 new church benches. The Rev. J. J. Darmody, St. Patrick's, Wolverhampton.

### NEW CATALOGUE.

ONE of the most elegant and artistic catalogues that we have seen for quite a long time is that which has just been prepared by the Electrical Fittings Company, of 38 Conduit Street, New Bond Street, W. It may fitly be described as an album of graceful design. Lavishly got up as to cost and labour, it is printed on superfine thick paper, aesthetically bound, and its hundred and odd pages are adorned with a profusion of designs for electric-light fittings which combine in a rare degree the qualities of elegance, simplicity and refinement; while the prices, which are in all cases fully given, are distinctly moderate. Architects who need to specify for such goods should certainly procure a copy of this admirable catalogue.

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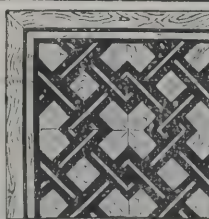
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**TENDERS.****BARKISLAND.**

For erection of a road-roller shed, Barkisland, Yorks. Mr. R. CLEMENTS, surveyor.

*Accepted tenders.*

A. Ingle, The Village, Barkisland, mason	£59	3	3
J. Baron, Lane Ends, Barkisland, joiner	15	15	6
J. Hoyle, Triangle, near Halifax, slater, &c.	18	0	0

**BARNACK.**

For walling, wrought-iron fencing and gates, enclosing the new cemetery at Barnack, Northamptonshire. Mr. J. B. CORBY, architect, 15 All Saints Place, Stamford.

J. Gutteridge	£336	0	0
J. Woolston	298	0	0
Hinson & Co.	295	0	0
Roberts Bros.	260	0	0
W. H. Crowson	251	0	0
Clark & Crowson	250	0	0
HUBBARD BROS., Easton, Stamford (accepted)	224	0	0

**BASINGSTOKE.**

For construction of a 9-inch sewage sewer in Reading Road, of stoneware pipes and partly of iron pipes of special section, and 9-inch surface-water sewers in Sherborne Road and Cliddesden Road. Mr. G. FITTON, borough surveyor.

Mussellwhite & Son	£708	0	0
H. Hill	666	0	0
N. Blake	613	12	0
J. Harris	601	17	6
R. W. Swaker	597	7	0
Collier & Catley	575	0	0
Coston & Co., Ltd.	534	0	0
FREE & SON, Maidenhead (accepted)	501	1	8

**BRADFORD.**

For alterations and additions to Cambridge House, Little Horton Lane, Bradford. Mr. EDGAR H. PARKINSON, architect, Old Bank Chambers, Bradford.

*Accepted tenders.*

Soothill & Balmforth, mason, &c., and joiner.  
W. C. Howroyd, plumber.  
G. Greenwood & Sons, asphalter and concreter.

**CASTLEFORD.**

For laying of a top-water sewer, Ambler Street, Castleford, Yorks. Mr. W. GREEN, surveyor.

C. BIRKILL, Bishopthorpe Road, York (accepted) £132 14 4

**CHELTENHAM.**

For erection of a wall and additions to a shelter at Naunton Park

W. Drew	£139	17	6
C. Malvern & Son	125	0	0
J. Riley	98	10	0
R. Pearce	96	0	0
C. T. CLARK (accepted)	76	5	0

**COLCHESTER.**

For erection of nurses' quarters at the workhouse. Messrs. GOODEY & CRESSALL, architects, Victoria Chambers, Colchester.

F. C. Thurman	£1,095	18	0
A. Luckling	997	0	0
J. G. Smith	960	0	0
R. Beaumont	930	0	0
T. J. Ward	929	0	0
G. & J. Ambrose	925	0	0
Dupont & Co.	899	0	0
J. McKay	869	0	0
W. CHAMPERS, Colchester (accepted)	844	0	0

**CROYDON.**

For erection of a pair of houses at Eden Road, Croydon. Mr. FRANK WINDSOR, architect and surveyor, Bank Buildings, 1 High Street, Croydon.

Bulled & Co.	£1,627	0	0
F. Knight, junr.	1,500	0	0
Huntley Bros.	1,390	0	0
W. Potter	1,390	0	0
W. E. Barnes	1,350	0	0
Smith & Sons	1,328	0	0
E. J. SAUNDERS (accepted)	1,300	0	0

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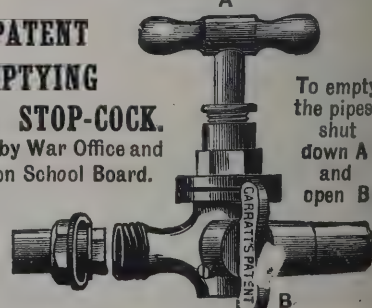
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and  
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Bailey & Fry	19,322	10	0
Batley, Son & Holness	19,197	0	0
Chambers Bros.	18,221	0	0
C. H. Hunt & Sons	18,191	0	0

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Roadway.

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E. Parry	570	0	0
G. Wimpey & Co.	562	0	0
Lawrence & Thacker	561	0	0
B. Nowell & Co.	546	0	0
J. Weston	487	0	0

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Patent Indurated Stone Co.	118	5	0
Patent Victoria Stone Co.	114	0	0

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W. F. DITCH, 2 Nalloway Villas (accepted) £197 0 0

HOVE.

For street and other works in Granville Road. Mr. H. H. SCOTT, borough surveyor.

J. PARSONS & SONS, 118 Church Road (accepted) £394 0 0

HOUNSLOW.

For alterations and additions to 82-84 High Street, Hounslow, Middlesex. Mr. W. A. DAVIES, architect, Town Hall Chambers, High Street, Hounslow. Quantities supplied.

Contract A.

D. D. Heath	£1,950	10	0
C. Emmett	1,644	17	11
W. IRWIN, Islington (accepted)	1,548	0	0
A. Westbrook	1,525	0	0

Contract B.

A. Westbrook	925	0	0
C. Emmett	887	0	3
W. Irwin	849	0	0

For additions to 86 High Street, Hounslow. Mr. W. A. DAVIES, architect.

W. IRWIN (accepted) £660 0 0

For erection of four shops at the corner of Lampton Road, High Street, Hounslow. Mr. W. A. DAVIES, architect, Town Hall Chambers, Hounslow.

H. Eydmann	£5,700	0	0
C. Emmett	5,575	0	0
J. Macklin	5,552	0	0
T. Nickols	5,540	0	0
J. Dorey & Sons	5,500	0	0
W. Wisdom	5,395	0	0
T. Hiscock	5,250	0	0
W. Irwin	5,250	0	0

For street and sewerage works on the Kingsley estate, Hounslow. Mr. W. A. DAVIES, engineer.

J. Macklin	£1,768	0	0
S. Kavanagh	1,698	0	0
Mowlem & Co.	1,619	0	0
Lawrence & Thacker	1,522	0	0

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Wilson & Lamplough	291	0	0
T. Hooper & Son	285	0	0
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Hibberd Bros.	261	0	0
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F. & F. J. Wood	268	0	0
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E. P. Bulled & Co.	1,772	0	0
Rice & Son	1,741	0	0
W. J. Mitchell & Son	1,736	0	0
T. D. Leng	1,706	0	0
J. Smith & Sons, Ltd.	1,693	0	0
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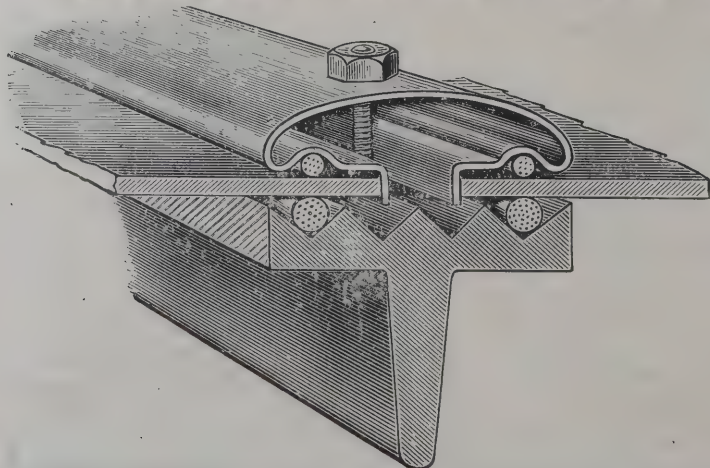
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E. FLOOD (accepted) . . . . .	232	0	0

*Fair Street.*

J. Harries & Co . . . . .	£310	0	0
J. Smith & Sons, Ltd. . . . .	280	0	0
Johnson & Co. . . . .	263	10	0
W. Sayer & Son . . . . .	258	10	0
Belcher & Co., Ltd. . . . .	253	12	0
J. Greenwood . . . . .	251	15	0
Lathey Bros. . . . .	209	10	0
H. J. WILLIAMS (accepted) . . . . .	175	0	0

*Hatfield Street.*

E. Flood . . . . .	£299	0	0
W. Downs . . . . .	279	0	0
J. Harries & Co. . . . .	270	0	0
Belcher & Co. Ltd. . . . .	257	15	0
Johnson & Co. . . . .	256	0	0
G. Brittain . . . . .	220	0	0
W. Hornett . . . . .	207	0	0
J. R. SIMS (accepted) . . . . .	161	0	0

*Atley Road.*

A. E. Symes . . . . .	£375	0	0
W. Silk & Son . . . . .	358	0	0
A. J. Sheffield . . . . .	357	0	0
Viney & Stone . . . . .	351	0	0
Vigor & Co. . . . .	307	10	0
T. S. Elkington & Sons . . . . .	288	15	4
A. W. Derby . . . . .	276	10	0
D. Gibb & Co. . . . .	269	0	0
J. F. HOLLIDAY (accepted) . . . . .	255	11	0

## LONDON SCHOOL BOARD—continued.

*Berner Street.*

Viney & Stone . . . . .	£312	0	0
J. F. Holliday . . . . .	268	18	0
Barrett & Power . . . . .	252	0	0
D. Gibb & Co. . . . .	245	0	0
Vigor & Co. . . . .	229	0	0
G. Barker . . . . .	219	15	0
J. HAYDON & SONS (accepted) . . . . .	206	0	0

*Waterloo Road.*

W. Downs . . . . .	£315	0	0
Martin, Wells & Co., Ltd. . . . .	215	0	0
G. Brittain . . . . .	210	0	0
Rice & Son . . . . .	208	0	0
Johnson & Co. . . . .	207	0	0
Maxwell Bros., Ltd. . . . .	178	0	0
H. J. Williams . . . . .	177	10	0
J. F. FORD (accepted) . . . . .	174	0	0

*Medburn Street.*

T. Cruwys . . . . .	£465	0	0
M. Pearson . . . . .	449	0	0
Viney & Stone . . . . .	384	0	0
H. Wall & Co. . . . .	339	0	0
W. Chappell . . . . .	320	0	0
Stevens Bros. . . . .	317	0	0
Marchant & Hirst . . . . .	316	0	0
THOMPSON & BEVERIDGE (accepted) . . . . .	298	0	0

*Frogmore.*

C. Curd & Sons . . . . .	£90	0	0
Green & Twilley . . . . .	82	0	0
Hudson Bros. . . . .	67	0	0
J. Garrett & Son . . . . .	64	0	0
R. S. RONALD (accepted) . . . . .	60	0	0

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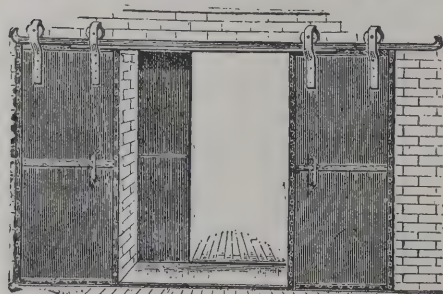
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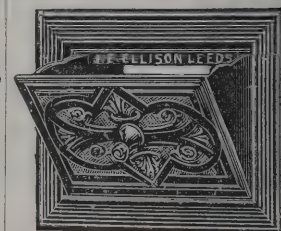
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Paramor	9,308	0	0
Denne	8,988	0	0
Smith	8,963	0	0
Wing	7,768	0	0
Martin	7,610	0	0
Brown	7,557	0	0
Game	7,474	0	0
Adcock	7,416	0	0
Denne	7,312	0	0
BROWNING, Canterbury (accepted)	6,986	0	0

ST. LEONARDS-ON-SEA.

For enlargement of Hollington schools. Mr. CHARLES A. PIGOTT, architect, Saxon Chambers, St. Leonards. Quantities by architect.

Gann & Co.	£3,200	0	0
Tapner, Simmonds & Co.	3,150	0	0
F. Tingle	3,091	0	0
J. Parker	3,073	0	0
C. Hughes	3,062	0	0
A. H. White	2,999	0	0
H. E. Cruttenden & Son	2,997	0	0
Padgham & Hutchinson	2,925	0	0
J. Harvey	2,875	0	0
H. Ashdown	2,873	5	0
J. M. LESTER, Earl Street Works, Hastings (accepted)	2,797	0	0

SCOTLAND.

For 500 yards of pipe track, providing and laying cast-iron pipes for water-supply, at Edzell.

D. Brown	£82	0	0
A. Smith	75	14	9
J. A. M. Fox	66	16	0
Ferguson & Corser	64	17	6
J. Kennear & Son	63	8	6
C. Middleton & Son	62	13	5
J. BAXTER, Park Road, Brechin (accepted)	62	12	0

SOUTHGATE.

For supply of fire hydrants and fire appliances.

Accepted tenders.

J. Blakeborough & Sons, Brighthouse, 150 fire hydrants and surface boxes complete.  
Merryweather & Sons, Ltd, Greenwich, S.E., additional fire appliances.

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For erection of the electric-light station.

MacDonald Brothers	£5,768	4	4
Messom & Co.	5,359	0	0
Oldridge & Son	4,777	3	9
Kavanagh & Co.	4,665	12	9
F. Hankey	4,578	7	11
Gaze & Sons	4,539	17	3
HOCKLEY & SON, Grantham (accepted)	4,455	15	1

WALES.

For erection of a warehouse at the Bute Docks, Cardiff. Mr. EDGAR G. C. DOWN, architect, 31 High Street, Cardiff.

G. Beard	£2,397	0	0
D. Davies	2,395	0	0
H. Lattey & Co., Ltd.	2,315	0	0
S. Wood	2,072	0	0
W. T. Morgan	2,050	0	0
W. Thomas & Co.	2,049	13	10
W. Symonds & Co.	1,999	0	0
E. R. Evans & Bros.	1,950	0	0
E. Turner & Sons	1,948	0	0
A. W. Cadwallader	1,900	0	0
KNOX & WELLS, Bangor Road, Cardiff (accepted)	1,888	0	0

WELLINGBOROUGH.

For sewerage works at Earls Barton. Messrs. SHARMAN & ARCHER, surveyors.

R. Marriott	£150	0	0
W. G. Wilmott	141	0	0
S. Knight	138	10	0
Goodman & Murkett	118	0	0
W. SMART, Denton, Northampton (accepted)	108	10	0

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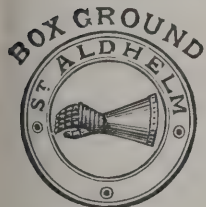
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*Received too late for Classification.*

### COMPETITION OPEN.

WALES.—Designs are invited for new public offices which it is proposed to erect at Pontypridd. Mr. J. Colenso Jones, District Council Offices, Pontypridd.

### CONTRACTS OPEN.

SCOTLAND.—Dec. 23.—For electric lighting of district library, Anderston. Messrs. Stewart & Paterson, architects, 143 West Regent Street, Glasgow.

WALTHAMSTOW.—Dec. 23.—For the construction of about 480 lineal yards of 9-inch stoneware pipe sewer, with all necessary manholes, &c., in Oak Hill Road. Mr. George W. Holmes, engineer to the District Council, Town Hall, Walthamstow.

### TRADE NOTES.

THE new infectious diseases hospital, Bury, is being warmed and ventilated by means of Shorland's patent double-fronted Manchester stoves with descending smoke flues, patent Manchester grates, exhaust roof and inlet ventilators.

THE Foundry Wesleyan chapel, Hayle, Cornwall, has recently been fitted with the well-known "Small Tube" hot-water heating apparatus by Messrs John King, Ltd., engineers, Liverpool, employing their latest improved economical coil heater.

MESSRS. ANDREW HANDYSIDE & CO., LTD., of Derby and London, makers of steel roofs, bridges, buildings and structures, have received the contract for the supply and erection complete of steelwork for roof over generating station for Messrs. Harland & Wolff's shipyard at Belfast.

THE inhabitants of Bentham and district (Yorks) are going to commemorate the Coronation by erecting a large clock at the town hall, with three external illuminated dials, and striking the hours on a new bell. The order has been placed with Messrs. W. Potts & Sons, clock manufacturers, Leeds.

MESSRS. GOODWIN, BARSBY & CO., engineers and iron-founders, St. Margaret's Ironworks, Watling Street, Leicester, inform us that they have been successful in securing an order for one of their patent Acme portable stone breakers, with new patent portable screening apparatus, from the Urban District Council, Holyhead.

AT Moulton, Northampton, a large church clock having two dials, each 6 feet 6 inches diameter, facing west and south, with Cambridge chimes on four bells, was completed on the 11th inst., and formally started and dedicated on that day by the Dean of Peterborough. The clock is to the designs of Lord Grimthorpe, and the work has been carried out by Messrs. John Smith & Sons, Midland Clock Works, Derby.

MR. GEO. SHREWSBURY, of Calda Works, Station Road, Camberwell, manufacturer of the "Calda" instantaneous water-heater for baths, &c., draws our attention to the fact that it is now over twenty-five years since the first introduction of this heater (which has been improved later), and respecting which he claims that no accident has been recorded against it. By Mr. Shrewsbury's system perfect ventilation is insured, a matter which is obviously of primary importance. Mr. Shrewsbury holds numerous testimonials from users during a long period of his "Caldas," and notably one respecting a machine which has been in use for upwards of twenty years, and is still in full working order.

MESSRS. KAYE & CO., LTD, manufacturers of Portland cement, Southam Works, Rugby, have just completed an installation of new grinding machinery which enables them to meet the growing demand for finely ground cement. For the future their ordinary grade will be one giving under 10 per cent of residue on a 76 mesh sieve—5,776 holes to the square inch (the ordinary grade hitherto has left upwards of 20 per cent of residue on this sieve). This increased fineness will much enhance the value of the cement by the enlargement of its covering power or sand-carrying capacity. It will thus be possible to make cement go further by using more sand, &c., with it, or if it is preferred to adhere to the same proportions as before greater strength in the work executed with it will be attained.

MESSRS. MACARTNEY, M'ELROY & CO., LTD, contracting engineers, of London, have obtained the contract to equip Lorenzo Marques, Delagoa Bay, with a complete system of electric tramways, including power-station, rolling-stock, track and overhead lines. The value of the contract is estimated at 100,000/-. There was very keen competition from German and American engineering firms, but Messrs. Macartney, M'Elroy & Co undertook to complete the work in three years, the time a German firm required, while their tender was under that of the Americans.

## WILSON'S PATENT "MULTILUX" WINDOWS

### PRICE

5/- per foot super.

Wilson's Patent  
"SAFETY" Pavement  
Lights prevent slipping

Wilson's "DIOPTRIC"  
Pavement Lights are  
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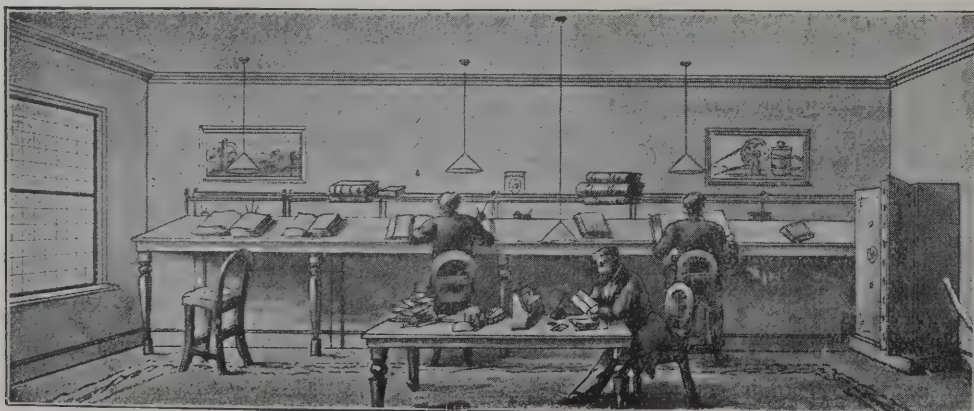
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The above illustrates an office where the light coming from the sky falls on to the floor and is absorbed, thus leaving the back part of the room dark. The illustration below shows the same room with WILSON'S PATENT MULTILUX WINDOW fixed. This refracts the rays of light and throws them horizontally, thus preventing them falling on to the floor, and lighting up the whole room.





**ILLUSTRATIONS.**

STIELLING HALL, STOCKSFIELD, AND SOUTH FRONT.

SEMI-DETACHED HOUSES, WESTGATE-ON-SEA.

"THE OBSERVATORY," WESTGATE-ON-SEA.

COACHMAKERS' HALL, NOBLE STREET.

CATHEDRAL SERIES: HEREFORD.—CORNER OF NORTH TRANSEPT.  
GARGOYLE IN CLOISTERS.**ELECTRIC NOTES.**

THE vicar and churchwardens of the Saltburn parish church have accepted the tender of Messrs. Hutton & Walker—wiring 150*l.*, fittings 100*l.* 3*s.*—for the electric lighting of the edifice.

THE town clerk of Dalkeith has received from the electric-lighting company which the Town Council some time ago agreed to employ the proposed scheme for the lighting of the burgh. The underground mains are to consist of single bitumen insulated cables laid in pairs in specially treated wooden troughing filled in solid with pure bitumen and covered with substantial tiles. For the most part they will be laid under the roadways to avoid the cutting of the cement pavements. A number of pillars will be erected on the pavements for the purpose of dividing up and inserting fuses in the feeders and distributors, so that in the case of a branch main developing a fault, that particular section only will be automatically isolated. The houses will be connected with the mains by means of twin cables insulated with bitumen, and the whole will be steel-armoured. The overhead mains will consist of bare copper wire supported on insulators fixed to steel poles 40 yards apart. Houses will receive their light by bare copper strained from the nearest pole to insulators fixed on to the dwellings. The company propose to at once extend the overhead mains beyond the compulsory area, and erect these in Park Road, Newbattle Road and Waverley Road, in the Eskbank district. A suitable site has been secured by the company in Croft Street for the generating station. The details will come before the next meeting of the electric-lighting committee.

IN the Court of Appeal, composed of Lords Justices Vaughan Williams, Stirling and Cozens-Hardy, a considered judgment was delivered in the case of Ferranti *v* the British Thomson-Houston Company, Ltd., on the appeal of the plaintiff, Mr S. Z. de Ferranti, electrical engineer, of Hollinwood, from a decision of Mr. Justice Swinfen Eady giving judgment for defendants, who carry on business at Rugby. Plaintiff's action against defendants was for alleged infringement of a patent for improvements in metres for measuring electricity. The difficulty which Mr. Ferranti applied himself to was to get some method by which slight friction could be overcome so as to allow a metre to start with only a small load of lights on. What Mr. Ferranti did was to reinforce by a constant factor the power of the stationary field, the constant factor being outside any immediate influence upon the lamp currents. Plaintiff's case was that defendants had infringed his patent in having in a Watt metre, which measured both pressure and current, using a little coil which had exactly the same effect or general influence as the coil which was invented by the plaintiff for giving a constant reinforcing power to the stationary part of the magnetic field by a constant factor independent of the lamp current. Mr Justice Swinfen Eady held that on the construction of plaintiff's complete specification defendants had not infringed plaintiff's patent. Hence the present appeal of the plaintiff. Lord Justice Stirling read the judgment of the court, holding that defendants had not infringed plaintiff's patent, and dismissing the appeal with costs.

**BUILDING AND BUILDERS.**

THE Wesleyans of Gorse Hill, Stretford, Manchester, have secured a site in Chester Road for building a mission church.

IT has been decided to erect a new Wesleyan church at Carlisle at a cost of from 12,000*l.* to 14,000*l.*

THE memorial-stone was laid on the 13th inst. of a new United Free church at Cleland. The church, which is nearing completion on a site in Carfin Road, will be seated for 460, and the total cost (which also covers the erection of a church hall) will be 2,000*l.*

THE half-yearly general meeting of the Lancashire, Cheshire and North Wales Building Trades Employers' Federation was held on the 10th inst. at the Mosley Hotel, Piccadilly, Manchester, when Mr. George Macfarlane, of



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ALSO AT LIVERPOOL, MANCHESTER, PARIS, AND CAPE TOWN.



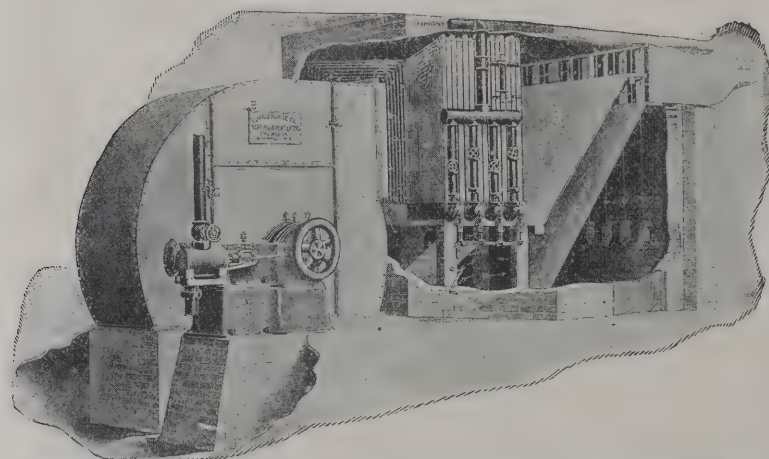
Manchester, the president of the Federation, was in the chair, and there were present Messrs. Samuel Smethurst, of Oldham, H. Lever, A. G. White and W. Tomkinson, of Liverpool, T. H. Kellett, of Preston, James Storrs, of Stalybridge, and about fifty other representatives from all the important towns of Lancashire and Cheshire. The Chairman congratulated the members on the continued success of the Society, and said he hoped that no efforts would be spared to strengthen and extend its influence. They had at present a membership of nearly 2,000, but he hoped that measures that were down for their consideration that day would have the result of nearly doubling that membership, and thus forming one of the strongest building trades employers' organisations in the country. Many matters of trade interest were discussed. In the evening the annual dinner of the Federation was held. Mr. Macfarlane again presided.

SOME ten days ago the operative plasterers engaged on the extension of the buildings at Marle Hall, near Llandudno, which are being carried out for the Birmingham Hospital Saturday Fund by a Birmingham firm of builders, gave notice for an increase of wages, and notified their employer that unless the demand was granted they should cease work. The demand, which was in effect to raise the standard rate payable in the Llandudno district to the standard rate payable in the Birmingham district, was refused, and as a consequence the men struck, and the progress of the work will consequently be delayed, and especially so should the weather remain open. The men, it is said, are acting under the instructions of the executive council of the National Association of Operative Plasterers, and contend that inasmuch as the work at Marle Hall is being carried out by a Birmingham firm the rate of wages recognised as the standard in Birmingham ought to be paid. The employers repudiate the demand, and point out that the operatives were engaged at the job and come from the district. It is further pointed out that plasterers employed by local firms and the operatives in the other branches of the trade are content to work for the standard rate of pay for Llandudno and the district. Unless the men come to a reasonable understanding the completion of the convalescent home extensions will be considerably interfered with.

THE plans for the projected extension of the docks at Dunkirk, which have already been voted by the Chamber of Deputies, have been laid before the Senate. These plans comprise the lengthening of Nos 3 and 4 basins of the Freycinet Docks, by which a mile of quays, with a depth of 26 feet of

water, will be added to the existing accommodation, the removal of the western fortifications, and the acquisition of ground for further extension of the docks. The Chief Engineer of the Ports et Chaussées of the port points out to the Senate that the project will enable Dunkirk to afford the accommodation urgently required for the growing trade of the port, and to provide for further extensions, the necessity of which is already foreseen. The increase of tonnage in 1901 amounted to 202,000 tons, and this would have been still greater had the port been able to provide berths for several lines of steamers which had applied for room. The new quays will accommodate five or six new lines of steamers besides providing berths for outside boats. As regards the military side of the question, the fortifications to the west of the town will be replaced by a large fort, to be built near the shore to the westward of the place destined for future dock extension, and a second fort to the south-west, at the head of a new moat for defensive purposes, leading to the sea front. The outlay on military works will be 11,250,000 fr., and that affecting the port 12,000,000 fr., of which sum the Chamber of Commerce and the Municipality of Dunkirk offer to bear 8,220,000 fr., or over two-thirds of the estimated expenditure.

A NEW church is now in course of erection on Silver Road, at a point just opposite Knowsley Road, Norwich, and the foundation-stone was laid on the 1st inst. by Sir Samuel Hoare, Bart., M.P. According to the designs of the architect, Mr. A. J. Lacey, the new church, which will be dedicated to St. Mary Magdalene, will consist of nave with four bays, and possibly even five, north and south aisles, western porch and baptistery, a chancel of two bays and clergy and choir vestries, with heating chamber under one of them. For monetary reasons, it is not intended to carry out the whole of the scheme at once. The tender accepted comes to something under 3,000l., towards which sum 1,000l. has been contributed from the Bishop's Fund. At present all that is intended is to build the chancel and two bays of the nave, leaving out the vestries. For the present also the benches will be omitted, and chairs will be used for the seating. The design of the structure may be described as of Later Perpendicular style. The walls will be built of brick and blue lias stone lime, faced externally with local flints and Monk's Park stone. The roof will be of pitch pine, while the nave roof will be covered with Broseley tiles and the aisles with Cumberland green slates. The walls internally will be stuccoed. The floors under the seating will be laid solidly upon coke breeze



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PLENUM  
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## BUFFALO FORGE COMPANY,

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## Office Cabinet.



Made in Wainscot Oak, fitted with Patent  
Simultaneous Lock.

Twelve Drawer Cabinet ... £4 : 17 : 6  
Sixteen " " ... £6 : 0 : 0

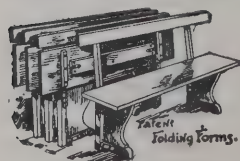
Size of drawer inside, 15-in. x 11-in. x 4-in.



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## ROBERTSON'S FURNITURE, L<sup>D</sup>. CATHCART, GLASGOW.



ROBERTSON'S PATENT  
REMOVABLE  
PANELLING,  
SHELVING,  
COUNTERS, &c.



Patent Automatic Chairs.

Entire Seating of a Hall folded flat round  
walls, for Social Gatherings, Drill, &c.  
Entire satisfaction where in use.

15 per cent. more seated.  
Increased Revenue.  
Rows can be spaced 24 in. apart.  
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concrete, the paths of the nave will be laid with encaustic tiles and the chancel and sanctuary floors with encaustic tiles of a better quality. There will be a fine east window, consisting of five lights, which has been designed in the anticipation that some day it will be filled with stained glass. The other windows will be glazed with cathedral glass. A tower does not enter into the building scheme, but a bell gable will be erected at the west end, when the remaining bays of the nave are completed. The church when finished will accommodate 500 worshippers, which is 150 more than the portions to be built forthwith will contain.

### VARIETIES.

THE Bishop of Durham recently opened and dedicated the newly-erected Seamen's Mission Hall in Church Street, West Hartlepool, just completed at a cost of 5,500l.

AN hotel building has just collapsed in Sheffield. Extensive alterations were proceeding at West End Hotel, Glossop Road, and as the premises showed signs of insecurity the customers hurriedly left, the landlord and family also quitting the building. The anticipated collapse eventually came with a tremendous crash, the premises being a mere heap of ruins. No one was injured, but the landlord sustained a heavy loss by the destruction of his furniture.

AFTER extensive restoration Little Marlow Church, Bucks, has been reopened. The remarkably fine fourteenth-century roofs in the two aisles and the chantry (or Ledewich chapel) have been discovered rather than, in the common sense of the word, "restored." The oak casing introduced has been fixed between the tiles and the old timbers, so that the beautiful appearance of the old roofs is perfectly exposed. Several relics of the pre-Reformation period have been recovered and carefully dealt with, and the whole church is rendered ecclesiastically beautiful in appearance.

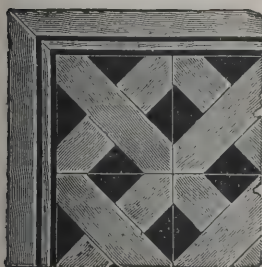
MR. WILLIAM LE QUEUX, who is making some important excavations of Roman remains at Castor, Northamptonshire, recently made an interesting discovery in a field close to the remains of the ancient Ermine Street, viz the floor and boundary walls of a temple believed to be dedicated to Jupiter. The floor is 40 feet long by 20 feet wide, beautifully tessellated in a design of white and red, and is in perfect preservation. Quantities of brilliant red fresco have been dug out, together with bones, ashes, Roman pottery and glass. In the centre of

the floor is a large pear-shaped hollow, about 2 feet deep and 10 feet wide, in the centre of which are remains of the base of the altar.

SOME very old buildings situate at the corner of High Street and Ely Street, Stratford-on-Avon, are being reconstructed, and the workmen excavating beneath a floor discovered a quantity of elaborately-carved and moulded stones. These have just been examined and found to consist of massive window tracery of Geometrical design. It is the opinion of several persons who have inspected the stones that they probably belonged to the original chapel of the Guild of the Holy Cross, which was erected in the year 1269 by Robert de Stratford. The chapel was situated near to the spot where the discovery has been made, and was taken down towards the end of the reign of Henry VII. (about 1503) when the present guild chapel was built on the same site by Sir Hugh Clopton. The buildings undergoing alterations are of that date, and the stones were doubtless carried there by the builders and used in the foundations.

SOME interesting discoveries have been made during the progress of some restorations at Alphamstone Church, Essex. When the old plaster was scraped off one of the chancel walls was found to be built, not of flint like the others, but of red bricks, with here and there white stones of various shapes and sizes. One of these being extracted, it was found, although somewhat damaged, to be beautifully moulded on the inner side. Large numbers of similar stones have been removed, and the work is still in progress. Practically all of the stones which originally formed the sedilia have been recovered, besides numbers of others which form portions of the tracery of what was apparently a fine window. Five small inscriptions have been found on these stones which, it is hoped, may be deciphered. Alphamstone Church is of great antiquity, and is of especial interest apart from these discoveries. It has an unusually fine chancel arch, which until the present work was begun was entirely covered with plaster. The font, which is believed to be 700 years old, was likewise plastered.

AT the third sessional papers meeting of the Manchester Society of Architects, held on the 11th inst., Mr. P. S. Worthington contributed an interesting paper on "Homes of the Monks during the Middle Ages." Mr. Worthington, who has been fortunate enough to visit many of the principal abbeys and monastic remains at home and abroad, dealt with the subject from an architectural point of view, and showed him-



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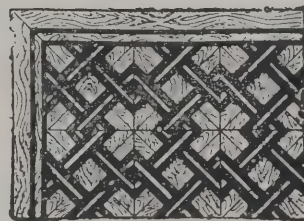
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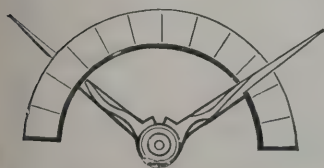
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seif well able to prove his contention that brilliant as were other epochs in architectural history, the results of the eleventh, twelfth, thirteenth and fourteenth centuries stood completely by themselves and appealed as a whole to Northern minds more than any other four consecutive centuries in the world's history. With regard to the general arrangement of the buildings in connection with some of the abbeys, the speaker said that modern architects could scarcely suggest an improvement. Fourteen sets of designs for the students' monthly competition were on exhibition. The subject was a cottage hospital. The prize in the Senior Division was awarded to Mr. C. Birchenall, and in the Junior to Mr. G. L. Cockrell, while Mr. T. H. Hill's design received honourable mention.

IN the course of a careful restoration of the ancient church of Castle Donington, Notts, several interesting discoveries were made, including two recesses, one on either side of the chancel arch and adjoining the choir. These have been partially built up for the purposes of adding to the strength of the columns. A hagioscope was also reopened, giving a view from the south door to the Communion table. An ancient doorway on the north side of the chancel has also come to light. The new oaken door on the south side is included in the restoration scheme. An ancient piscina was discovered quite accidentally during the operations, whilst the sedilia has been so restored as to be ready for use by the clergy when necessary. As far as possible the walls have been pointed within and without, and faced with plaster on the interior. A curious small window, immediately over the hagioscope, is shortly to be replaced by a stained light representing the Nativity. By far the most striking feature of the whole of the restoration scheme is the magnificent stained window which occupies a commanding position at the eastern end of the building. The total cost of the restoration is approximately 2,000l.

THE new Wesleyan mission hall in Cowley Road (City Road) Walton, Lincs, has been formally opened. An offshoot of the County Road chapel, it stands in the centre of a large new neighbourhood, and has seating accommodation for 400 people. The premises are situate between Cowley Road and Bodmin Road on a plot of freehold land acquired by the trustees a few years ago. The building comprises:—Hall, 48 feet by 28 feet, with two transepts 16 feet by 12 feet each; a schoolroom or lecture hall, 30 feet by 23 feet; minister's vestry, 16 feet by 13 feet; ladies' cloak-room, with conveniences, also scullery fitted with sink, boiler, &c. There are three cellars for coals, heating apparatus and storage. The whole

is brick built. The frontages to the main roads are faced with Enfield pressed bricks. The internal woodwork is of pitch pine, varnished. The principal entrance is from Cowley Road, where there are porch and vestibules with tiled floors. There is a separate entrance from Bodmin Road, which will enable the services of the Sunday school and the hall to be carried on apart. The hall is fitted with a neat rostrum of varnished pitch pine, a portion of the panels being fitted with red cloth, giving a pleasant relief. The hall and schools are lighted by reflex pendants. The heating is by low-pressure hot-water Beeston radiators and Mona sectional boiler. The ventilation is by Tobin inlet tubes and roof extractors, the latter being connected with the ceiling gratings by galvanised iron tubing. The whole has been designed by and carried out under the supervision of Mr. H. E. Peach, architect, Southport.

THE new Wesleyan school church which has been erected at Clifton, Yorks, was formally opened on the 11th inst. It will hold a congregation of about 350 persons in a large room 60 feet by 30 feet. There are also two large classrooms at the side, separated by glazed partitions, each accommodating about forty persons; the partitions are removable, so that the space can be used on special occasions or when the congregations are so large as to require the increased accommodation. At the front of the building are two cloak-rooms, which will also be used as classrooms for the Sunday school. Provision is made in the structure for extensions by means of iron girders enabling the brickwork to be knocked out when further classrooms are erected. The building is constructed of brick with stone facings, and of suitable design. The cost, including furnishing, is about 1,800l. The architect is Mr. J. B. Thornley, of Derby, and the contractor Mr. James Cooper, of Rotherham. The site embraces 2,088 yards of land, one-third of which is being utilised for the school premises, and it is hoped in the near future to build on the remaining two-thirds a church for the requirements of a rapidly increasing populous district, at a probable cost of 3,000l.

#### BUILDERS' BENEVOLENT INSTITUTION.

THE indefatigable committee of the Builders' Benevolent Institution may well be proud of the result of their labours for the weal of those in whose interest the Institution may be said to exist, for at the election which took place on Monday last

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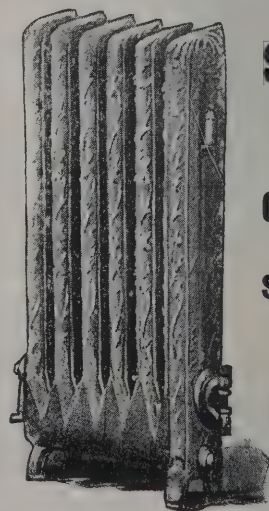
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they were in the happy position of being able to elect all the candidates for the pension who were eligible to receive it. Such a satisfactory condition of things should largely stimulate the inflow of subscriptions, which are much needed for the extension of the beneficent aid afforded by the Institution.

## THE BRITISH SANITARY COMPANY'S NEW AND IMPROVED EARTH CLOSET.

THE advantages of the earth closet in rural districts or lonely situations are sufficiently obvious, but one disadvantage appertaining to those hitherto brought into requisition is that the earth used must be not only in a state of fine division, but perfectly dry, which is not easily attainable nor wholly free from objection on the score of dust arising when in use. In order to get over the difficulty, and to induce the more general adoption of the dry earth closet, the British Sanitary Company, of Bothwell Street, Glasgow, introduce their new and improved earth closet to architects, builders, sanitary engineers and the public generally, as the most perfect appliance of the kind in existence. The advantages thereof are thus summarised:—

1. The simplicity, strength and perfection of the mechanism. The mechanism being bushed with brass, it cannot corrode or get out of order.

2. The effective distribution of the deodorising material thoroughly covers and absorbs all offensive matter and smells.

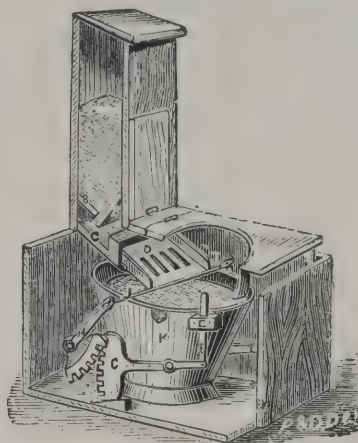
3. The large capacity of the containing magazine holding the earth or other deodorising material, providing for fifty charges

4. The very moderate price it can be sold at as compared with other closets not possessing the above advantages.

It may be mentioned also that there is no valve to clog and get out of order, as in other closets, while the perforated shovel acts as a spreader, thus insuring certain action and equal distribution of the deodorant.

The various awards from sanitary and other exhibitions testify that the closet is based on sound and scientific principles, while the fact that large numbers are in daily use on the estates of numerous noblemen and gentlemen, as well as in public institutions, works, railways, lighthouses, steamships, &c., affords abundant evidence that the appliance is one that may be relied upon and is already much appreciated.

A reference to the illustration will explain the nature and working of this closet. A is a magazine for containing the dry earth or other deodorising material used. B and B' are the sustaining pieces to bear up the weight of the material, and also form the regulating orifice. C is a bevelled shelf which is lined with a metallic plate, and carries in front an iron frame or mouthpiece through which the perforated shovel or spreader



D travels. The action is communicated as follows:—When the closet is being used the seat is depressed about an inch, forcing down the rods EE on each side of the seat, which raise the long and weighted end of the segmental toothed levers G and G, which in turn throw back the long end of the lever H. This duplex action is coupled by the cross bar J, to which is attached the shovel D. This is then withdrawn to the back of the bevelled shelf C, and receives the charge of earth, &c. When the seat is relieved the weight of the lever brings out the shovel quickly, thus spreading the earth, &c., over the excreta.

## INSTITUTION OF ELECTRICAL ENGINEERS.

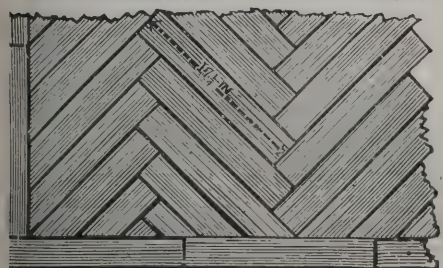
THE annual dinner of the Institution of Electrical Engineers took place on the 17th inst. at the Hotel Cecil, Mr. James Swinburne presiding.

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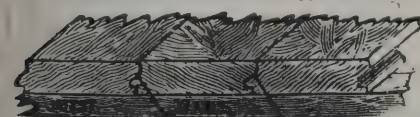
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Mr. J. Balfour-Browne proposed "The Institution of Electrical Engineers."

The President, who replied, said that the engineers had secured a permanent civilisation to the world. Had the engineers of the old world not only been that but priests, the people of the earth would have been greatly more advanced than at present. He suggested that the really important affairs of the world should be governed by engineers.

Mr. Robert Hammond proposed "The Law."

Lord Justice Cozens-Hardy, in response, said that Parliament had made them free of the Crown and the Executive, but their real strength lay in the confidence of their fellow citizens. He trusted he might be pardoned if he confessed that they sometimes suffered at the hands of the scientist, and he suggested that at times the length of patent cases might be reduced.

### MADRAS HARBOUR.

IN May last the Secretary of State for India appointed a committee of experts, consisting of Mr. C. S. Nares, Mr. C. A. Hartley and Mr. W. Matthews, to report whether the proposals which had been submitted to his lordship for the improvement of Madras harbour, and to prevent, if possible, the existing liability to serious damage from cyclones "are generally feasible and suitable in the conditions of the harbour including the progressive accumulation of sand to the south of it." The full terms of the report of the committee have now been published by the *Madras Mail*. The scheme submitted provided for the opening of a new north entrance and the closing thereafter of the existing eastern entrance, the new entrance to be 400 feet in width and to be protected seaward by the construction of a breakwater arm, 1,600 feet in length, commencing at the outer portion of the curve in the existing north pier and extending therefrom in a direction practically parallel with the shore line. It was further proposed that the centre of the new north entrance should be placed at a distance of 820 feet shoreward of the inner face of the protecting arm. The project was framed by Mr. de Winton, the chief engineer to the Madras Government, who estimated the cost at 196,667*l*. The committee pronounce unhesitatingly in favour of the principle of the proposal, being of opinion that whilst the eastern entrance remains open the harbour must unquestionably be deficient in shelter, and on the occasion of

cyclones might even be dangerous to vessels lying within its area. They consider that there is no satisfactory mode by which the existing entrance can be effectively or sufficiently protected, either by a sheltering arm in connection with the south pier or by isolated moles or otherwise, without at the same time creating such difficulties with regard to the navigation of the entrance and other matters as would render the adoption of such expedients altogether inadmissible. Difficulties will have to be encountered in carrying out the scheme, but the committee see no other effective method of dealing with the local conditions of the site, including that of the growth of sand and its inevitable travel northwards. Subject to certain modifications on points of detail and not affecting the principle of the scheme, the committee recommend its adoption, and believe that if the works are effectively carried out the harbour will be rendered sufficiently quiet for the safe and convenient berthing of vessels under all conditions of weather.

### SCOTTISH MUNICIPAL ENGINEERS.

THE half-yearly meeting of the Scottish Association of Municipal Engineers and Surveyors was held in the Burgh Court Hall, Glasgow, on the 13th inst., Mr. A. B. McDonald, city engineer, Glasgow, the president, in the chair.

Lord Provost Primrose welcomed the members on behalf of the Corporation. He understood that the Association was quite in its youth yet, only having been founded about a year ago on similar lines to a parallel institution in England. He believed he was correctly informed when he said there was some desire that they should have amalgamated and made one national association. He saw from the agenda that a paper was to be submitted on "Viagraph Tests of Street Paving." He thought at first it might be some new departure in street paving. On inquiry, however, he found it was only a machine that was drawn along the roads and automatically registered inequalities. It suggested to his mind one matter to which engineers and surveyors might profitably direct their attention, the paving of great cities; for nothing more awful than the noise of Glasgow was to his mind conceivable. Calm reflection was very difficult when traversing the streets, and even when they were inside their offices and business chambers the noise passed through all obstructions of stone and lime and glass, and they had often

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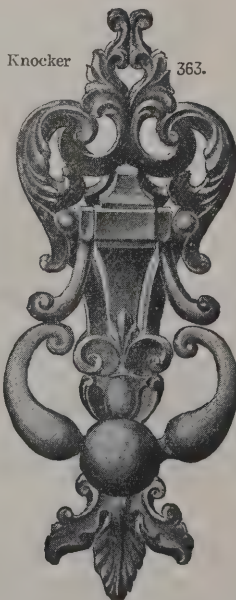
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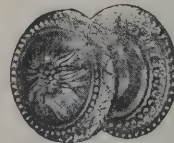
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within their chambers on leading thoroughfares a very inferno of noise. That some profitable work might be done in that direction he earnestly trusted. They must admit that in London conditions were very much better; notwithstanding the enormous traffic there was something like decent quiet even in the heart of the City where traffic was heaviest. He could not conceive that it was beyond the ability of engineers to ultimately effect a reform in our city. If this were brought about it would be hailed with gladness by every citizen. He trusted that the intercourse of the members would be profitable to themselves, and by reflex action influence profitably the communities represented.

Baillie Stevenson, as senior magistrate, supplemented the welcome of the Lord Provost.

The President said that the Lord Provost and his magisterial colleagues were obliged to go away to attend a meeting which had been arranged some time ago. He thought that it would be improper if they were allowed to depart without the thanks of the Association being accorded them for their kindly welcome. He moved accordingly.

The resolution was cordially approved.

The meeting unanimously adopted an alteration in the constitution as follows:—"Admission as members may be extended to principal assistants not under twenty-five years of age, and having special qualifications."

Mr. Thomas Aitken, county surveyor, Cupar Fife, read a paper on "Viagraph Tests of Street Paving." He explained that the viagraph is an instrument designed to give autographic records of the unevenness of paved streets and macadamised roads. Originally the intention was to apply it to macadamised roads only in order to compare what was considered the unsatisfactory state of the roads in Ireland with those in Great Britain. But it had been made suitable for all classes of roads. A length of 88 yards, 1-20th of a mile, was convenient, and was measured off automatically in using the instrument by apparatus inside the profile drum round which the paper passed from the stock roll to the receiving drum. The machine could be used as a sledge or slider, and also had a serrated wheel which rose or fell to correspond with the unevenness of the road. The best result attained in asphaltic pavements so far tested was in Cochrane Street, Glasgow, formed of seyssell, and laid in August 1902, the surface giving 6.7 feet of unevenness per slider per mile. In Wilson Street, Glasgow (Alcatraz, 1899), from Brunswick Street, going westwards, the record was 11.3 feet; in Brunswick Street

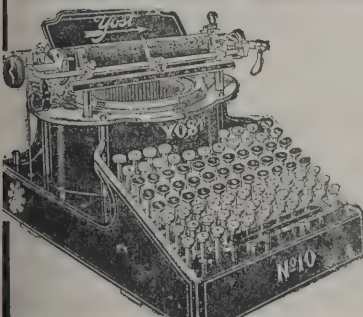
(Limmer, October 1902), from Ingram Street, going southwards, 13.25 feet; while in George Square (Alcatraz, 1902), in front of the City Chambers, the unevenness amounted to 17.95 feet per mile. In wood-paving in Buchanan Street, Glasgow (March 1902), a piece of newly laid wood pavement gave a record of 19 feet, while in the same street on a similar pavement, but laid three years ago, the unevenness was found to be 31.1 feet. Sett-paved streets generally did not give, as might be expected, a good example of smooth surface. However, to make the comparison as complete as possible, several profiles had been taken in Glasgow. In Grove Street, which was paved with square whin in 1888, a portion gave a record of 36.0 feet with the slider and 43.6 with the wheel; while in Cedar Street, paved with whin setts in 1902, the unevenness was 53.7 with the slider and 98.0 with the wheel. In Wilson Street, from Brunswick Street towards Candleriggs Street, the result was comparatively high, varying from 10.41 of unevenness with the slider to 21.61 with the wheel.

The President explained that the examples given were not to be taken as a general index of the streets of Glasgow.

Mr. Turnbull, Greenock, said that the irregularities of roads had been regarded with considerable interest by different corporations, and it was therefore desirable that surveyors should have some convenient and easy method of testing the unevenness and comparing it with the traffic.

Mr. F. G. Holmes, Govan, thought that the instrument might be a most valuable one for corporations to have in certain instances. Speaking generally, however, he was a little doubtful of its utility, because when roads got into such a condition as to require radical repair that would be evident without the use of the viagraph. A good-going ward committee would be quite able to keep a surveyor up to his work. If, however, a machine could be invented which would give some idea of the life of a street or of the materials used in road-making it would be of great service. Streets in populous centres, such as Glasgow, Govan, Partick and all great engineering centres, were subject to enormous weights passing over them. They had been told that in Liverpool at the docks some of the paving materials took fifty years to wear an inch, but of course one could understand that in five years there might be as much in subsidence owing to the passage of heavy weights. He did not know there was a more reliable way of testing the life of material than by weighing the stones, as had been done in Liverpool.

Mr. John Bryce, Partick, thought that such a test as that

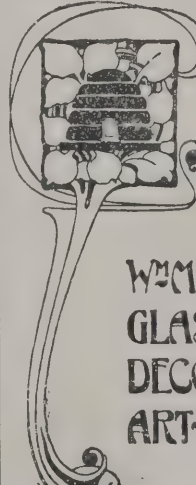


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of the viagraph could only be of use when it was read in conjunction with a record of the traffic. As good a way as any of testing the smoothness of a street was to ride rapidly over it on a bicycle. There was no doubt that the demand for smooth pavements arose from the awful noise of the streets. But seeing that rubber tyres were now being used for many classes of vehicles, the noise might in time largely disappear. There could not be anything better in the way of material than granite setts well grouted.

Mr. John Young, general manager Glasgow tramway department, did not know there would be much use to the machine until the streets were more perfect than at present.

Mr. James Murray, Paisley, considered that the machine would prove of great use in testing the irregularities of sewers, which could not at present be learned until perhaps something serious had happened.

The President said that when people talked of the noisiness of Glasgow streets as compared with those of London they forgot the different manner in which the horses were shod in the two places. If London horses were shod in the same way as the Glasgow horses, the short life of the wood paving would be such as to compel the authorities to adopt the same paving as in Glasgow.

Mr. Aitken was cordially thanked for his paper.

Mr. John Young, town surveyor, Ayr, read "Notes on the Design and Construction of Power Stations."

### PETROLEUM BRIQUETTES.

BRIQUETTES made with petroleum have been manufactured in various ways in different countries, notably in Russia, France and the United States, as a combustible for steamships and for certain industries where rapid production of heat is desirable. The advantages of such a substitute for coal are readily apparent—less storage room, complete combustion, &c. It is surprising, says Consul Brunot, of St. Etienne, that petroleum has not been utilised more generally in this form. The objections are that the briquettes injured the boilers after a short time by reason of some chemical action produced by combustion; further, the blocks did not keep their form under the action of the heat, but fell through the fire-box in a liquid state, and the price is said to be two-thirds more than that of coal. A company has recently been formed at St. Etienne for the manufacture of petroleum briquettes which

claims to have obviated all the objections except that in regard to price. The advantages of the product are set forth as follows:—The briquette is composed of 97 per cent. of petroleum and 3 per cent. of hydro-carbon. The volume being equal, it weighs only half as much as coal, and gives but from 2 to 3 per cent. of residue; it produces no slag; it does "run" when lighted, and keeps its form like coal; it burns without odour and without smoke; it may be wetted with impunity, losing none of its properties; it consumes without explosion or sparks, and yet with a bright and long flame; it may be kept indefinitely without deterioration. By this process a degree of saponification is obtained by which the briquettes are rendered unchangeable even to the extent that if a projectile should enter a ship's bunker filled with this fuel there would be no danger whatever of explosion, the effect being the same as in the case of ordinary coal. The average heating power is from 12,000 to 14,000 calories, and the briquettes can be employed in any fire-box or in any grate for domestic purposes. The manufacture of these briquettes is very simple, and requires but little machinery. If necessary, the petroleum contained therein can be recovered with a loss of only 5 to 7 per cent. The same company manufactures what are called mixed briquettes—half coal and half petroleum; but if these are cheaper than the former they present less advantages from the fact that the density is greater and the heating power is only 9,000 calories. A steamer carrying 8,000 tons of coal would require 3,500 tons of mixed briquettes, and only 2,500 of the pure petroleum briquettes.

### THE COTTANCIN SYSTEM OF REINFORCED CONSTRUCTION.

THE ceremony of laying the commemoration-stones of the new Wesleyan church of St. Sidwell's, at Exeter, on December 3, has drawn considerable attention to the interesting system of construction being employed for the first time in England in the building of this church. This system, which is well known and largely employed in France, but has only recently attracted attention in England, is called the Cottancin system of steel-cored brick and steel-cored cement construction. This system, which has the advantage of being absolutely fireproof, for the steel core employed is so small that even great heat has no effect on it when embedded in cement, and no dislocation

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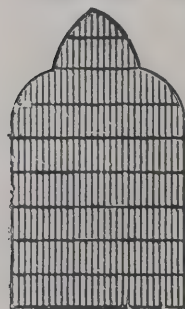
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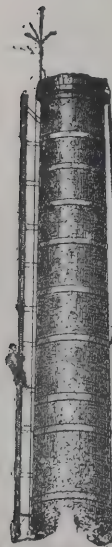
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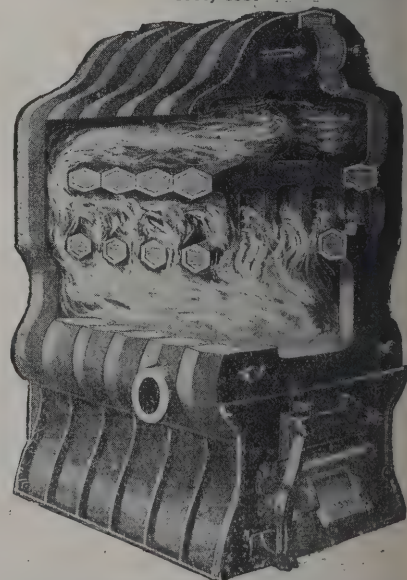
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can occur as is the case when steel elements of larger diameter are employed, is also very advantageous in point of view of economy in cost of construction, solidity and durability, adaptability to the many problems of modern building construction, the suppression of numerous points of support and consequent economy in space, and the entire suppression of all timber for construction of floors and roofs.

The interesting points in the construction of the above church are the steel-cored brick caisson foundations, the steel-cored brick hollow walls, the reinforced cement gallery and the important octagonal dome with lantern and cupola above. The foundations and lower portion of the building already completed have been constructed of steel-cored brick caissons, the foundations of this system, about 3 feet deep only, replacing the ordinary deep foundations of concrete with the usual brick or masonry footings. The caisson foundations, largely employed in cases where the soil is soft or treacherous, are formed of a series of partitions of steel-cored brick 3 inches thick and about 3 feet deep, forming by their intersections one with another a number of large boxes of unequal dimensions and shape designed to meet the strains from the building above. These boxes, when completed to a certain level, are filled in with earth and covered entirely with panels of steel-cored cement about 2 inches thick, the trellis core of which is tied in a special manner to the steel wire cores projecting from the brick partitions. Such caisson foundations, which have been largely employed to carry very heavy buildings on soft soil, and even mud in several cases, are unable by the nature of their form to settle or slide in one or any portion, for the resistance afforded by the strong cement cover and the friction of the brick partitions against the earth counteracts any tendency to settle or slide. The economy in cost of foundations obtained by the employment of this system when the ground is soft is very great when compared with the cost of the deep masonry or concrete foundations necessary in such cases, often obliging excavation to very great depths against the 3 or 4 feet depth only required for these caisson foundations. In the case of the above church these caisson foundations were not employed for the sake of any economy to be obtained in the foundations themselves, but on account of the economy which could be obtained by their use in suppressing the expensive and heavy steelwork which would otherwise have been employed from ground to roof for supporting the wide gallery and domed roof and cupola. The walls of the church are being constructed of steel-cored brick in two thicknesses of 3 inches with air space

between, which will be utilised for heating and ventilation purposes, and have the advantage of keeping the interior cool in summer and making it easier to heat in winter. These steel-cored brick walls, as well as the partitions of the caisson foundations, are formed of a special hollow brick, through which pass vertical and horizontal cores of soft steel wire carefully embedded in the cement employed to fill the hollows of the bricks and the horizontal joints of the brickwork, and thus well protected from the influences of oxidation. The important gallery, 14 feet wide, which will go round six of the eight sides of the octagonal building, will be formed of steel-cored cement, supported by reinforcing ribs of steel-cored brick and steel-cored cement. This gallery will be suspended from the walls only, and will be entirely unsupported by any columns from below or tie-rods from above. The octagonal domed roof will be constructed of two thicknesses with air space between, the inner surface being formed of steel-cored brick and the outer surface exposed to the weather being formed of steel-cored cement finished in cement. The wide octagonal lantern, with root and cupola above, at a height of about 80 feet, will be constructed on the same system, all timber being suppressed in the construction of the roof as well as for the gallery and staircases leading from the gallery. No zinc or lead will be employed for the construction of the gutters, flashings or flats; all these will be formed of cement and will afford a considerable economy in the maintenance of the roof. The steel core, which passes without discontinuity from the foundations through the walls, gallery, floors, roof and lantern, will form a whole of extraordinary strength and resistance. This system is largely employed in France for the construction of all kinds of buildings, from works and factories to châteaux, churches, theatres, country houses and street houses. One of the latest buildings entirely constructed on this system is that of the seven-storey house in the Avenue Rapp, Paris, which received this year the premium awarded by the Paris Municipality, and has been illustrated in several of the English journals. The architects of the church at Exeter are Messrs. Fred. J. Commin & Walter Coles, of Exeter; the system of construction has been accepted and passed by the streets committee on the report of Mr. Thomas Moulding, C.E., city surveyor, and approved by the City Council. The whole work of construction is being undertaken by the Cottancin Construction Company and the labour employed is entirely local under an experienced foreman. The cost of the constructional portion of the work will be 3,000

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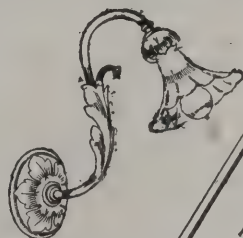
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### PRODUCTION OF IRON IN AMERICA.

A PAPER was read at the second meeting of the session in connection with the Staffordshire Iron and Steel Institute by Professor Turner, of Birmingham University and a former president of the Institute, entitled "Some Notes on a Visit to Pennsylvania in the Summer of 1902." Professor Turner at the outset referred to the important extensions in progress in connection with the University of Birmingham, and remarked that it was intended that shortly there would be in working operation a metallurgical department on a more complete scale than had hitherto been attempted in this country. In connection with the preparation of the plans for this part of the work Professor Redmayne and he visited certain representative universities and technical schools in Canada and the United States. The visit was necessarily brief, but the opportunity was taken by Professor Redmayne to visit certain representative mining operations, while he (Professor Turner) visited works in which electro-metallurgical and refining processes were conducted, and also spent a short time in Michigan and Western Pennsylvania. So much had been heard from time to time of the extreme purity and easy reducibility of American ores that it might be well to point out that ores of equal purity were to be obtained in this country, and ores, too, which could be quite as easily smelted in the blast furnace. The important questions, when comparing the two countries, were less those of quality than of quantity and distance, and we were apt to attach too much importance at times to the immense mineral resources of the United States and too little to the energy, industry, perseverance and skill of the people. With the development of the bituminous coalfield of Western Pennsylvania and the opening up of the iron-ore regions of Lake Superior during the last quarter of the nineteenth century it had been seen that ready and cheap transport was of greater importance than contiguity of supplies. The enormous quantities of material which were available allowed the question of transport to be dealt with in a comprehensive and masterly way, which again reacted on the size, capacity and output of the works in such a manner that a modern ironworks became a centre to which were collected materials of all kinds, assembled from far-distant localities, and at which were to be seen examples of the best engineering practice of the day. It was in this way that the at one time apparently insuperable difficulty of distance led to an enormous expansion of the iron trade in Pennsylvania, and to the erection of immense plants which

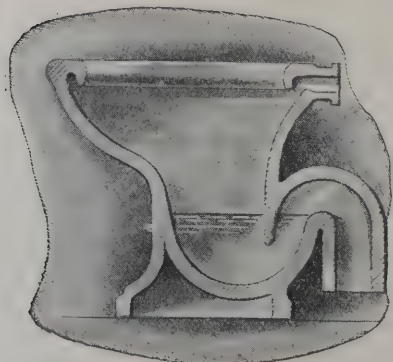
had served as models in many important respects for the whole world. In round figures, something like four-fifths of the iron ore raised in the United States was obtained from the Lake Superior region. The ore was deposited by the steam-shovels at the mines in huge hopper cars, and was conveyed by special locomotives to lake steamers, on which it passed through Lake Huron to Lake Erie, and was unloaded at Cleveland or other ports on the south side of the lake. The ore was then transferred to hopper cars, which travelled by special freight lines to their destination. It was claimed that more tonnage now passed Detroit than crossed the Atlantic Ocean. The loaded car was run on to a balanced frame, on which it was gripped, while the frame moved through the arc of a circle, and the whole car was bodily emptied. Where this tipping apparatus was not employed double hopper cars were used, and one man could empty four cars, or about 200 tons of ore, per day of twenty-four hours. A train of these cars conveyed from 2,500 to 3,000 tons of ore in the usual course, and the cars generally conveyed coal back to the lake ports. Professor Turner proceeded to give some description of the works of Homestead, Duquesne and Edgar-Thompson, belonging to the Carnegie Company. The average coke consumption at the Edgar-Thompson blast-furnace plant was about 1,900 lbs. per ton of pig-iron produced, but with good coke and best working a ton of pig-iron was produced with about 1,750 lbs. of coke. Careful records were kept of the production and coke consumption of each furnace, and these records were circulated among the managers of the various plants, and no doubt this stimulated healthy competition. The largest recorded monthly output of a single furnace to date was made in May 1902 by the Edgar-Thompson E furnace, the produce being no less than 20,188 tons. Looking back on the impressions of his brief visit, three things appeared to Professor Turner to be worthy of special remark. Of these, first and most interesting was the people. It was true that in the manufacturing centres of America there were to be found a large proportion of negroes, Italians and Hungarians, not to mention those of Teutonic or British extraction; but, speaking generally, the leading positions were occupied by men who were American born, and those of other races, in the first place at all events, were merely day labourers. Those who were really responsible for the conduct of these vast enterprises were usually thin, lithe, active, keen, clean-shaven, young-looking men, who worked twelve hours a day six days a week, who took little alcohol, but often consumed a good deal of tobacco,

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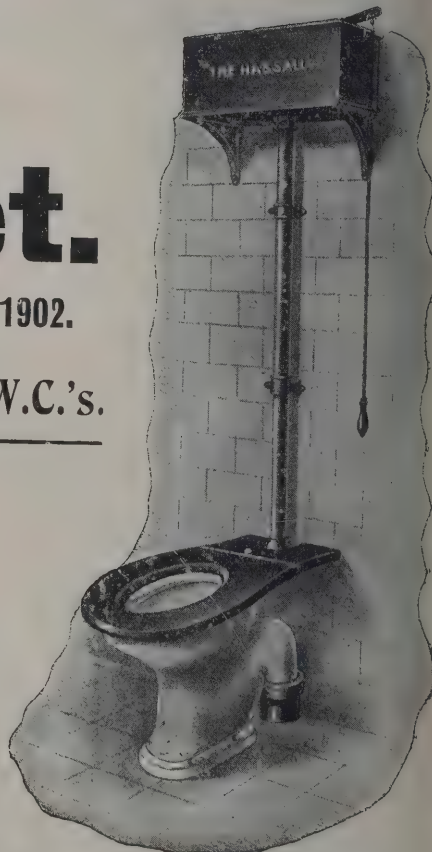
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who always had an eye to the main end in view, who led "the strenuous life," and yet who had always a frank and courteous reception for a stranger. But perhaps nothing about them was more striking than their buoyant self-confidence, which was based upon their acknowledged success in the past, and which was, after all, the best guarantee of success in the future. Secondly, distance exerted a most important influence. If the United States be compared, area for area, with other parts of the world it was doubtful whether the provisions of nature were any more bountiful on one side of the Atlantic than the other. The difference appeared to be that in America we had to deal with a comparatively new country, where the national resources were being exploited as rapidly in one year as in ten years in an older land. The difficulty of transport having been once overcome, the mineral resources of immense areas were rendered available, so the furnaces were no longer restricted for their raw materials to the products of a particular district or confined in their markets to a local area. It thus became possible to plan works on a scale limited merely by the capital available, and to adopt mechanical contrivances and economies which would be impossible by less gigantic undertakings. Distance had thus almost ceased to be a disadvantage, but acted beneficially in increasing the total volume of trade and in diminishing the natural fluctuations of the market. Finally, the educational system of Canada and the United States called for remark. Faith in the utility and necessity of education was firmly fixed in the American people. Wealthy citizens were prepared to subscribe with more than princely liberality to the cause, parents were willing to make heavy sacrifices so that their children might be taught, whilst the students themselves were in many cases so enthusiastic that they were prepared to live during the session on the money they were able to earn during the vacation, rather than enter upon their life's work ill prepared. Hence our system of evening-class work found little favour in America, students passing through the primary and secondary schools to the college or university, where four years' were spent in strenuous work. The result was that the students in applied science at the higher centres of learning were numbered by the hundreds at each university, while the course of work was so systematic and thorough that manufacturers recognised that the men thus trained were the best they could obtain in order to direct the most important industrial undertakings, and students who had graduated experienced no difficulty in obtaining suitable employment.

Until a similar condition of affairs existed in this country it could not be suggested that the need of higher technical training had been satisfactorily met.

### EDINBURGH AND LEITH MASTER BUILDERS' DINNER.

THE annual dinner in connection with the Edinburgh and Leith Master Builders' Association took place on the 11th inst. in the Royal British Hotel, Princes Street, Edinburgh. About 130 gentlemen were present. Mr. Robert Lamb, president of the Association, occupied the chair, and Messrs. Knox and M'Leod and Councillor Forrest acted as croupiers. The loyal toasts were proposed from the chair, and enthusiastically pledged.

Mr. Patrick Knox, in proposing "The Imperial Forces," expressed surprise that at this time of day it had been necessary to conduct a bazaar to raise funds for the accommodation of one of their Volunteer brigades. It ought to lie with the War Office to provide all that was necessary to make the Volunteers better soldiers.

Treasurer Cranston, in replying, agreed with Mr. Knox in regard to bazaars. He did not believe in them, but in the instance mentioned he had loyally to fall in with the majority. He quoted Lord Rosebery, to the effect that this country went blundering into wars, but always came out right. That was true, but whose was the fault? He did not blame the War Office, but rather successive Governments. There was plenty of raw material to make good soldiers of, but Governments had failed to adapt their system to the increasing needs of the Empire. While people might grumble at the taxes, they paid all the same. He held that under present methods the country only got sixpence for every shilling they spent on the military forces. There was plenty of capital and plenty of patriotism in the country, but if they were to take full advantage of these factors they must reform their machinery.

Mr. James Millar, in proposing "The Lord Provost, Magistrates and Town Councils of Edinburgh and Leith," suggested that the Corporation might undertake the erection of working-class houses, and thus do something to relieve the distress in the building trades. His opinion was that no private individual could build houses for that class of people under the present conditions of the building rules. He also suggested that on inquiries into the housing question evidence

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should be taken from builders, architects or house factors, as well as from other experts.

Bailie Bryson, who acknowledged the toast, said that the Town Council of Leith had appointed a committee to deal with the tramway question, and he had no doubt that from the friendly relations which existed between Edinburgh and Leith some way would be found out of the "Pilrig muddle." He was opposed to corporations taxing one class of the population for the housing of another class.

Councillor Dobie, who also replied to the toast, said that if they believed the man in the street and anonymous letter-writers they could come to no other conclusion than that the members of the Town Council were mostly fools. Although the ratepayers were sometimes unwise enough to send a round man to fill a square hole, the majority of the town councillors were men of common sense. In regard to Mr. Millar's remarks as to the building of working-class houses, he said it was matter for consideration whether the proposed cheap electrical transit to the districts surrounding the city might not materially assist the erection of cheap working-class houses. If the proposed electrical tramways were laid, some experiment might be made in the housing question.

Mr. A. Hunter Crawford proposed "The Edinburgh and Leith Master Builders' Association." Speaking of the Dean of Guild Court regulations, he said he would like to hearten the civic authorities in their efforts to get good work put up in Edinburgh. The excellent quality of the building work in Edinburgh had been largely helped by the building regulations. Under these regulations there was in Edinburgh greater freedom in carrying out work than was to be found in other cities. Convener Barton replied.

Mr. James Hall proposed "The Scottish Building Trades Federation." He thought there was no present necessity for working-men's houses. There were 2,581 empty houses in Edinburgh this year, or 350 more than were empty last year. Did that show that more houses were wanted for the poor people? There were empty houses with rents as low as 6%, and there were 1,100 empty houses rented at between 10% and 12%. In the West Port and Tron Square the Corporation had built houses, the tenants in which had come complaining to him that they would not stay in them—they were so cold. If the bricks had been pressed, it would not have been so bad, but they were bricks with irregularities that crows could build their nests in.

Councillor Forrest, who replied, agreed with Mr. Hall that

the demand for workmen's houses was not so great as some people would like to make out. He remarked that the Building Trades Federation had not been taken up so enthusiastically as was to be desired, and he urged that everybody connected with the building trade should come into the combination.

Lord Dean of Guild Bruce proposed "The Architects and Surveyors." He said that the Scottish style of building impressed one too much with its stability and solidity. That was all very well in its way, but he would like to see less of solidity and more of beauty in their elevations. The architects who most succeeded in that respect were sure to be the most successful in their profession. Speaking of Princes Street, he said that the height of the buildings in that street formed one of its attractions, and he hoped that where buildings there required to be heightened it would be done at no distant date. In regard to the Usher Hall—the site for which he thought was the best possible—he trusted that the Town Council would arrange for competitive plans being asked for, so that rising architects might have an opportunity of sending in plans. If that were done, he was sure they would see erected a building that would be an ornament to the city, and a worthy memorial of the generous donor—Mr. Usher.

Mr. Lorne Campbell, in reply, said that architects had not in every case made the best of their opportunities in regard to the æsthetics of the buildings they designed. The Dean of Guild Court had no control over that matter, and he did not know that it would be wise to give the court that control. Most of the architects of Edinburgh were at one with the Lord Dean of Guild as to the propriety of asking competitive plans for the Usher Hall. He thought it would be a slight to the architects of Edinburgh if the designing of the Usher Hall were kept in a city department. A public-spirited man like Mr. Usher would have desired that his scheme should have been carried out in a public-spirited way, and the only way of doing that was to give all the architects of Edinburgh, or the whole of the architects of the kingdom if they liked, a chance of preparing plans for the hall. Edinburgh had a very unenviable reputation in regard to such competitions. On several occasions premiums had been paid for designs and the work had not been proceeded with. The building of the Usher Hall provided an opportunity for Edinburgh redeeming itself in the eyes of architects.

Mr. A. K. Smith replied for the surveyors. Other toasts followed.

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# The Architect.

## THE WEEK.

PROFESSOR BOYD-DAWKINS has done useful pioneer's work in endeavouring to clear away the obstacles to our knowledge of early man in Britain. As a practical geologist and palæontologist he might be supposed to be in favour of museums on the grandest scale, and on those only. But last week he delivered a lecture to the members of the Powysland Club, which by itself is enough to show how enthusiastic he is about local museums. At one time, he said, a museum was looked upon as a receptacle for odds and ends of all kinds—such as pickled babies, a five-legged sheep, or a portrait of an alderman which the family did not care to keep in the house. A more worthy notion now prevails, and before long it may be taken for granted that museums will hold an important place in the educational system of England. The obtaining of the objects that were desirable would be impossible without an expenditure of money, and Professor BOYD-DAWKINS declared that it was as much a duty to lay out money on museums as on Board schools. Few who have studied the subject will venture to disagree with the Professor. Looking at the heterogeneous things to be seen in museums, it might easily be imagined that the original English museum was the apothecary's shop which was to be found in London and elsewhere, as well as in Mantua. The hanging tortoise, the stuffed alligator, the skins of ill-shaped fishes have not entirely departed from our institutions. Such things may still have their educational use, but what is more desirable are objects which illustrate local life in past ages, and it may be examples which will help to suggest the exact position of local industries in the European scale.

THE "octroi duties" at the barriers of Paris are now levied very rigorously. This is demonstrated by the increase of this year's returns over those of last year. From January to November the amount has been 95,965,505 francs, against 93,781,677 francs for the corresponding period of 1901. The position of building in comparison with other industries is suggested by the amount for the eleven months derived from the materials employed in construction. The sum was 8,515,919 francs, which was an increase of 947,080 francs over the receipts for a like period last year. About one-twelfth of the octroi duties has, therefore, been levied out of building materials. Owing to the works undertaken during the last forty years in widening streets, building schools, &c., in Paris, the expenditure is now between 13 and 14 millions sterling a year; about one-half of that is derived from octroi duties.

THE Lord Chancellor does not preside in many Courts, and from his own experience cannot be regarded as an authority on their defects. The remarks which were made by his lordship on Saturday at the luncheon which followed the laying of the foundation-stone of the new Sessions House of the Old Bailey must therefore be taken as expressing the conclusions of other judges. They are no less important on that account. His lordship said that in his long experience it had appeared to him that one of the last things that the architect seemed to consider was how people were to hear what was said. The architect was told that he had to make a place for the judge, another for the jury and the witnesses, and so forth, and with great skill and geometrical precision he mapped out all these things; but their relations to each other, whether the witnesses could be heard by the jury, or the jury by the judge, and so on, were things which in a great many Courts never seemed to have been considered. No doubt there had been an advance in acoustic science, as in other directions, and he felt sure that the City lands committee, consisting of so many practical men, would not allow such matters to be lost sight of in the new Court. It would be incorrect to treat the Lord Chancellor's statement as exaggerated. His words should be taken to heart by all architects who have to design buildings in which a speaker has to address many people. But it can be said as some extenuation, that although the phenomena

of sound have received much attention from investigators, very few practical conclusions have been attained. Inclined walls and ceilings, the use of materials that are absorbent, low ceilings, floors laid out on isacoustic curves and the like may appear to be efficient in theory, but buildings arranged in absolute correspondence with those conclusions would be unattractive. Draperies, cushions, &c., which are sometimes found to be advantageous, and sometimes the reverse, are but slightly used in modern Courts. A thorough investigation of the subject is beyond the power of any individual. The Government might for the public benefit, apropos of the Lord Chancellor's observations, appoint a commission in which men of science, architects, theatrical managers, vocalists, actors and public speakers should have places.

ON May 16 we referred to a claim for 10,000*l.* which had been raised by the widow of the late JOHN COOPER, burgh engineer of Edinburgh, against the Corporation of that city for her husband's services as joint engineer for tramways. When Mr. COLAM was appointed he was informed that Mr. COOPER was to be joint engineer, and the commission was to be 5 per cent. on the outlay, which was 600,000*l.* Mr. COLAM drew 15,000*l.* as his share of the commission. It was calculated that after paying 5,000*l.* to Mr. COOPER's assistants, a sum of 10,000*l.* remained, for which the widow sued. Their liability was denied by the Corporation, and it was maintained that as Mr. COOPER was bound to devote his whole time to the duties of his office he was excluded from the performance of other work. Judgment in the case was not given until the 13th inst. Lord STORMONTH-DARLING decided in favour of the Corporation. He said that if the defendants had made such a contract as had been stated it would have been extraordinary and improvident. Mr. COOPER might have refused to share the responsibility for the tramways, although in the public interest it was expedient that he should be conjoined with Mr. COLAM. It was to be regretted that nothing was mentioned about an honorarium, which would have been very different from a commission. Mr. COOPER had never hinted to anyone until he was dying that there was a commission due to him from the Corporation, and he made no claim on the subject. He had accepted an addition of 100*l.* a year to his salary, and a gratuity of 200 guineas, neither of which would have been given if a sum of 10,000*l.* was lying to his credit. Lord STORMONTH-DARLING, in giving judgment for the defendants, expressed the hope that the Corporation would recognise Mr. COOPER's arduous and meritorious labour by awarding a substantial honorarium to his widow. When writing on the subject at the beginning of the litigation, we said that the case was likely to affect the position of municipal engineers. There is no doubt that officers should not be too sanguine about receiving extra remuneration when they undertake extra duties. It is only through a definite agreement in writing that any claims for extraordinary services can be recognised by the Courts.

THE report of the committee appointed in 1901 to consider how far the sections of iron and steel could be made uniform will shortly appear. It is, however, understood that a large reduction in the number of sections will be recommended. Instead of sixty-three sections of channel irons, twenty-three sections are considered to be adequate to meet the requirements of business. The angle irons of unequal sides can without loss be reduced from fifty-nine varieties to thirty. The reduction in beams will be less marked, as instead of forty-nine there will be thirty. No less than seventy-one sections of tram rails are in the market, while all practical needs can be served by five. Great Britain is remarkable for the vast numbers of sections which are rolled. For several of them there is only a limited demand, and it is doubtful in those cases whether the returns meet the cost of production. It is certain that Americans and Germans contrive to compete with this country by means of a limited number of sections, and the superabundance in Great Britain is not obtained without a large expenditure on rollers and tools. The members of the engineering standards committee represent not only producers but users of iron and steel.



## AN ANCIENT ALTAR.

AN assurance of their individual infallibility was one of the characteristics of the old race of archæologists. ARBUTHNOT did not exaggerate the weakness when he wrote his "Memoirs of Martinus Scriblerus." In it we read how the grave Dr. CORNELIUS believed he was possessed of an antique buckler, and in his dissertation concerning it he proved from the colour of the rust its exact chronology. That invaluable piece of antiquity had been purchased at the expense of all the family plate, but was cheap at the price, for it had become famous through the universities of Europe. All Germany was moved to inexpressible grief by its removal, and the great MELCHIOR INSIPIDUS broke his heart over the loss. An ignorant housemaid unfortunately scoured the shield, and in that way removed the beautiful obscurities which were the cause of much delightful disputation, where doubt and uncertainty went hand in hand, and eternally exercised the speculations of the learned. The shield, which was worthy to be the cradle of the Infant HERCULES, suddenly changed into a basin such as a country barber would not hang at his shop door, or, as others said, a paltry old sconce with the nozzle broken off.

After reading of the transformation of the wondrous shield of Dr. CORNELIUS, we might suppose the eighteenth-century antiquarians would display less assurance in describing the meaning of remains of antiquity. But among that class ridicule for once was ineffective. Indeed, we may say that at the present day, although the interest in the past is only of a very subdued kind, there is still extraordinary confidence by individuals in their own conclusions.

We present this week the outlines of an example of ancient art which at one time gave rise to dissertations, but all that is derived from them is a legacy of doubt about the purpose of the object, and the significance of the figures with which it is ornamented. It formed a part of the Borghese Collection, but as it belonged to the Monumenta Gabini which used to be found in the Villa Pinciana, there can be no hesitation about its genuineness as a relic of antiquity. It has been generally taken as an altar. Three kinds were recognised—square, or rather rectangular, round and triangular; the last form was seldom employed. Altars usually bore inscriptions stating the service to which they were devoted, but no clue of that kind is to be seen in the example under consideration. The diversity of character seen in the upper and lower rows of figures is also unusual. It is therefore not surprising that some archæologists have debated whether the work was a true altar and not a pedestal for some purpose in connection with the temple, or it may be the base of a candelabrum. Let us now consider the figures.

Schoolboys remember how "LARS PORSENA of Clusium, by the Nine Gods he swore, That the great house of TARQUIN should suffer wrong no more." The nine divinities were, according to PLINY, those who had had the privilege of employing the thunderbolt as a weapon. But the Etruscans and Romans believed they were in unity with the Greeks in accepting twelve Dii Consentes; in other words, there were superior and inferior deities. The former consisted of six male and six female representatives. At first sight it may not be evident that the upper row presents a god and a goddess alternately, but that is one of the difficulties which it is possible to explain. It must have been perceived at an early time that there was a liability to error in attempting to distinguish between figures which were as perfect in form as a sculptor or painter could make them; hence the introduction of various signs or symbols in order to facilitate identification.

On one face or side of the altar ZEUS or JOVE is recognised from carrying a thunderbolt in his hand. He is talking to or looking towards HERA or JUNO. The Empress of the Sky, the Great Matron of the Thunderer, holds a staff or sceptre, which is suggestive of the sharer of JUPITER's imperial sovereignty. But WINCKELMANN, who considers the altar an Etruscan work, says the figure is especially deserving of notice for another reason, which he thus explains. "She holds with both hands a pair of large tongs, and she was thus represented also by the Greeks. The figure is that of a JUNO MARTIALIS, a warlike JUNO; and the tongs probably contained an allusion to a particular manner of forming the order of battle to make an attack,

which was called *forceps*; and it was a saying, 'To fight like a pair of nippers,' *forcipe let serra proeliari*, when an army so opened in fighting as to enclose the enemy between, and was able to execute the same opening if, whilst engaged in fighting in front, it should be assailed in the rear." It would seem as if WINCKELMANN had fallen into an error and was thinking, not of the companion of ZEUS, but of a figure on another face of the altar, which is now generally accepted as a figure of VULCAN. It is evidently no mere oversight, for WINCKELMANN repeats the same interpretation in his "Monumenti Antichi Inediti." VISCONTI depends on the manifest relationship between each pair of figures as a safe proof of the two first figures being ZEUS and HERA:—"Non dubitiamo dunque che la compagna di GIOVE non sia la sua consorte e germana GIUNONE."



The trident carried by the next figure is sufficient indication of NEPTUNE or POSEIDON. If that instrument of authority were omitted, possibly there would be many speculations about the deity. The companion figure is CERES or DEMETER, "the gold-haired mother of life-strengthening seed." Her connection with NEPTUNE was not satisfactory unless the myth of ARION possessed a meaning for the ancients, which differed from what is derived from a literal reading of the words.

The first figure on the second side of the altar is the plated MARS, and, as pointed out by VISCONTI, it does not differ much from the god as depicted on a puteal in the Capitol of Rome. That the next figure is VENUS is not to be questioned, for the dove is employed as a symbol. WINCKELMANN was not, however, certain about the dove being a sure sign of the goddess, at least, in early art, and he imagined that one of the lower figures holding a flower might be VENUS. The caduceus and talia are sufficient signs to denote MERCURY to a modern student of mythology. But it is well to remember that the Etruscans as well as primitive Greeks were disposed to endow other gods and goddesses with small wings. In later examples of Classic art MERCURY is seen as a beardless youth. But the Pelasgians represented the god with a beard, and, according to PAUSANIAS, in the middle of the market-place at Phææ in Achaia was a bearded MERCURY. WINCKELMANN lays much emphasis on the form of the beard. It was, he says, of the kind known as a pantaloons' beard.



In the oldest Greek examples it also appears, and the epithet, if applied to it, does not signify a twisted beard, "barba intorta," but a wedge-shaped beard. The last figure of the row is assumed to be VESTA. In the arrange-

## II.



ment of the sides the figure of VESTA came next to ZEUS (on another face); and in that way the relationship of the two deities was suggested, for they were children of KRONOS and RHEA.

## III.



It would be excusable for anyone to suppose that the alternation of man and woman, or, as VISCONTI says, "d'una femminile e d'una virile," was disregarded by the sculptor of the third side, for the upper row seemingly

consists of goddesses. That, however, is not the case. The first figure that looks like DIANA revealing herself is APOLLO (the son of LETO, the goddess of darkness), but who was associated with light, and in this case appears to symbolise the removal of the last cloud which concealed his glory. As "MUSAGETES," or leader of the Muses, APOLLO was made to assume feminine robes by artists. There are some examples in the Townley Collection of the British Museum, which reveal the practice. One is seen in the *Apotheosis of Homer*. The bow carried by the goddess is enough to signify the arrow-loving queen, the virgin-huntress, the bow-bearing goddess DIANA, who was an especial favourite with Elizabethan writers; and if APOLLO stood for the sun and day, she represented the moon and night. But ARTEMIS seems to have been a far more powerful deity than LUNA. The third figure was the one accepted by WINCKELMANN as the martial JUNO, on account of the tenaglia, or pincers held by the figure. VISCONTI, relying mainly on the symbol, maintains the figure is VULCAN or HEPHÆSTOS. There were many legends about the deformity of the god, who had been cast from high Olympus. But we may well imagine that people like the Etruscans, who were great metal-workers, would be sometimes disposed to confer on him the fine figure and eternal youthfulness of other gods. He forms a worthy companion for PALLAS ATHENÉ or MINERVA, who was the goddess of the arts, the "Mechanitis" of Olympia.

The lower series of figures being on a larger scale may be suggestive of a nearer relationship to earth. On the first face are the Graces. There seems to have been no certainty about their number, although generally they were supposed to be three, viz. AGLAIA, EUPHROSYNÉ and THALIA. They are not entirely out of place on a slab with ZEUS, for according to one myth he was their parent. A modern sculptor like CANOVA or THORWALDSEN would consider it indispensable for the Graces to be nude, but the early artists took a different view of what was orderly.

The figures holding sceptres on the second slab were considered by VISCONTI as the Ilitia or representatives of the LUCINA of the Greeks, or as some thought of HERA or JUNO. HOMER, he says, describes them in the plural. In the eleventh book of the *Iliad* we hear of "the divine ILITHYÆ that rule the painful frame of human childbirth, the daughters of SATURNIA." VISCONTI goes further, for he suggests that the Ilitia were the Parcæ, although in more modern times it is customary to consider the latter as deciding the termination of human lives rather than the beginning. He finds some support for that conclusion in phrases by PINDAR and PAUSANIAS.

The lower range of figures on the third face of the altar are the Horæ or Seasons, who also could claim to be the daughters of ZEUS. We are so accustomed to four seasons, it may seem absurd to us that any ancient people could suppose there were only three. The Athenians were at one time satisfied with the belief in two seasons. Although there is a figure sometimes introduced in representations which may serve for Winter, that season had no official recognition. As in the upper row of the same slab gods appear like goddesses, it is not unlikely that only two Horæ are represented, and the third figure is that of VERTUMNUS, the spouse of POMONA, who was considered an influential power by ancient husbandmen.

While ancient art receives admiration, it will be necessary to consider the mythology to which it owed most of its inspiration. The myths may have been a popular means of expressing physical phenomena, and the whole cycle of legends relating to the Olympians is probably no more than a poetic effort to express the changes in the world by means of beings who corresponded in a great measure with humanity. But whatever may have been the inner meanings which were known to the initiated, the whole world of mythology vanished from the beginning of the era we are now celebrating. Then, as the great English poet writes:—

The lonely mountains o'er,  
And the resounding shore,  
A voice of weeping heard and loud lament;  
From haunted spring and dale,  
Edg'd with poplar pale,  
The parting genius is with sighing sent;  
With flower-enwoven tresses torn  
The nymphs in twilight shade of tangled thickets mourn.



## ITALIAN ARCHITECTURAL GARDENS.\*

THERE is no error in supposing that the love of the Italian garden in England is to a great extent owing to the influence of SHAKESPEARE. We know so little about the origin of the plays, it would be impossible to adduce any document which would be considered evidence in a legal sense testifying to the residence of the mysterious author in Italy. But the number of scenes which are supposed to be transacted in Italian gardens is remarkable, especially if compared with the practice of other Elizabethan dramatists. In "Romeo and Juliet" the essential part of the tragedy is enacted in the garden of the CAPULETS, and the failure of effect, which is not uncommon on the English stage, is owing to the circumstance that the imagination of the spectators is not satisfied with the confined area presented before their eyes. They wish for that largeness which if not always found in the gardens of Italy is cunningly suggested by artificial means. They seek also the glorious Italian sky which the scene-painter and the limelight man cannot combine to produce, and then there is the perfume which unfortunately is absent from all other gardens but those of Italy. The delightful scene in "The Merchant of Venice" when LORENZO and JESSICA recall old tales of love about TROILUS and CRESSIDA, DIDO and ÆNEAS, and so on, needs an Italian garden for its realisation. Elsewhere all those classic associations would be out of place. As SHENSTONE well remarks, "What an advantage must some Italian seats derive from the circumstance of being situate on ground mentioned in the Classics." But whether alluded to by any ancient author or not, all Italy is accepted by the inhabitants as classic ground, and for the purposes of poetry it is so.

In Italy it must be felt that nature is favourable to the creation of the kind of garden which is preferred by the people. In England, on the contrary, there are limitations which cannot be overcome. Flowers do not attain the size, colour and fragrance which are possible in Italy. The directions, for instance, which were given by BACON are suggestive of the restrictions which the climate imposes on English gardens. Fountains he considered desirable, but pools were, he said, unwholesome, and full of flies and frogs. Sculpture, whether in gilt, wood or marble, might be introduced in connection with gardens. But, as he said, "the main matter is so to convey the water as it never stays either in the bowls or in the cistern; that the water be never by rest discoloured, green or red, or the like, or gather any mossiness or putrefaction; besides that, it is to be cleansed every day by the hand." The Italian had no misgivings about slime and putrefaction; he realised his ideas in whatever way he pleased, and he trusted that nature would become subservient to him. His garden was no mere exercise in agriculture; it was rather a creation. LANDOR shrewdly remarks:—"We English talk of planting a garden; the modern Italians and the ancient Romans talk of building one," and he quotes a letter of CICERO, "Cui CNEUS noster locum ubi hortos edificaret daret."

No better word could be introduced than building, for if we study the plan of any of the great Italian gardens we can realise that the building, including, of course, combinations of architecture and sculpture, was first determined, and the trees, plants and flowers were arranged in such a way as to enhance the parts in stone and marble. Italy was more fortunate than other countries in having resources which enabled the creations to be completed. There was so general an aptitude among the population for the production of art that sculpture was obtainable at a cost which was not ruinous. So little work of the kind has been executed in England we have only one standard, and if a figure which stands in the open air has not the detail and finish required in a figure that is to sustain criticism in a gallery, little value is set upon it. But the Italians had garden sculpture as well as gallery sculpture; they had even statuettes only seen by intimate friends, and they were not afraid their taste would be disputed if sometimes in their gardens figures appeared which retained some of the characteristics of the unwrought material composing them. Such works served their immediate purpose; they

gave satisfaction to the owners, and the criticisms of foreigners at a future age were not taken into account.

The Americans, who appear to look on themselves as the heirs to all the ages, have not neglected to turn their attention to Italian gardens. The most comprehensive work in existence on the subject has just been produced in New York. It consists of about two hundred plates of large folio size, the majority being reproductions of photographs, the plans and views of former states being derived from old engravings. In them we have the most renowned of the architectural gardens of Italy. The series begins with the garden of the Villa Lante, Bagnaja, a fifteenth-century creation afterwards remodelled by VIGNOLA. In area it may be smaller than some of the others, but the fountains, terraces, as well as the residences occupy eighteen plates. The Villa Farnese, Caprarola, has a more famous garden. The caryatides are of immense size, the fountains are varied and quaint, and altogether the efforts of owners and architects were directed towards the attainment of originality. The Vatican gardens, although nearly entirely surrounded by great buildings, present a variety as well as a seclusiveness unequalled by any palace gardens of Europe. The French, who for a long time entered into rivalry with the Italians, have shown their respect for art by allowing the gardens of the Villa Médicis, in Rome, to remain unaltered. Both architecture and sculpture may show the effects of time, but it is felt that students of art will be able to realise the former aspect of the place, and although ground is required to increase the accommodation, the old arrangements are respected. The garden of the Villa Borghese is supposed to have been modified under the direction of MOORE, the Scottish painter, but it is known to all visitors to Rome as one of the most beautiful gardens in existence. It is now national property, but that will make no difference, for it has been practically a public garden. All lovers of art must earnestly wish that no craving for novelty or desire of change will be allowed to alter in the least degree grounds which are remarkable for many reasons. Another beautiful Roman garden is that of the Villa Bel Respiro, or Pamphilydoria. The principal building is in elegant style, with no more than a due proportion of sculpture. It stands on a higher level than the garden, and is approached by terraces that are among the best examples of that work. In the arrangements fine taste is everywhere visible.

The Villa Gerusti at Verona would form an excellent study for a painter of trees. In this case architecture was subservient. The Villa Borromeo, Isola Bella, was evidently laid out to afford as many coigns of vantage as possible for the enjoyment of the beautiful scenery. The elevation of many of the figures proclaimed that however high one ascended a reward was obtainable. The Boboli gardens in Florence are among the best known in Italy. The Pitti Palace has some of the sternness requisite in a Florentine mansion, but in the gardens there was no restraint, and beautiful sculpture as well as picturesque grounds rewarded the gaze of the visitor. The alley of oak trees is an example of Italian treatment without excessive coercion. The gardens of the Villa Castello are remarkable for the carving of rocks into animal forms. The Villa Petraja, the Villa Majano, the Villa Palmieri possess glorious gardens although of diminished area.

In the third volume we begin with the Villa Albani at Rome; the ancient palace now serves as a museum. The gardens were adorned with many structures, which were kept low. The gardens at the Villa d'Este, Tivoli, are evidence of genius in taking advantage of the picturesqueness of the site. Not only the style of architecture, but the trees have been carefully selected. Fine sculpture is observable, but there is much for which allowance must be claimed on account of their quaintness, such as fountains in the shapes of boats, of stone and vast masses of rock which suggest transformation into men. We have too some of the charming gardens of Frascati belonging to the villas Aldobrandini, Falconieri, Mondragone, Piccolomini and Conti. Views are also given of the Royal garden at Caserta, which is unique in the skill shown of the controlling of waters. Finally is shown the garden of the Capuchin convent of Amalfi, a subject which is often represented on canvas by foreign as well as Italian painters.

\* *Architectural Gardens of Italy: a Series of Photogravure Plates from Photographs made for and selected by A. Holland Forbes.* (New York: Forbes & Co., Ltd.)



The illustrations, as we have said, consist mainly of photographic plates. Evidently it was desired to impart to them some of the qualities of drawings, and the sharpness of detail has been subdued. But everyone glancing over the views can realise scenes in which art has combined with nature to create the beautiful. The work has appeared under restricted conditions. Only 750 copies will be printed, and the plates will then be destroyed. The price at first was 37.50 dols., or 7*l.* 15*s.*, but since November 1 the cost has been advanced to 50 dols. = 10*l.* 6*s.* As only a very limited number of the copies are available for this country, and believing that the matter would be one of interest to architects here, the B. and S. Folding Gate Company have made arrangements to secure from the publishers as many copies as can be spared for this country, and will be glad to supply them to architects at the original subscription price of 7*l.* 15*s.*, believing they will be interested in the work. The company are not acting in any sense as booksellers or book agents, but solely for the purpose of being of service to their customers in the architectural profession. This is a liberal offer which we hope will be promptly utilised, for the work will be found inspiring by all who enjoy Italian architecture.

### THE NATIONAL TRUST.

THE report of the Trust for Places of Historic Interest has been issued for the year 1901-02. During the year it has made by far its most important acquisition of property, the purchase of the Brandlehaw Estate, on Derwentwater, for 7,000*l.*, being on a larger scale than anything previously attempted. They also took part in the movement in connection with the enclosure of Stonehenge, the preservation of the view from Richmond Hill, and the preservation of Croxden Abbey, Launceston Castle, and the Bartlemas Hospital at Oxford, of which the domestic buildings belong to Oriel College, who have promised that they shall remain intact for the present. The balance on deposit and in hand amounts to 7,104*l.* The Council have issued an appeal for 400*l.* to secure nine acres on the summit of Kymin Hill, Monmouth. It contains the "Naval Temple" erected in 1800 in honour of the British Navy. When Lord Nelson visited this in 1802 he said that "it was not only one of the most beautiful places he had ever seen, but that, to the boast of Monmouth, the temple was the only one of the kind erected to the English Navy in the whole range of the kingdom." This monument is falling to decay, and it is hoped that the action of the Trust will secure its preservation. Canon Rawsley has written a leaflet dealing with the hill and the historic associations of the neighbourhood.

### THE NEW CENTRAL CRIMINAL COURT.

THE foundation-stone of the new Central Criminal Court, Old Bailey, was laid on Saturday afternoon by the Lord Mayor (Alderman Sir Marcus Samuel). In submitting to the City Lands Committee and their professional assessors his design for the proposed buildings, which we have already published, Mr. E. W. Mountford, the architect, states that the whole of the required accommodation has been provided. In the design generally impressiveness and dignity have been considered of primary importance and ornament has been sparingly used. By a system of mezzanine floors considerable height is allowed for the larger rooms and offices without the waste of space incurred by giving the same height to the smaller rooms. The various rooms and floors are thus also brought into closer connection with each other. On the principal (or first) floor the four Courts open upon a spacious central hall, to be approached by a grand staircase and surmounted by a dome. An important feature is the private corridor connecting the Court with the various retiring rooms for judges and juries, and the apartments of the Lord Mayor, Sheriffs, Recorder and Common Serjeant. A staircase leads from the corridor to the grand jury room below, giving convenient private access for the grand jury to the Courts and for the Recorder to the grand jury room. The police cells are in direct communication with the dock in each Court, and are also wholly shut off from those portions of the building to which the public have access. The Lord Mayor's suite of rooms is upon the principal floor, grouped together at the head of a spacious private staircase leading from the Lord Mayor's entrance, which is screened from the public streets by high gates. The offices for the clerk of the Court are upon the same floor. Upon the mezzanine floor beneath are the two rooms for the clerk of peace, and immediately beneath these, again, upon the ground floor, are the indictment office

and the rooms of the Public Prosecutor. All are closely united by their private staircase, communicating with a separate entrance from the Old Bailey and the record rooms in the basement. The public secondary staircase also affords ready access to any of these rooms. The principal entrance to the ground-floor is from the Old Bailey, and is 14 feet in width. The grand jury room is at the east end of the Newgate Street corridor, in the quietest part of the building. It is entered through the bailiff's room, and has a private stair leading to the Judges' corridor and Courts above. A private entrance for counsel, with staircase and passenger lift communicating with counsel's rooms upon second floor, is provided at the north-west corner. The Lord Mayor's entrance is upon the lower ground-floor. A broad and well-lighted staircase leads to the Lord Mayor's rooms above, and there is room for a passenger lift if thought desirable. Halfway up the staircase is a spacious landing, with fireplace, which might be used as a reception-hall or waiting-room. Two rooms for the police, with a room for the deposit of stolen property, are provided on the Old Bailey front; they have a separate entrance from the street, and communicate by the public secondary staircase with the upper floors. Upon the top floor is the robing room for counsel; it is approached by a staircase and passenger lift from the private entrance on the ground-floor. The various mess rooms adjoin one another and the serving room. The two kitchens adjoin and are practically one. The positions and arrangement of the various rooms have been carefully considered, and the lighting of the whole building has received much attention. The offices and rooms generally are arranged in groups in the most convenient manner. The judges' corridor and the Lord Mayor's suite of rooms are quite cut off from the public, and the prisoners from the time they enter the yard are completely isolated. In regard to the general construction of the building, the architect states that the walls will be built of brick, faced externally with Portland stone. The floors throughout will be fireproof, and the various staircases will be of stone. "The design generally is thoroughly English, as such an important building certainly should be, founded upon the work of Sir Christopher Wren and his pupils." The two large Courts are 35 feet high to the top of the main cornice, above which the dome rises an additional 5 feet. The two smaller Courts are 19 feet high to the cornice and 25 feet to the crown of the arched ceilings. The estimated cost of the buildings is given at 225,173*l.*, of which 179,049*l.* is for the main building and 16,124*l.* for the dome above the main building.

### CRETAN EXPLORATION.

A STATEMENT has just been issued of the work achieved by the Cretan Exploration Fund since the emancipation of the island in 1899 from Turkish control. The fund, of which the High Commissioner, Prince George of Greece, is the patron, has for the last three years been continuing the work begun long ago by Pashley and Spratt, and carried on since 1894 by Mr. Arthur Evans. The first appeal brought 500*l.*, and no time was lost. Early in 1900 Mr. Evans, having secured rights on the hill of Kephala, started operations at Knossos, and Mr. Hogarth, as the director of the British School of Archaeology, secured another site. Accounts have from time to time appeared in the *Times* of the magnificent palace disclosed by the labours of Mr. Evans. In the lower town of Knossos the excavations of Mr. Hogarth revealed a number of dwelling-houses of an even greater antiquity than the palace; and he conducted, in the joint service of the fund and the British School, a successful exploration of the Dictæan Cave, the legendary "Birthplace of Zeus." In the first instance a large proportion of the expense at Kephala fell on the explorer himself. French and Italian scholars can rely to some extent on the public purse where we have to appeal to public spirit. But this was not wanting, and a further sum of 2,500*l.* was subscribed. Thus in 1901 a substantial sum was available for Mr. Evans to supplement his own large outlay. Grants were also made to Mr. Hogarth and to Mr. Bosanquet, the new director of the British School at Athens, and work was simultaneously carried on at Knossos, Zakro, and Praesos, with brilliant results. At the last named an important discovery was made—an inscription cut in Greek letters of 400-300 B.C., but composed in a non-Hellenic language. A third appeal was issued in the autumn of last year; but, unfortunately, apart from the donations of the British Association, the Royal Institute of British Architects, and the Hellenic Society, the response was inadequate to the task. It thus became necessary in the present year to devote the whole income of the fund to Knossos. Even so, Mr. Evans has had to make up a deficiency of about 1,000*l.* on this year's work alone. The British School at Athens, however, has been able to devote a small sum to Crete, and Mr. Bosanquet has been successfully exploring the site of Palaeokastro, courteously resigned to the school by the German Archaeological Institute. The pro-



gramme for 1903 consists of two parts. It is proposed that of any fresh subscriptions which may be received, 200*l.* shall be set apart to continue the excavation of Palaeokastro and the search for the Temple of Dictæan Zeus, and that the remainder shall be applied to the work still to be done at Knossos, and, if possible, to the reduction of the burden which has fallen on Mr. Evans. The committee appeal earnestly for funds to enable them to carry out a forward policy in excavations which have already proved so fruitful. The magnitude of the labours at Knossos can be gauged by the fact that as many as 250 workmen were employed for most of the time between February 12 and the end of June 1901. The excavation at the south-east corner of the palace has still to be completed, and other works of delimitation must be carried out in other directions. Further research, too, is needed into the lower strata of the palace and the Neolithic deposit. In the plain of Palaeokastro—about three miles by two—there has been discovered the site of a Mycenaean town, extending over an area of 500 by 300 yards, and of cemeteries which throw new light on primitive burial customs. The largest of the houses which was examined lies inland in a group of what seemed to have been upper-class houses, constructed partly in the “Megalithic” style, like the Mycenaean homesteads in Crete, partly of regular ashlar masonry. This house anticipates in some respects the plan of Greek houses of classical times. An interesting account is also given of the results obtained in the cemeteries.

A fuller exposition of the work of the fund will appear in the forthcoming annual of the British School at Athens. The subscriptions for the year ended October 31 last amount to 1,817*l.*, and the hon. treasurers are Sir W. B. Richmond and Mr. George Macmillan. Mr. J. L. Myres is the hon. secretary. It should be added that the Royal Academy has assigned a room during the winter exhibition for the display of casts, photographs and drawings of the work accomplished.

#### SOCIETY OF ARTS.

THE Council of the Society of Arts, acting on the recommendation of the judges appointed by them—Sir William Preece, Mr. Robert Kaye Gray and Mr. Alexander Siemens—have awarded the prize of 50*l.*, together with a silver medal, offered for an essay on “Existing Laws, By-Laws and Regulations Relating to Protection from Fire, with Criticisms and Suggestions,” to Mr. T. Brice Phillips, sanitary inspector to the Uckfield Rural District Council, of 4 Aylesford Terrace, Uckfield, for the essay bearing the motto “Fiat Lux.” The Council have also awarded a prize of 10*l.*, with a bronze medal, to Mr. George H. Paul, for his essay bearing the motto “Ariston Metron”; and a similar prize to Mr. W. Craig Henderson, for his essay bearing the motto “Sola Virtus Nobilitat,” these two essays being considered to be equal in merit. They also consider the essay sent in by Captain Arthur W. C. Shean, bearing the motto “Fuego,” to be worthy of honourable mention. The judges reported that the essays were, on the whole, of a meritorious character, and, generally, of a high class. It is proposed that the prize essay should be read as a paper at one of the ordinary meetings of the Society of Arts. In all 12 essays were received in response to the offer.

#### CRYSTAL PALACE SCHOOL OF PRACTICAL ENGINEERING.

ON the 18th inst., Mr. W. H. Maw, president of the Institution of Mechanical Engineers, presided at the distribution of certificates to the students of this school. The reports of the examiners on the work done by the students during the past term were of a very satisfactory character. Mr. Francis G. Bloyd, who 22 years ago passed through the school himself, and who examined the students in the mechanical section, reported that the whole of their work had been carried out in a satisfactory manner. In the lecture examination several papers of marked ability were sent in, while in the drawing office, pattern shop, and fitting shop good work had been turned out, giving evidence of careful and practical instruction. Commenting upon his examination of the work performed by the civil engineering students, Mr. W. H. Holturn, the examiner for that section, said he noted the results of a carefully progressive course of training, carrying with it both the theory and practice in a manner within the grasp of the students. Mr. Arthur H. Allen, who examined the work done by the students in the electrical section of the school, reported that the results were highly satisfactory considering the short time the students had been under instruction. The progress made and the wide range of subjects covered were surprising and bore witness both to the industry of the students and to the excellence of the system of training. The Chairman gave an address to the students and afterwards distributed the certificates. Mr. J. W.

Wilson, the principal of the school, gave an interesting retrospect of its history, during the 30 years of its existence. Votes of thanks were accorded to the examiners and to the chairman, the latter of whom, in reply, said he could not speak too highly of the value of the work done at the school.

#### TESSERÆ.

##### Pierre Puget, the Sculptor.

AS to the date of Puget's birth, it is not quite positively known, but Bougerel, who was acquainted with Puget's grandson, says that he was born on the last day of October, 1622. The future sculptor appears to have been born in a place where he could pick up good potter's clay, with which it may be assumed that he played in his childhood, for any child in the least endowed with a faculty for modelling would amuse himself in that way if the material were ready to his hand. There is a tradition that Puget was one day found on his back watching an eagle in the air, and that he afterwards rudely modelled it, all which is not improbable. It appears that Puget's father, who is said to have been sculptor and architect, was simply a stonemason, and that his intention was to bring up his two eldest sons to his own handicraft. Pierre, who was the third son, became a boat-builder, and it is curious to trace how the things which surrounded him in infancy led to his subsequent career. It does not seem at first sight that a stonemason's son, in a seaside valley near Marseilles, is in the most promising condition for future development into a great sculptor; but it is probable that if there had been no clay at hand Puget would not have amused himself in modelling, and if he had been born in an inland valley he would not have become a shipbuilder. The connection between the shipbuilding (or rather the construction of galleys, for that was Puget's specialty as a young workman), the clay modelling, and his future career may soon be indicated. Now and then he was entrusted with the rude carving of a figurehead or an ornamented stern, and soon his master recognised Puget's superiority in this department, for where little science is called for, a strong natural gift makes its way without those long delays which are caused by the requirements of an elaborate training. Puget, however, was not satisfied with being a chief amongst rough workmen; he saw in the port of Marseilles the richly carved Italian galleys, and wanted to go to Italy, whither he betook himself at the early age of eighteen without finishing his apprenticeship. He went to Leghorn by sea, and thence straight to Florence, where he hoped to be able to earn his living. He took a lodging in an inn, where he left his clothes and his tools to get a little credit for his keep, as he had spent all his money in the passage from Marseilles. There was, however, a terrible and unforeseen difficulty—the masters at Florence would not employ him because he was a foreigner. At length, being reduced to the verge of despair, for he could not redeem his tools, he espied an old carver in a little shop making ornaments in wood, but he had no work for Puget. However, if he had no work to give, he had a heart to be touched, and left his work to take young Puget to the Grand Duke's carver, who allowed himself to be influenced by the old man's eloquence and sent Puget to his foreman. This foreman received the stranger contemptuously, and by way of derision set him to do a small panel. This he accomplished to the satisfaction of the master, and seeing workmen inferior to himself employed upon carved pedestals, he asked permission to execute one of his own invention. The result was so satisfactory that his master took Puget into his favour and lodged him in his own house, where, contrary to the usages of his country and class, he made him sit at the same table with the members of his own family. Puget's master did yet more for him by giving him a warm recommendation to a friend in the same trade in Rome, where he soon afterwards established himself.

##### Narni Cathedral.

The Duomo is a very curious building. The nave is basilican, separated from its aisles by arcading of nine arches, from monolithic columns with debased Attic bases and Corinthian capitals. The arches are segmental, but so flat as to be scarcely more than an entablature. Above the arcades is a clerestory of small round-headed lights, entirely blocked, and only visible from the exterior. This nave is vaulted in four bays of Roman vaulting, rising from horizontal strings. The aisles are similarly roofed with bays of intersecting cylindrical vaults. Eastward of the nave and aisles is a lantern-space covered with Roman vaulting in three bays, from north to south, and with modern extended transepts. The choir is of later Romanesque, an extremely broad five-sided apse raised over a crypt—as broad as the nave and aisles together. The altar, under a baldachin, faces east, and there are good stalls with pointed canopies. The apse is roofed with cellular vaulting, the ribs being plainly chamfered, and the vaulting-shafts being brought down to the ground, interpen-



trating through a projecting string-course, which is supported all round the inside walls on a series of corbel-brackets. The apse windows are all blocked. The crypt is quite modernised. There is an ambon against each pier of the nave arch. This arch, which is much loftier than the eastern arches of the aisles, is round-headed, its piers being banded with flowered capitals. An old vaulted chapel remains on the north side. Externally the north door has panelled jambs and half-figures of lions at the base, its doorway is square-headed under a segmental-headed tympanum. The tower is very fine, square and peculiarly massy; the belfry stage has three equal lights on a string and with connected hoods, a lower stage has two similar (but plainer) lights on each side.

### Pictures and Teaching.

The intellectual and moral conditions which affected the artist and public of the fourteenth century do not affect the artist and public now; if they exist at all it is in a profoundly modified form. In an age when books were rare, and when ignorance perhaps was even greater than at present, it might have been demanded of the artist, with some fair show of justice, that he should dedicate his chief powers to the promotion and diffusion of religious and useful knowledge; but now, when a cheap literature is accessible to all men, to make such a demand would be the exercise of an unnecessary and unreasonable tyranny. In the kingdom of art imagination is not the handmaid but the mistress of the understanding; and work which is not done for its own sake, in which the chief place is claimed for the historical or the moral, in which the attention is seized by the subject rather than by the rendering of the subject, in which the contents form the weightiest part, loses its æsthetic character, and cannot possess those poetic elements which fire the fancy and rouse the emotions. It is not inspired, it is not suggestive. "Suppose," says Springer, "that Raphael intended to depict in his *Disputa* and *Scuola d'Atene* systems of philosophy. Then before these, as before other didactic works, the fancy will remain unstimulated and the spectator will come before the picture with the question, What and whom do these groups, these single figures, represent?" In a truly artistically conceived composition the historical can form but the background; it must be developed and completed by the expression of the universal human element, freed from all accidents of time and place. Such work cannot be better described than in the words used by Burckhardt, in speaking of the *Incendio del Borgo*, from which the third stanza of the "Vatican" takes its name:—"Here we have purely artistic ideas carried into reality, free from historical or symbolical considerations in the dress of a heroic world. The artist must have been inspired by the present enjoyment of lively invention." The intelligent spectator must ask, before a truly poetic creation, not for the facts as they happened, or as he may imagine them to have happened, but for the train of thought, of fancy and feeling which they excited in the mind of an inspired man. The story is to the artist as the legend to the poet, between the lines of which he reads, letting the dead past suck out the life of his own soul, until it stands before him a new creation, and this process is not conscious. The great defect of the Quattrocentisti, regarded as artists, the great defect of all men who aim at "teaching," is that the view taken by them of their work is eminently subjective; instead of reflecting their subject, like a faithful mirror, they endeavour to force it into some preconceived shape then dominating their own mind. Work done in this temper can never claim the name of ideal, for it is always marred by individual bias or local colouring.

### Painters and Sculptors of Greece.

The statuary of Greece had no other advantage over its painters than that they used more durable materials; blessed with equal genius, formed by the same education, their arts went hand in hand to perfection. If Praxiteles be celebrated by Diodorus Siculus for having transfused into marble all the passions of the soul, the same power is attributed by Pliny to the pencil of Aristides. It is not probable that men of taste and letters, whilst they were eye-witnesses of the divine character in the Apollo, of the beauty and tenderness of the Venus, and the wonderful expression of the "Laocoon," should celebrate those very qualities in the works of their painters, were they not eminently possessed of them. Pliny in his description of that famous picture of the "Sacrifice of Iphigenia," by Timanthes, observes "that the painter having exhausted every image of grief in the bystanders and above all in the uncle, threw a veil over the face of the father, whose sorrow he was unable to express." If the ingenious Timanthes has left us to conceive an idea which he could not execute, Aristides, on the other hand, has executed that which is almost above conception; by him was painted "a town taken by storm, in which was seen an infant creeping to the breast of its mother, who, though expiring from her wounds, yet expresses an apprehension and fear lest the course of her milk

being stopped, the child should suck her blood." What a perfect knowledge of the human soul must this painter have had to enter thus feelingly into her inmost workings. What a power, next to creative, to make such tender movements sensible in the midst of tortures, and the mother's fondness distinguishable through the agonies of death? Let terror be united with pity, the muse of painting has completed her drama. Of this, the "Ajax" and "Medea" of Timomachus are beautiful examples.

### The Waits.

The wayghte, or wayte, was originally a minstrel watchman, and the kings of England, as well as the mayors of large corporate cities and towns, seem to have employed them in preference to common watchmen. By a document in Rymer's "Foedera," vol. ix, "De Minstriellis propter Solatium Regis providendis," it appears that in the reign of Edward IV. "a wayte that nightelye from Mychelmas to Shreve Thorsday pipethe the watche within this courte fower tymes, in the somere nyghtes three times, and makethe bon gayte at every chambere doare and office, as well as for feare of pyckeres and pillers; he eateth in the halle with the mynstrielles;" it then goes on to state his allowance of bread, ale, coals and so forth, for each night. By the same document it appears that there was a "yeoman-wayghte at the makinge of knyghtes of the Bathe," who, "for his attendance upon them by nyghte tyme, in watchinge in the chappelle, hathe to his fee all the watchinge clothing that the knight shall wear upon him." The waits seem to have been always distinct from the common watch, which was called the marching watch, and never, we believe, the waits. At a later period the term waits seems to have been restricted to the band of minstrels kept by the City of London and other large cities and towns. We read of the City waits frequently, from their attendance on the City pageants, and of the waits of Southwark and other places. In *The Tattler*, No. 222, a writer from Nottingham complains that the young men of fashion there "make love with the town music," and that "the waits often help him through his courtship." The waits, or stipendiary town-musicians, have for many years, we believe, ceased to exist in every corporate city and town in England.

### Westminster Abbey and St. Margaret's.

Very few people who see Westminster Abbey realise till they get inside that it is the loftiest church in England. Placed where it is in London and in such a part of London it cannot possibly soar over all surrounding buildings in the way in which much smaller churches soar over all surrounding buildings in other places. Even if it had towers in proportion to its size St. Peter of Westminster could never soar over Westminster in the way that St. Peter of York soars over York. At York it is not merely the towers, it is the bulk of the minster itself which rises above the city. The ridge of Westminster is 40 feet or more higher than that of York, but Westminster can never while it stands be the same predominant object which York is. It has still less chance of overtopping all its neighbours since a neighbouring building has sprung up by which it is itself overtopped. St. Peter's is higher than other English minsters, but it is not higher than they are in the proportion in which other buildings at Westminster are higher than the same kind of buildings in other English cities. Its positive size is therefore likely to be forgotten. But we are recalled to its positive size when we see that a parish church of the larger sort, with a tower which would alone be a prominent object in most towns, seems small by the side of it. Our ancient minsters were none of them built to stand alone. A great church, whether secular or monastic, was only part of a whole. It always had other buildings adjoining or standing near to it, grouping with it and thereby increasing its effect. Gateways, refectories, bishops' palaces, prebendal houses, wherever they retain their ancient character group with the church and improve its effect. Among these subordinate buildings a subordinate church is often found, and it always helps to set off its mightier neighbour to greater advantage. St. Margaret's is more important and needful for this purpose than the subordinate church anywhere else. It is an essential part of the group, which it would be the ruin of the whole effect of the abbey to take away.

The Repair of the roof of Sherborne Abbey, the condition of which was causing some anxiety, is to be taken in hand at once. At a meeting of the inhabitants of the town a report was presented by Mr. Bachelor, who has had experience at Chichester Cathedral and who volunteered his services. This showed that the principal defect is in the leadwork of the nave. It was decided to raise a fund for carrying out the necessary work, and Mr. J. K. Wingfield-Digby, M.P., promised 200*l.* on condition that the balance was forthcoming without recourse to bazaars and "jumble" sales. A considerable sum has already been raised.



## NOTES AND COMMENTS.

IT must be admitted that it is not always agreeable to be living in a house adjoining others which are in progress. But it is an everyday experience that tenants are willing to brave the inconvenience and, in fact, occupy houses while still incomplete. The case differs when building works are undertaken, which must inevitably disturb the rest of established tenants; but the Courts sometimes recognise the wisdom of living and letting live, and do not grant injunctions for the suspension of works when applied for. A few days ago there was a case before Mr. Justice SWINFEN-EADY in which the occupier of a house at Haverstock Hill sought to restrain the Charing Cross, Euston and Hampstead Railway from nightwork. It was said a crane was working day and night continuously, hauling out excavated material and letting down tube sections and other material necessary for the construction of the station, lifts and railway, and that the noise was an intolerable nuisance, a steam crane being worked within a few feet of plaintiff's bedroom. The defendants relied on the authority they possessed under their special Act, and their defence was supported by affidavits of their engineers, who testified that it was necessary with regard both to despatch and safety that the operations should be carried on continuously, and that the work was being accomplished by means of the best modern appliances, and with as little noise as possible. Under the circumstances there was hardly any other course open to the judge than to refuse the injunction. But as further claims are being made by the plaintiff, it was ordered that the motion stand over till trial, and he directed the action to be expedited, and put the parties on terms to deliver pleadings in a limited time, so that, considering the state of the business of the Court, the action would probably be tried very early next sittings. It is not for the public good that obstacles should be raised against the completion of railway works, especially in the Metropolis. But as the annoyance is, in the majority of cases, very serious to the occupants of adjoining houses, there should be a more general recognition of compensation to occupiers.

THERE was some reason in the statement that the modern Christmas in England was a creation of CHARLES DICKENS, and as hypercritics affirm that writer's influence is declining, so the hearty Christmas of the "Carol," the "Chimes," the "Haunted Man" is also on the wane. What DICKENS did was to revive a spirit that was very ancient in this country. Christmas has its archæology, and anyone who doubts that fact has only to read the book by Mr. W. T. DAWSON, called "Christmas: its Origin and Associations, together with its Historical Events and Festive Celebrations during Nineteen Centuries" (London: ELLIOT STOCK). Dr. PRIMROSE found as much pleasure in admiring happy human faces as some of his learned contemporaries did in gazing on the colours of a tulip or on the wings of butterflies. In the pages of Mr. DAWSON's book we have an historical account of the efforts which were made from a very early time to enable men to enjoy at least a brief spell of happiness, partly for the benefit of onlookers. The celebrations exercised influence more or less throughout the year. It is not impossible that the festivities were factors in the planning of English houses. For instance, we learn that when HENRY II. visited Ireland, where Christmas was never of much account, and wished to have festivities in Dublin, there was no building large enough, and it was necessary to improvise one for that special purpose. WILLIAM RUFUS and RICHARD II., with all their faults, kept up the old customs, and Christmas revels may have had much to do with the creation of Westminster Hall. To welcome crowds of neighbours sufficient space was indispensable, and the rough performances which were obligatory could not be gone through in holes and corners. In our time it is difficult to become merry on any stipulated day, but it is interesting to hear of a time when man's pessimistic spirit was more under control, and could be regulated according to the almanac. In the pages of "Christmas and its Associations" we can read of people who had some power to forget their cares, and the information is more acceptable than much else that passes as archæology.

SINCE The Cathedral Series was commenced in *The Architect* a great many descriptions of the buildings have appeared, varying in size and price. The latest is a single volume comprising not only the English but the Welsh and Scottish cathedrals, entitled "The Cathedrals of Great Britain: their History and Architecture," by the Rev. P. H. DITCHFIELD (DENT & Co.). Westminster and Beverley Abbeys are also described. It is a remarkable example of compression; the sentences are all short and each one contains a fact. The information given is as much if not more than the ordinary visitor will care to go through, and if time can be afforded afterwards to study, enough material is forthcoming. Students of architecture will often find a benefit in having the whole series of English cathedrals brought together for the sake of comparison, and this handy illustrated guide can be recommended. The author has received aid from deans and canons in residence. The illustrations, although on a small scale, are often interesting, especially those by Mr. RAILTON. Plans are given of the principal buildings. It is to be regretted that Truro Cathedral is not placed on the same footing as the old buildings. The author says, "The newness of this cathedral and the entire absence of any historical traditions and associations will perhaps hardly tempt travellers to journey so far west to see the creation of modern architects and builders." This is not an encouraging remark for living architects, and we do not approve of the theory that historical traditions and associations are to be the criteria for judging and enjoying a work of architecture. In all such cases it is well to take Dr. JOHNSON'S advice, and to clear the mind of cant. There are very few Mediæval churches which will sustain a rigorous criticism in all their parts. Nor is it only in design that modern buildings will sustain scrutiny. Cheap and unsound construction, or would-be massiveness of weak masonry, were known in the Ages of Faith. We must, therefore, demur to Mr. DITCHFIELD'S concluding observation, "Whether our modern architects can build so surely and so well as our ancient monks and priors time will show; but reports speak none too well of the substantial nature of all that has been done at Truro." If the author will take the trouble to read the last report of the cathedral committee he will find that those gentlemen are not alarmed about the slight imperfection which has appeared in one or two of the base stones, and which was caused by rigidity of construction and the theoretical perfection of the jointing.

So many theories have been evolved for an explanation of the fall of the Campanile, there seems to be a difficulty in finding one which can be considered novel. From inquiries instituted by a German specialist, it would now appear that the use of wood was one of the factors in the catastrophe. Beams of chestnut were, it is said, introduced in the inner part of the tower for the purpose of equalising the pressure as well as to serve as ties. The outer surfaces were in course of time destroyed by worms, whilst the inner decayed through dry-rot. Although some of the ends were covered with lead for protection dry rot made its way. It is asserted that Signor BONI, who has charge of the operations, has adopted this view of the origin of the disturbance.

LAST week we referred to the demands which had been made on M. OSIRIS in respect of the restoration of the Château of Malmaison. The French tribunals can sometimes be severe, especially in cases of unwarranted demands. The contractors employed by M. OSIRIS have been made to suffer. The contractor for masonry has not only had his claim reduced from 400,000 francs to 250,000 francs, or nearly one-half, but he has been ordered to pay seven-eighths of the expenses. The locksmith will have to pay M. OSIRIS 3,000 francs. The painter and the joiner will also have to meet the remainder of the costs.

## ILLUSTRATIONS.

HOUSE, PARK LANE, W.

CATHEDRAL SERIES: HEREFORD. NORTH WALL OF LADY CHAPEL. DIAPHR WORK AND CAPITALS IN NORTH TRANSEPT.

ADDITIONS TO QUARRY MOUNT, MERSTHAM.



## THE ARCHITECTURAL ASSOCIATION.

A MEETING of the Association was held on Friday evening last, Mr. H. T. Hare (president) in the chair. The following were elected as members:—Messrs. K. W. Booth, R. T. E. Neeves, W. H. L. Keay, Ernest Newton, H. H. Wigglesworth and Sir John Taylor, K.C.B. Mr. W. H. BIDLAKE read a paper entitled

### The Study and Delineation of Old Buildings.

The intimate association in the title of this paper of the study of old buildings and their delineation might suggest that there was an inseparable connection between them. Such, however, is far from the truth.

The study of old buildings does not necessarily involve their delineation or the delineation of them invariably imply their study. This statement seems self-evident—perhaps too self-evident to attract attention. A student is as a consequence advised to sketch and to measure old work without any qualifying advice as to what to study or how to study.

Growth is not helped by unsuitable food badly digested.

Measuring up bad examples and making drawings of them in a mechanical spirit will neither develop a student's taste nor his knowledge. Perhaps it did not occur to him that either his taste or his knowledge required developing. "Then," you ask him, "why make any measured drawings at all?" "Well, I thought it might be a good thing to get them published in one of the building journals," or, "One must have a set of show drawings to take round the offices to get a berth." More likely still they are made to compete for one of the Institute or Association prizes, or for the A.R.I.B.A. examination, or to play their part in a deeply-laid scheme worthy of an American company promoter. For if a student has made his finished drawings at a school of art he will send them in for a local prize. Having won this, they will appear at the national competition perhaps with a gold or silver medal award. They will then be passed on for the Institute silver medal, and the next year they will once more reappear, supported by sketches for the Pugin. They will by this time have been published in the building papers and the "Architectural Association Sketch Book," and will also have won for their author a seat in the office of some prominent London architect. And, finally, they will serve as testimonies of study for the Institute examination, if, indeed, they do not eventually once more reassert themselves in the garb of a monograph. And all this with the same set of drawings. Well, if measured drawing has not advanced the student's taste, it has at least helped to stimulate his commercial instinct.

But where does the study of old work come in? It would be interesting to learn how our wide-awake student came to select his subject. His principle is, the greatest effect for the least labour. Sound commercial doctrine. It must look costly, but be cheap. This man might verily have made his fortune if he had not elected to be an architect. He selected the portion of the building which he measured up because it was easy to get at and would make a telling set of drawings. Another student would select his subject "because it had not been done before, or because it was one of the subjects recommended by the Institute."

This desire to make the drawings rather than study the building naturally influences the method of work. Arrived at length face to face with the subject of his choice the student sets about drawing and measuring, and having taken all the leading dimensions and made more or less freehand drawings of the mouldings, and taken any further notes necessary to complete certain elevations or sections he has decided to illustrate, he buys, or himself takes photographs of ornamental detail sufficient to enable him to elaborate the drawings at home. Perhaps a month after his return and a hundred miles away from his building, he will commence plotting out his measurements. Some will not work out, and there is no chance of correcting them. He assumed the walls were at right angles and that the whole of the work was set out with the rigid accuracy of his tee-square and set-square. An examination of the photograph is then substituted for the study of the building, and a draughtsman's skill covers a multitude of inaccuracies. The drawings win the prize; that is sufficient. Such measured work is not study; indeed, I would go further and say such measured work prevents study by substituting the counterfeit for the genuine. I lay stress on this distinction or you will say, "Thou didst come here to bless measured drawings, and lo, thou hast cursed them altogether."

What, then, shall we say of the student who has substituted study by photography for measured work and sketching? It would be absurd to deny the value of photography to an architect, or the delights of its pursuit; but to take photographs of a building is not the way to study it. Here is a fine parish church. Suddenly the amateur architectural photographic enthusiast appears. He manoeuvres for a good point of view; sets down his camera; focuses; draws the dark slide; turns his

back to the building; removes the cap, and studies his watch; claps the cap on again; packs up, and rushes for the station. The enthusiast objects that this description is a caricature. Very well. Photograph at leisure and with great care; still, how can you judge the proportion of a façade when you see it standing on its head? "Do you know such or such a church?" asks one. "Oh yes, rather. I took at least a dozen snapshots of it last summer. I haven't developed them yet, but I hope they will come out all right." The amateur photographer objects with increased resentment. "It is absurd to suppose that you can spend some time about a building without forming a very good idea of it." Yes, but he forms his idea of it when he is walking round and thinking about it, just the precise part of his stay when he is not photographing it. Clearly if he is taking a dark interior which requires an hour and a half's exposure, he must be doing something whilst—and I think that one of the ways in which photography is an aid to the student is that it compels him to wander round and about a building, and observe it more in detail than he otherwise would do—whilst the cap is off his lens; that is unless he avails himself of the opportunity to go off to the inn and get lunch. Happily, those students whose ideal it is to obtain as many prizes as possible with one set of drawings or the minimum of study, as well as those who regard photography as an efficient substitute for pen and pencil, are in the minority, but it is as well to recognise wrong methods whilst we are in search of right ones.

Our aim, then, shall be to study the buildings themselves, and only to make drawings of them as a means to that end. If, as supplementary to this study, our drawings have been made with that artistic finish which is peculiar rather to the draughtsman than the student, so that they are awarded a medal or a studentship, so much the better. For no kind of study is assisted by slovenliness of expression, and therefore the careful study of a building should be embodied in the most painstaking description, both with pen and pencil. Herein lies the true connection between the study of old buildings and their delineation. By this study we seek to increase our knowledge and sharpen our æsthetic taste. This is our aim, and our subject will be selected accordingly. It will certainly be a subject with which we feel in sympathy, one which we feel drawn to by excellences of one kind or another which excite our enthusiasm and our desire to emulate them.

Let us cultivate catholicity, remembering that want of sympathy is often due to ignorance, and that whilst sympathy may stimulate study, study in turn may awaken sympathy. If, however, we feel that a building is bad in design, and that we shall learn nothing from it, we will not make measured drawings of it because no one else has, as yet, made them or for any other reason equally foolish. But how shall we study our building or such part of it as we may have selected? By measured drawing and sketching? What are these the only means of study? They are certainly the most frequently recognised means with architectural students and, perhaps, there are some who think them all sufficient.

I believe there are occasions when a pipe will serve us better than a 2-foot rule. A pipe makes one contemplative, and to walk round an old building in a contemplative mood is to have put oneself in train for studying it, for catching the spirit and romance of it. Under its kindly influence the imagination will conjure up from the stores of one's historical and archaeological learning—if it is there to conjure up—the conditions of society and the craft guilds, the observance and the ritual of the Church, and the quaint superstitious customs of the country folk at the time when the stones of the building were put together and which find expression in it in its arrangement and decoration. And falling thus into a sympathetic reverie, the eye wanders over the building, noting this or that point of interest whether of design or construction. Then leading our thoughts back to modern times, and the conditions of to-day, comparing and criticising and drawing conclusions, let us take out our note-book and write down our impressions whilst they are still warm, whilst the glow of feeling unlooses our powers of expression whether by descriptive note or pencil sketch. Very likely the building will live in our memory through all our future life; for we remember most what we feel most. It is particularly important to make a general study of the whole before making a particular study of a part, so that the relationship and proportion of one to the other may be adequately perceived. One may sometimes see a student fasten on some detail which attracted him on his first approach, and devote his time so exclusively to it that he leaves without any idea of its setting or the part it played in the whole building. Do not, therefore, study details without making a key sketch sufficient to show their position and relative value to their surroundings. Do not accept a design because it is old: it may be old and bad. Always keep the critical faculty on the alert. This habit is of the very essence of an architect's study of old buildings. You will not regard Salisbury as a model west front because it was built in the thirteenth century. Standing



in front of it you will question yourself: Is it good? Could it be improved? What are its defects? Perhaps it will remind you of a comparison you have made between the west fronts of Siena and Orvieto cathedrals, and your thoughts will turn from the confusion and irresolution of Salisbury to the commanding lines of Notre Dame. Then take out your notebook and try your hand at it. Take the west front as it is, and with as little alteration as possible pull it into shape. If you have a companion with you on your excursion, let him do the same, and then compare notes and discuss it together.

A companion of the right sort, that is, one who is equally bent on study, is a great gain on a sketching tour. Of course, he can hold the tape, but he can do greater service than that. He can come up and ask you what you think of such a building. This compels you to give an answer. If you reply merely, "Oh, very good," you are depriving yourself of an opinion more than you are depriving him—your own opinion, which you have not taken the trouble to form. If you are wise you will treat his question seriously. You will look at the building well, and in a critical frame of mind. Not only will the process of so doing lead you to notice many points which you would otherwise have passed over, but you will have subjected yourself to the healthy exercise of making up your mind. It will not only reveal the building to you, but you to yourself. Your companion will probably have formed some opinion of his own before asking yours, and he will differ from you in some points. This will lead to a more careful scrutiny of the building in search of evidence in favour either of your view or his, and in the end you will both have gained in knowledge and in the formation of critical taste. I know hardly any advantage in the study of old work greater than the discussion of it with a fellow-student who is thoughtful and well informed. If you are alone, do not on that account fail to come to a conclusion as to whether you like or dislike any building worth attention, and why you like it or dislike it. Keep a note-book for the purpose of writing down a critical description of such buildings. On first commencing such a practice you will be astonished to find how vague your impressions are. I am not here referring to those aggressively dogmatic opinions which characterise the very young student, who always regards the work of contemporary architects as beneath contempt. Such opinions are not the result of thought, nor are they founded on knowledge; they are simply a little preliminary crowing necessary in personal development, and remind one of Dr Jowett's remark to his students, "For we are none of us infallible, not even the youngest." Every student has a right to the belief in his own infallibility until life disillusion him; it is the man who has no opinion of himself and is unable to form one of anything else who is beyond hope.

As time goes on, the judgment, well practised by such method, is likely to become more and more self-reliant, for the mind will have laid up an ever-increasing store of knowledge for comparison and co-relation. Thus the study of this building is amplified by a previous study of a similar one, and the points of difference are noted and the reasons for them investigated. Perhaps it is that the building material is different, or that being rather later in date certain decorative forms show signs of change. In a third building of still later date these signs are amplified, and the student comparing this with that, begins to detect in the various examples which at first seemed isolated and apart a law of common development, a law of life. He now begins to generalise, timidly at first, but as new observations confirm or modify his previous conclusions, ever with greater boldness and wider range of view. He will then be in a position and have a right to theorise, and will from the habits of mind he has acquired, always bring his theories to the test of his facts. Now compare the position of a student who has adopted this method of study—although content with thumbnail sketches and notes, he may never have made a measured drawing—with the one who made one set of drawings and swept all the prizes away within reach. The world, judging by tangible and visible results, proclaims the latter the coming man. So he is at first, the other's day comes later but lasts longer.

How many prizes there are for drawings; how few for critical study. Is it not possible that at some future time, either at the Institute or the Association, more awards will be given for thinking, and especially for thinking and drawing combined? I think the essay prize is one of the most useful that the Institute offers, but the subject set is often one which the student can only illustrate by copying prints from books or photographs, and stimulates his reading rather than his critical faculties. What I think is wanted is a prize for an original and critical study of some particular class of buildings or parts of buildings easily accessible in this country, to be illustrated by sketches and measured drawings made by the student from the buildings themselves.

In the study which we are considering it will be very necessary to supplement work on the spot by also studying it in books, so as to furnish ourselves not only with the conclusions to which others have arrived on any particular subject, but to

acquire that general historical knowledge which, with the help of our own imagination, will enable us to set the design and construction of the buildings within the social and historical environment of the time. How can one study Stokesay Castle or Haddon Hall and understand the arrangements of their plans without knowing something of the social and domestic life of the times? Looking at the buildings will not teach us this, however cleverly we may guess at the purposes of this or that. We must go to Hallam and to Green. Again, we must learn about the conditions of labourer and craftsman, of the prevalence and organisation of guilds, of the position of the designer, the magister, of the force and direction of tradition, of the tools in use at the time and of the methods of working materials and incorporating them in the building.

We must not forget also to study the traditions, the ritual, and the history of the Church so far as they affect ecclesiastical building; this will also involve some knowledge of the distinctive requirements of the various religious orders. In the same way, some knowledge of the methods of attack and defence of the period will help us to understand military architecture. All this means systematic reading, which perhaps the everyday student does not feel disposed to undertake. Well is it for him that the Institute examination compels him to acquire some knowledge on these points in spite of himself. Vitruvius considered in his day that an architect should be a man of many accomplishments, and now as then an architect's culture will find expression in his buildings. In addition to this more general study, we must further investigate the circumstances of the particular building we are examining. To do this we must find out what we can of its history, and the part it has played and was intended to play in the past. We must especially inquire into the properties of the local materials of which it is built, and of any traditions of working them which still survive.

Old buildings are apt to seem impersonal to us. The colours with which nature has decorated them, as if to deceive us that they are her work and not man's, give them the air of being the product of the land around them, like rock and tree, and the human life that has thronged them since that far-away time when they were built confuses the vague glimpses of their founders like a veil drawn before a face. But we must not forget that they were designed by men so similar to ourselves that if one of them were to return to earth he would probably drop into our modern ways in a week; and we may therefore look at their work as we should that of a living architect, and try to read what was in the mind of the designer of this building or that, and ask ourselves, "What was he driving at?" No doubt he was hedged in by limitations similar to those of to-day. Even in the days of the Great Pyramid men could not build without cost, and they have not succeeded in doing so since. The whims of the client must at all times have stolen the architect's sleep. I think Magister Mutius probably found Pliny a very exacting client.

The limitations of site must have influenced all but the Romans, who thought nothing of excavating the hill for the level Forum of Trajan, or levelling up the ground on a gigantic concrete platform for the *Thermae* of Caracalla. The adaptation of a building to its site should engage the most earnest study. An unusual site, whether of shape or level, is the doom of the incompetent architect, but the triumph of the skilful one. From the Athenian Propylaea and Erechtheion to the rock of Mont St. Michel architectural history presents one long procession of buildings whose architects have presented them to the world as monuments of their genius.

Next notice the limitation of material and its influence on constructive and decorative forms. Ascertain the kind of stone procurable, whether in blocks or slabs and their available size, and note how this has influenced the character of the building and given an individual stamp to the buildings of a particular locality. The monolithic window-jamb of a Yorkshire cottage might be compared with the jointed jambs of a Cotswold one, and the influence of the use of flint in the Eastern counties might similarly be noted. Examples of the influence of material on design are to be found everywhere, however, to the seeing eye, and it is not within the scope of this paper to attempt to enumerate them. The point to be emphasised is the extreme importance of the subject to the study of old buildings. The particular tools in use have also played their part in the shaping and decorating of buildings, as in the dressing of stone or the adzing of timber. The use respectively of the chisel or drill in Roman acanthus sculpture, and the adze or chisel in Norman carving, gives a very distinctive appearance to the work. Doubtless there are many other limitations which have helped to determine the character of buildings, and which the student will detect in the particular building under study.

In narrowing our attention to any particular building we shall first of all examine the plan. This is of supreme importance. Within it somewhere, somehow, lies the soul of the building; all else is but the embodiment of it. See how the



various rooms are grouped together to suit the needs of the time, and note particularly the entrance, the hall and the staircase; also the position of the plan with regard to aspect and point of approach; how the levels work out with regard to the site, and how the house sets with the garden. In ecclesiastical and other work the plan in the same way is the key to the building, and merits our first attention.

Having examined the building from within, next see how the plan with which you are now familiar finds external expression. And first of all note the way in which it is roofed and the manner in which the various parts are grouped together. These are matters of great importance in architectural design and must always have been so, and must have been considered by the architect in the arrangement of his plan. How frequently nowadays are they not left to take their chance. It is the more important that the student should give his attention to these matters of massing and grouping, because by this means he is led to study buildings in the solid, and an antidote is in a measure found against the tendency to façade and elevation designing inseparable to the working out of a building on paper.

How much may be learnt from the design of old chimneys and the manner in which they contribute to the conception as a whole; how well was their value recognised by their builders. On the other hand, how often does an architect nowadays consider the disposition of his fireplaces in the plan so that the chimneys rising from the roof may group well together from the more important points of view?

Connected with this subject of roofing and chimneys, as well as with that of gables and turrets and cathedral towers, is that of sky-line. Study at the time of sunset—I will not be so impracticable as to say sunrise—when the purple outline is silhouetted against the sky. And, in like manner, learn the value of simple masses in twilight and moonlight, when the disturbing details are suppressed. From the study of these more general features you come to the details, or it may be that in any particular building it is some detail alone that is worth attention. Every building must, of course, be studied for the features of excellence it possesses, as a bee draws honey only from those flowers which produce nectar, and that critical sense to which I have already referred will prevent us from thinking we recognise them where they do not exist.

There are one or two ways by which I think we may make our visits to old buildings more valuable to us, which I may refer to in passing. And one is to set ourselves to plan and design some building of the same kind that we propose to study. To fully realise the difficulties of an achievement, so as to observe how they have been solved by others, one must make a similar attempt; this will reveal to us what those points are about which we need the help of other minds. Another excellent method of study is to take up some particular subject, such as, for instance, the design of chancel screens, and make a comparative study of it, just as if one were preparing an essay or a monograph on the subject.

I have hitherto considered the study of old buildings from observation and examination with the aid of the note-book only; we must now ask how this may be supplemented by their delineation. I say supplemented, because I think we should not regard old buildings as dead and lifeless forms to be dissected piecemeal. They are organic creations still instinct with antique life, and we must learn to know them before we portray them; we must examine the building as a whole before we begin to devote our especial attention to a part. Now in considering this delineation of old work, there are two factors to take note of, our subject and ourself, and we must be dutiful and just to both.

We must not turn away from the original for the sake of a flourish of the pencil on the one hand, nor need we, on the other hand, suppress any distinctive style of draughtsmanship which we have made our own, and which is rightly the expression of our own feeling and our own individuality.

An ideal measured drawing or sketch is one which truthfully represents the building, but which is at the same time executed with all the verve and character of the draughtsman. There are some buildings which would be barely interesting, as represented by measured drawings, did not the force of draughtsmanship fairly rivet our attention. Indeed, some of the finest buildings, which are fine because of their uninterrupted surfaces of wall and their bold projecting masses, are, if tamely represented by measured drawings, reduced to a few thin ink lines straggling over an expanse of the whitest Whatman paper. On the other hand, measured drawings must be line drawings, and it would be absurd to shade them up to give a suggestion of projecting surfaces in a picturesque fashion, although the reliefs might be systematically indicated by colour washes after the French manner by cast shadows. I think myself, however, it is best to leave the shadows alone. Measured drawings are for architects only—the public do not understand them, and are not interested in them—and architects would at once perceive the relative value of the surface of elevation from the accompanying plans. It is here that the

value of sketching comes in, for it enables us to judge the building as a solid, whilst the draughtsman is justified in making his drawing or sketch expressive of himself as well as representing his building. Affectation and trickiness are to be severely deprecated, and there is enough of both in the draughtsmanship of to-day.

We do not need to picture an innocent old manor-house as a snow building relieved in aggressive outline against the blackness of an inferno. The methods we shall adopt in representing any particular work will depend upon the character of the work and what it is of which we wish to keep a record. If it is a façade, we may make a measured drawing to a small scale; if a decorated sedilia, then one to a large scale; in either case the drawings will be accompanied by a sketch plan showing the position of the part which is illustrated, and the mouldings and details will be drawn out full size. All this will be done fully and thoroughly on the spot. If, on the other hand, it is the grouping of chimney and gable, the play of surface, the picturesqueness of setting, and a hundred other reasons, we shall find a sketch the most serviceable. We may wish to remember the charm of colours due to the use of various materials or some definite scheme of painted decoration, and a water-colour sketch or a tinted pencil drawing will serve us best. Or if the sky-line of some building seen against the evening sky attracts us, some brown paper and a piece of white chalk will be useful.

Our object is to catch and fix some particular point or feature which interested us, some beauty which excited our enthusiasm, and we may seize the means readiest at hand or best for our purpose, as the case may be, our only care being that we possess ourselves of our aim whatever the medium. If we have any artistic power, we shall find it will also lend itself to our self-expression.

Whilst we may well need our colour-boxes for the purposes I have described, we shall not, as architects, require to make water-colour studies of buildings whose charm lies in the tints of old age, the setting of foliage or the accidental colouring of sunset. Of course, as artists, we may indulge in such, but it forms no part of the study of old buildings.

But whatever we do, let us keep clear and active that critical faculty of which I have spoken earlier, so that, whether we are making measured drawings or sketch, we should remain conscious of the weak points of our subject and not lose ourselves in the glamour of its old-world charm. To this end let us write down in our note-book what our thoughts and impressions are at the time we are making our drawings, giving little marginal sketches illustrative of the manner we, at the time, considered the work might have been improved.

As regards the actual *modus operandi*, it would, I know, be impossible to say anything with which you are not already well acquainted. For sketching a block 16 by 10 is a very convenient size. Some prefer cartridge and some Whatman, whilst others would use sketch-books made of metallic paper. A miniature tee-square is sometimes useful for use with the sketch-block for setting up one or two guiding lines, but not to unduly assert itself. If, moreover, the tee-square has a scale marked on it, it is useful for plotting out a plan or measured sketch. Some find cross-ruled paper convenient for this purpose. Pencils should be of good quality, and there is more than one way of sharpening them. It is impossible to give any character to a sketch if they are too hard or too sharp, and if the lead is brought to an edge rather than a point, one can get a greater latitude of stroke by using either the edge or the broad side.

A sketch is not an elaborately-finished pencil drawing; it is an abstract embodying just those features in the original it is desirable to portray. Certain parts will, therefore, be more or less finished in detail, while the rest are merely indicated by a few expressive lines. The lead pencil must be spared as if it were precious, except at those points of telling shade or accent where it may be rich and black. A few colour washes or strokes of coloured chalk may sometimes be useful to record the local colouring of material. Some have done excellent work with graphite, treated like a neutral wash, for indicating light and shade, but it is not a very sympathetic medium. A few dimensions on a sketch, with one or two sketch details in the margin, will make it more useful.

It is, of course, unnecessary to insist here on the value of a complete knowledge of perspective. All measured work should be plotted and drawn out to scale on the spot. Capitals and other curved work may be merely indicated in these drawings and numbered, and large freehand studies in soft pencil, crayon or charcoal made and distinguished by corresponding numbers, which will enable one to finish up the scale drawings afterwards if necessary. Do not assume that everything is set out with rigid accuracy, that the plan is always rectangular, that two halves are alike, or that flowing tracery can be set out from centres. If we cannot perceive the absence of the mechanical in old work, we shall be blind to one of its great charms. Always show the stone jointing of the more important and decorative parts, and of the tracery of



windows, and clearly indicate the treatment of wall surface. In the same way show the jointing and framing of carpentry, and do not hesitate to add explanatory notes to the drawing. Mouldings should always be drawn out full size and carefully measured. Strips of lead and such contrivances for obtaining their contour are worse than useless. Place the arch mould over the jamb mould and show the outline of the caps, and as a rule make all your full-size details as you would if you were sending them out to some mason or carpenter to be executed. They should have a business air about them and not a show-drawing look. If, however, you are proposing to send them in for a prize, arrange them carefully on sheets of uniform size mounted on cardboard, and do not think you are making them look more artistic by some ridiculous and fantastic printing.

The joys and the sorrows of a sketching tour might well claim an essay to themselves, but it might be of service to indicate some of the items of equipment. Of course, pencils, brushes, instruments, scales, colour-box, water bottle, sketch-books and sketch-blocks, tape, plumb-line and level must be included. A 2-foot rule in your pocket is indispensable; so too is a 5/- note. Plenty of drawing-pins—but do not leave them about on cathedral chairs. A sketching stool—a collapsible one—but not while you are sitting on it. A double elephant is naturally too heavy to carry about, but half a double-elephant board, and a roll of paper to correspond, is a useful size. The tee-square will of course be made to suit, and if the board is accurate and square a set-square may be dispensed with; it is only one more thing to forget and leave behind. Callipers will be needed to take the diameters of shafts and mouldings, and a stout piece of copper wire serves as a calliper for larger shafts. A 5-feet or a 10-feet jointed rod is also necessary. By a little ingenuity an American leather satchel can be contrived the size of the drawing-board, with pockets of various sizes, and the whole strapped together with a handle-strap, the sketching-stool, rod and tee-square being threaded through the back, and a leather label attached in case you should leave it all in the train.

With all this equipment, and a few weeks' stay in a good architectural district, you will no doubt enrich your sketch-book, and, what is of still more importance, you will increase your knowledge and educate your taste, which will be reflected in those buildings which you may yourself have to design, and, recognising their charm, perhaps some student of the far-distant future, whose great-grandparents are not yet born, will measure up your work, now mellowed with age and nature's tints, and speak sympathetically of those dear old architects of King Edward's reign, who knew so well how to put their soul into their work.

Mr. W. J. N. MILLARD, who proposed a hearty vote of thanks to the author, said the paper was full of advice valuable to those men who were beginning in the profession, and also to those already in practice. In discussing the paper they might as well go back to the beginning, and test the question, Why study and delineate old buildings at all? The speaker suggested that they wished to know something about the old buildings, but it was well to realise what this meant. Drawings were to be seen of old work which showed little or no desire for acquiring a knowledge of the spirit which gave the building its character. If an architect wanted to know anything of a building he should know everything. There were two kinds of drawing—the perspective view and the geometrical. It might happen that the architect in his sketches wanted to know more than his drawings could tell him, and therefore it was important that he should know the whole life history of the buildings. It was necessary to learn the influences that were at work on the minds of the men who fashioned them. The student of architecture was, therefore, the student of history. It was not enough to draw a building to know its history, but if it was drawn thoroughly the plan would be the root of its meaning. This was especially the case in England, and old churches were found to be the growth of different periods, and the result of a number of men adding to one another's work. An investigation of this kind helped the student to arrive at the life of the building.

Mr. A. MITCHELL seconded the motion. He said the attraction of photography was dangerous to the young architect. The moment a man began to photograph buildings he was lost as a sketcher, and when he ceased to be a sketcher he lost much of the power and interest which could help him in his own work. The critical faculty was one to be cultivated, but it did not seem necessary to offer such advice to members of the Association. The opinions expressed during their afternoon excursions proved this.

Mr. G. LUCAS, in supporting the vote, suggested that sketching seemed the requirement of the modern architect. He questioned whether the earlier architects attained their good results through such study.

Mr. A. T. BOLTON said the young student should measure work before he began to make sketches. The first drawings were often disappointing, and the progress so slow that the

beginner lost heart, whereas in the measuring the student had solid results to show for his labour, and he did in this way learn something about the plan, and had prepared the way towards sketching later on.

The PRESIDENT in putting the vote said the most essential point in the sketching and study of old buildings was to keep the mind on the work, and to try and understand it by analysing the component parts and their relation to one another. Photography could be of real assistance to the architect. There was often a temptation in sketching to make merely a picture of an old building, but aided by a camera an architect could avoid the evil, and by his photographs learn the history which the building offered to him.

Mr. BIDLAKE, in reply, said the plan of an old building presented a problem to study, not being the result of one man's work or the expression of one time. Modern work did not offer the same exercise to the student. By the study of the plan of a building the student, if he was intelligent, would read its history, and through the history of the building he would learn the customs and the social life of the time. The study, therefore, of old buildings absolutely involved the study of history. There was no doubt that the earlier architects made measurements or sketches of work which preceded theirs. Vasari and other authorities mentioned architects who made journeys with that end in view.

### FASHION IN ARCHITECTURAL DESIGN.\*

IN the short paper which I have prepared for discussion I wish it to be very distinctly understood that I am not speaking at all didactically, nor even critically, so much as interrogatively, and that in the points I may raise and the questions I may ask I am interrogating myself quite as much as I am my audience.

It has often been said that a child can ask questions which the wisest man cannot answer, and therefore, *a fortiori*, it must even more frequently be true that a man of ordinary intelligence can raise questions which he himself cannot satisfactory reply to. My object, then, in selecting the question of "The Tendency to Fashion in Architectural Design" as the subject upon which to invite your opinion and testimony has been a very genuine desire for discussion upon this subject, which I think should be of interest to us all. I propose to consider the question of necessity briefly, and therefore suggestively, rather than at all exhaustively, under the following headings, viz.:—1, its acknowledgment; 2, its influence; 3, its causes; 4, its lessons.

1. *Its Acknowledgment.*—I take it for granted that, as human nature is very much alike in its sensations in the average man, it can hardly be a novel experience for anyone who has been in practice for any considerable number of years, to find himself on looking back awaking to a recognition of the fact that vogue or fashion have from time to time played no unimportant part in his judgment in design, so much so, indeed, as to have caused him sometimes consciously, but often partly unconsciously, gradually to abandon one style of treatment in favour of another, not necessarily from any definite principle of new methods of construction or of special local conditions, but rather from the fact that such style of treatment has become the fashion, with the consequent result that after a time he has found himself thinking almost entirely in the current style and judging everything from its canons. Still further is he led to an acknowledgment of this from the fact that so short-lived sometimes has been the duration of such current fashions that he may easily, within his own experience, have found himself working for a period in perhaps three or four styles in succession, and discarding in turn what may in some cases previously have been even specially cherished forms or outlines. As an illustration of what I mean one has only to point out that in English architecture, to which, of course, I am referring, half a lifetime ago Gothic forms were being freely adopted for every class of public building, houses of Parliament, town halls, law courts, hotels and street façades; a few years later and Queen Anne forms and outlines have come into vogue; again, a few years and Romanesque treatment tinges nearly everything; while now a Georgian type is reasserting itself. Without referring specially to Barry's Houses of Parliament, which were, of course, rather earlier, nor to Street's Law Courts, which perhaps helped to kill the style as well as the author, let us ask, Would any one in the present year design a Gothic town hall? Yet most of us remember the acclaim which greeted Mr. Waterhouse's Manchester town hall. Or, again, let us ask, Would the treatment shown in the Romanesque design of Mr. Waterhouse's Natural History Museum or in

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that of Mr. Aston Webb for the Imperial Institute, which many prefer to the accepted design, be put forth by even these same masters to-day? For answer look at Mr. Aston Webb's recent design for the South Kensington Royal College of Science. Again, in Domestic architecture similar phases of fashion have ensued, and at one period of our practice the fullest possible exhibition of all construction has been the vogue, and any wooden boxing and casing have been decried as wanting in truth, while within a few years we are once more calmly contemplating heavily boxed pediments and eaves with mock brackets hung thereto, carried by instead of carrying them, and other finishings which, only a few years ago, were the subject of reprobation. Still again, as applied to internal domestic decorative treatment and furniture, we must all acknowledge that fashion plays so large a part that forms which at one time are regarded with favour in a few years time are looked at with disapproval, and even with distaste. And who will venture to say that a few years hence the forms which are now in favour will not in their turn be eclipsed by a recurrence or modification of some other treatment, perhaps even of Gothic or Romanesque? So much then as to the "acknowledgment" of this tendency to fashion, and now let us consider our second heading, viz. :—

2. *Its Influence.*—The first question which I think one not unnaturally asks oneself after reflection upon the foregoing is something like the following, viz. :—To what extent does vogue or fashion influence our sense of what is beautiful? or, in other words, is educated human judgment so unreliable that forms at one time regarded as beautiful can at another period be thought otherwise? I have said "educated" human judgment, because I am not of course dealing with that first development, or enlightenment which should be the natural sequence of educating anyone for his calling, but rather with that more subtle influence which comes as the result of dealing for any length of time with particular forms and combinations to the exclusion of others. Further, I am using the word "beautiful" in a very general sense, merely as expressing or defining anything that is pleasing or gratifying to the sense of sight, whether rugged or graceful, majestic or picturesque, symmetrical or irregular. Of course already a parallel on a lower plane will have suggested itself to your minds in the application of the same question to the subject of costume. If we wish to gauge the influence which fashion has had upon our power of personal judgment in the matter of "costume," let us look through a photograph album containing photographs extending over the last twenty-five years, and as we smile and make merry over some fashions of costume, either male or female, the peculiarities and extravagancies of which are now so very evident to us, let us ask ourselves why at the date, when these costumes were in fashion, our sense of perception was so far blunted by their currency as to at least partially blind us to a true sense of their grotesqueness, and then with more seriousness further ask ourselves the question which should be one of especial importance in our profession, viz. to what extent is our own judgment of what is becoming or beautiful narrowed and warped by ideas current for the time, that is, by fashion? Since writing the foregoing my attention has been drawn by a friend, to whom I have submitted my notes, to so similar an argument and illustration in the recent work of a very distinguished statesman that I am tempted with, I hope, a pardonable sense of gratified satisfaction to quote therefrom. The Hon. A. J. Balfour, the present Prime Minister of the Empire, in his book on "The Foundations of Belief," treats in his second chapter under the heading of "Naturalism and Æsthetic" on "The emotions excited by the beautiful" and in the course of his argument says, "Let us ask why every 'public' has a taste? And why at least in western communities that taste is so apt to alter? Why is there so much uniformity, and why is there so much change?" and then he illustrates his argument as follows:—"The question of uniformity is best approached at the humbler end of the æsthetic scale, in connection not with art in its narrower and loftier sense but with dress. Everybody is acquainted either by observation or by personal experience with the coercive force of fashion; but not everybody is aware what an instructive and interesting phenomenon it presents. Consider the case of bonnets. During the same season all persons belonging, or aspiring to belong to the same 'public,' if they wear bonnets at all, wear bonnets modelled on the same type. Why do they do this? If we were asking a similar question, not about bonnets, but about steam-engines, the answer would be plain. People tend at the same date to use the same kind of engine for the same kind of purpose, because it is the best available. They change this practice when a better one is invented. But, as so used, the words 'better' and 'best' have no application to modern dress. Neither efficiency nor economy, it will at once be admitted, supply the grounds of choice or the motives of variation. If, again, we were asking the question about some great phase of art we should probably be told that the general acceptance of it by a whole generation was due to

some important combination of historic causes, acting alike on artist and on public. Such causes no doubt exist, and have existed; but the case of fashion proves that uniformity is not produced by them alone, since it will hardly be pretended that there is any widely diffused cause in the social environment, except the coercive operation of fashion itself, which should make the bonnets which were thought becoming in 1881 unbecoming in the year 1892."

Further on he continues as follows:—"It may perhaps be hazarded that this uniformity of practice, produced by a complex group of causes, which we denominate 'fashion,' is a uniformity of practice alone, not of taste or feeling, and has no real relation to any æsthetic problem whatever. This is a question the answer to which can be supplied, I apprehend, by observation alone, and the answer, which observation enables us to give, seems to me quite ambiguous. If, as is possible, my readers have but small experience in such matters themselves, let them examine the experiences of their acquaintance. They will find, if I mistake not, that by whatever means conformity to a particular pattern may have been brought about, those who conform are not as a rule conscious of coercion by an external and arbitrary authority. They yield no unwilling obedience. On the contrary, their admiration for 'a well-dressed person' is, at least, as genuine an æsthetic approval as any they are in the habit of expressing for other forms of beauty, just as their objection to an outworn fashion is based on a perfectly genuine æsthetic dislike. They are repelled by the unaccustomed sight. It appears to them ugly, even grotesque, and they turn from it with an aversion as disinterested, as unperturbed by personal or society considerations, as if they were critics contemplating the production of some pretender in the region of great art."

There is more to the same purpose that I might quote with advantage, were it not for the fear of unduly lengthening my paper. Sufficient will have been quoted, however, I think to confirm my argument as to the reality of the influence of fashion upon taste upon this lower plane, and noting as we have done under our first heading the fact of changes of fashion in architecture, who will venture to deny its influence upon judgment and taste in this higher domain of art? Let us apply them to architecture, the question with which I commenced this heading, and we shall, I think, find food for much reflection as we try to rid our minds of all merely passing influences, and to estimate apart therefrom the beauty or otherwise each of its own kind of differing forms and combinations. Possibly also we shall find a corrective to that tendency to narrowness of judgment which is a temptation that lies in wait for all specialists, and which almost inevitably ensues from concentrating one's thoughts too exclusively upon any particular set of forms or ideas to the exclusion of all others. Let us pass next to our third heading, viz. :—

3. *Its Causes.*—In answer to what has already been said as to changes of fashion in architectural treatment, one may reply that he does not pretend to argue that beauty in architecture is confined to any particular type or style, but rather that as there are many and varied types of beauty in nature so there may be a beauty of its own in each or every recognised style, which brings us to another question, viz. :—If each style possesses beauty, why should it be even temporarily discarded? or, in other words, to what causes are we to ascribe this tendency to fashion? One could better understand changes of style and appreciate them as indicating life or growth if one could give a definite reason or explanation for them by being able, for instance, to trace a natural development of any current style from its predecessors, as was the case in the development of English Gothic, or if such change were always due to more modern methods of construction, as was the case in the change from trabeated to arched design; but while one can sometimes see or think he sees traces of the influence upon style of the adaptation of certain materials to new or altered uses or to later methods of construction, I think one must look elsewhere for the true explanation or reason for the frequent changes of style noticeable in recent years. Restlessness and the love of novelty have, I think, something to do with such frequency, for we live in a restless and excitement-loving age, an age in which an artist will vary rather than be guilty, as he thinks, of repetition, and so will vary for the better if he can, but possibly even for the worse rather than not at all; added to which is, I think, one very potent factor which I do not think has been previously expressed, viz. the loss of pleasure in any previously favoured treatment which our master artists must suffer from the contemplation of vulgarised and perhaps grotesque reproductions of their creations in all sorts of inappropriate as well as appropriate places. Under the previous heading I spoke of the parallel on a lower plane in the application of the same questions to "costume," and under this heading the same illustration may be further applied. A costume with some new, and perhaps artistic emphasis of form or colour, is introduced by the creators of fashion, and what is the result? Before the end of its currency its emphasis is exceeded and out-emphasised in blatant and vulgarised forms until the artistic originators



must in some cases shudderingly revolt from their own creation, and as far as possible alter every combination of form and colour in their next effort. This explanation will, I think, apply not only to general architectural design, but with even greater force to Domestic architecture and decorative treatment, and a due consideration and digestion of it should help to correct our tendencies towards novelty purely for novelty's sake, which are always dangerous from an artistic point of view, and are liable, especially in a self-advertising age, to degenerate into the vulgarity of primarily considering not so much what is beautiful as what will attract attention, a principle as destructive of true art as pot-boilers are of true painting or novelettes of true literature. And now let us as briefly as possible consider under our last heading;

4. *Its Lessons.*—Under our second heading, it will be remembered, we asked:—"To what extent does vogue or fashion influence our sense of what is beautiful?" Now, before we can deduce from our subject any lessons to help us at all, we must, I think, first ask the more important question, What constitutes beauty in architecture? I have already suggested that some may say, that as there are various types of beauty in nature, so there may be a beauty of its own in each or every recognised style of architecture; to which I may add that as in nature one type of beauty appeals more to one and another to another, so also in architecture one style may not unnaturally appeal more to one and another to another, from which in passing one may deduce the simple first lesson of exercising due allowance towards the opinions and tastes of other qualified critics, and of avoiding the narrowness of setting up one's own personal predilection or taste as the sole gauge of what is beautiful. Granting this variety of type, however, there still surely must be consistently therewith certain underlying principles or canons of judgment as to what is beautiful in architecture applicable to all styles having any claim to consideration, and independent of all mere changes of fashion, and which should appeal as effectually to the educated eye as the canons of musical harmony do to the educated ear. I may remind you again that I am using the word beautiful in no special sense, but merely as expressing that which is pleasing or gratifying to the sense of sight. In considering, then, canons of judgment as to what constitutes beauty in architecture, I would point out, first, that an architect has, I think, to deal with four elements capable of beauty, viz. material, form, enrichment and colour, and that he has four conditions to consider in producing beauty from these elements, viz. purpose, congruity, proportion and harmony. Let us look first at the four elements capable of beauty. There is, of course, capacity for beauty in some materials themselves, independently of form or enrichment. Capacity for beauty in form needs no explanation, this being the architect's necessary element, while capacity for beauty in enrichment and in colour may be considered as to some extent his luxuries. And now let us consider the four conditions which I have named for the production of beauty from these elements, viz. purpose, congruity, proportion and harmony. Purpose, I would define as the reason or intention which the various parts of a design should manifest. Congruity, I would define as appropriateness or fitness for its intention. Proportion, as the relation of parts in a design in respect to size or quantity. Harmony, as the relation of parts in respect to quality. Now, it will be found that these four conditions may be applied to each of the four elements which, perhaps, may be most easily illustrated by negative examples. For instance, as regards "purpose," there may be want of purpose in reference to materials, *e.g.* in using a perishable material in a wrong position; there may be want of purpose as regards form, *e.g.* in that not uncommon feature of attaching columns to the front of a building and letting them carry nothing but their own width of entablature; and there may be purposelessness in enrichment or colour, *e.g.* in providing these in wrong places. Again, as regards "congruity," there may be incongruity in reference to materials, *e.g.* in building a stable or bulk store of costly marble; there may be incongruity in reference to form, *e.g.* in designing either with the outline of a Greek temple; there may be incongruity in reference to enrichment or colour, in bestowing chaste carving or high-class colour decoration upon such buildings. Again, as regards "proportion," there may be disproportion in the use of two materials, such as brick and stone, in an elevation; there may be disproportion of form, of course, in every relation; there may be disproportion of enrichment in respect to quantity, for instance in overloading, and there may be disproportion of colour in quantity, *i.e.* in the predominance of any colour or colours quite apart from their harmony. Lastly, as regards "harmony," *i.e.* the relation of parts in respect to quality; there may be a lack of harmony in the use of materials, *e.g.* in using slates and shingles together on a roof; there may be lack of harmony in form, as *e.g.* if one were to insert Gothic windows into the Royal Exchange or the Bank of England; there may be lack of harmony in enrichment,

*e.g.* in bestowing delicate carving on a coarse and cheap material; and lack of harmony in colour, of course, needs no illustration.

You will observe that in this question of what is beautiful we are dealing, of course, with the æsthetic side of architecture only, and are leaving out of consideration altogether the practical side, though it will be noticed that even on the æsthetic side, under the condition which I have called "congruity," the eye is dissatisfied with any inappropriateness or unfitness for its intention in a building. To enlarge at any length upon these elements and conditions would be, of course, to write a volume instead of a paper. I wish, however, to refer briefly to two of these conditions which I think bear more particularly upon my subject, viz. (1) Purpose, and (2) one attribute of proportion which I may call "Restraint." "Purpose" I have already defined as the reason or intention which the various parts of a design should manifest.

It is the desire for "purpose" which makes the child, the untutored ask, for example, "What is that thing for?" as they watch a corbel placed in position, and which leaves the eye unsatisfied in respect thereto until it sees the roof principal bearing thereon. Now, I think you will agree with me that if this condition of "purpose" or reason be faithfully applied to each and every feature that we may adopt, one corrective to the influence of mere fashion will always be at hand, for while we may hail and adopt with pleasure any new adaptation of form or material that has reason and purpose behind it, we shall hesitate to follow what may be a questionable because a purposeless effect. By "restraint" I mean that educated sense which in a well-balanced and refined mind checks tendencies to excess or extravagance in the uses of material, form, enrichment, or colour. It is this attribute of "restraint" or moderation which intuitively prevents the refined lady from rushing to extremes of fashion in costume, and which, with no less potency, should restrain the refined and true artist from the degeneracy to which I have already referred of primarily considering, not so much what is beautiful, as what will attract attention. It tends always to the side of simplicity rather than complexity, and is an element of that self-mastery which is one of the highest results of all true education.

To sum up, then, I think that among the various lessons which our subject suggests not the least important are the following:—(1) The avoidance both of narrowness and arrogance in judgment. (2) The application especially of the principle of "purpose" to all parts of our designs. (3) Restraint and freedom from excesses and all mere eccentricities—lessons which, may I say, I am conscious of requiring to apply to myself probably more than to my audience, and which, if my paper has served no other purpose, it has helped to bring before my own mind in more definite form.

#### EDINBURGH ARCHITECTURAL ASSOCIATION.

AT a meeting of the Edinburgh Architectural Association on the 17th inst. Mr. Thomas W. Aldwinckle, F.R.I.B.A., London, delivered a lecture on the erection of isolation hospitals in times of emergency. The lecture was for the most part a description, illustrated by plans, of the hospitals erected in connection with recent epidemics in London. In the course of some introductory remarks he described the general methods of building a hospital under pressure of an epidemic such as the Metropolitan Asylums Board had to contend with this year. In order to build a properly equipped infectious hospital in a few weeks, the ordinary procedure, he said, would be quite out of the question. There was no time for elaborate plans, for bills of quantities or for inviting tenders by advertisement. The architect selected should be thoroughly conversant by previous experience with this class of work, and it was equally important to have an expert and trustworthy builder. As there was no time to enter into a contract for a fixed sum, the amount to be paid to the builder must be based upon a schedule or left for valuation. There was one important question which arose in connection with these emergency hospitals about which there was considerable difference of opinion—whether the buildings should be made of as permanent a character as possible, consistently with speed of erection, or be "knocked up," so as to last a short time and be afterwards pulled down. Much depended on the circumstances of the case. The cheaper method of building was considered advisable by some on the grounds, firstly, of economy, and secondly on the ground that the sooner an infectious building was destroyed the better. As to the latter, there were now no difficulties in the way of thoroughly disinfecting a building; as to the former, he doubted whether it was a true economy. Personally he was strongly of opinion that the truest economy was to erect those emergency hospitals in as permanent a way as would be consistent with a high rate of speed. It might be taken for granted that if the isolation hospital was wanted at the present time it would be wanted in the future, and



if such be the case the permanent construction was the truest economy. It should also be borne in mind that the whole of the sanitary arrangements must be good, and consequently expensive, and that all these would be practically wasted in a merely temporary building. Referring to the details of construction, he advocated a good platform of cement for the whole building; the walls and partitions of fir quartering, with the outer walls covered with diagonal boarding, felt and corrugated iron. The roof, which should be of the ordinary timber construction, should also be covered with diagonal boarding, felt and corrugated iron. The internal finishings were also described in detail. He did not, he said, admit the principle of a second quality in sanitary work. The patients were just as ill in a temporary as in a permanent hospital, and required the same advantages of perfect sanitation. The same remark applied to warming and ventilation. It was preferable to warm by means of open fireplaces, supplemented by low-pressure hot-water or steam apparatus. It took some time to build brick fireplaces, and sometimes this was not practicable, but a great effort should be made to provide these, as an open fireplace was after all about the best exhaust ventilator that could be found. It was of vital importance that as emergency hospitals were somewhat more inflammable than an ordinary permanent hospital, very complete and adequate fire-extinguishing appliances should be provided, as also a complete system of fire-alarms. In concluding, Mr. Aldwinckle gave particulars of an emergency hospital of 612 beds he had erected this year for the Metropolitan Asylums Board, together with its administrative staff quarters and administrative buildings at Gore Farm, near Dartford. His firm was instructed on January 9. It was arranged (in case of fresh developments of smallpox) that the new hospital should be opened in stages as completed, so that no time should be lost. The boiler-house, laundry and kitchen were ready on February 22, the ten temporary ward pavilions a week later, the administrative block on April 7, the six staff homes and eleven ward pavilions on April 21, and the remainder of the hospital on May 3. The number of men employed was 2,600; 6,000*l.* was spent in providing sleeping huts for some 1,100 men, and about 1,200*l.* in having them vaccinated and in other incidental expenses, the new hospital being close to one that was full of smallpox patients. The erection of isolation hospitals in times of emergency was very costly. That such emergencies should occur demonstrated the extreme difficulty of accurately estimating the margin to be allowed in the provision for infectious diseases, and more especially in the case of smallpox, the course of which was most erratic. This applied alike to large and small communities, and as these emergencies were not only possible, but probable, it would always be useful to understand the best methods by which to grapple with them, and thus prevent an outbreak from developing into an epidemic, a result which the Metropolitan Asylums Board had fortunately been able to achieve in connection with the visitation of smallpox in London during the present year. Over the meeting, which was well attended, Mr. A. Hunter Crawford presided. In the course of the evening the services of Mr. T. Fairbairn, who had been hon. secretary for twenty years, were acknowledged by a presentation, which was made to him by Mr. Thomas Ross, on behalf of the Association.

#### EDINBURGH SCHOOL OF APPLIED ART.

THE annual exhibition of work executed by the students of the School of Applied Art at present on view in the galleries of the Royal Scottish Academy is undoubtedly one of the most comprehensive and interesting displays of the kind that the school has yet produced. The galleries are hung from end to end with line and colour drawings, and there is an overflow upon screens on the floor. It seems, however, that what is shown is, says the *Scotsman*, only a part of the harvest of the year—a fact proving the school to be in a state of healthy activity, and that the students are no laggards in their work. It may incidentally be said that despite the withdrawal of the grant by the Town Council, which formed a considerable part of the resources of the managers, the school has begun its present session under the direction of Mr. Alfred Greig, who was appointed headmaster last year, with every promise of continued success. The fees to students had to be raised, but the high position the school has taken as a practical educative centre has been so well recognised that there was no diminution in the number of applicants for admission. The session, indeed, opened with the largest attendance—viz. eighty pupils—that has ever been enrolled, that being the maximum of pupils that can be accommodated in the classrooms in the Royal Institution. The morning class, which meets every morning at 8 o'clock, is quite full, and the evening class, which assembles four times a week from seven to nine o'clock, has also practically its contingent of students. There has been so

much discussion about this school lately that in order to enable the public to judge for themselves as to the position it occupies in the scheme of art education in Edinburgh, the work done by the students has been hung in complete sections, which give an excellent idea of the system of training extended to the various grades from the first to the fifth year of the curriculum. Under the first group are studies of the elementary and the more advanced principles of design executed by students of the various years, also studies in perspective, sciography, and sketching from the cast. Here likewise are shown the works of the figure and colour classes, these comprising charcoal drawings from the antique, and studies in water-colour from grouped models, flowers, &c. The colourwork is particularly good, the restrained handling employed being that best suited for decorative effect. The second group is filled by works of the Saturday afternoon sketching classes, consisting of measured drawings and sketches of some of the best existing examples of Scottish art to be found in the neighbourhood of Edinburgh in stone and metalwork, furniture, carving, &c. The third group comprises the work of the modelling class, viz. works modelled in clay from casts of historic ornament. The fourth section is devoted to holiday work. Small money grants are made to the best students for the purpose of study during the holiday season, and the drawings made under these conditions, consisting as they do of examples of art in stonework, woodwork, metal, glass and colour decoration from all parts of Scotland and England, form a most interesting feature in the exhibition. Then there are travelling scholarships awarded to students at the completion of their curriculum for the purpose of four months' study in the United Kingdom, and the work sent in by these bursars this year is particularly worthy of notice for its variety of feature and high quality. A group of drawings by Mr. David C. Ramsay, furniture designer, studied for the most part at South Kensington, shows excellent draughtsmanship, and an appreciation of the beauty of French and other furniture; Mr. James Gillespie and Mr. Will Davidson, architectural draughtsmen, exhibit work also of merit, comprising a large number of measured drawings and sketches of some of the finest Ecclesiastical and Domestic architecture in England. Mr. Davidson also contributes some excellent studies in colour of ancient stained glass and colour decoration from chancel screens in Norfolk. Lastly, there is a group of drawings connected with what is called the National Art Survey of Scotland. These consist of measured record drawings of Kelso, Jedburgh and Melrose abbeys, and various examples of Scottish Domestic architecture, prepared during the past year by the students who gained this scholarship—these drawings remaining the property of the school. It will be seen from this summary of the contents of the exhibition that a wide range of important study is covered in this school, which its directors hope will not be lost sight of in any arrangements which may be made in the near future for art education in Scotland.

#### THE VICTORIA MEMORIAL AT NICE.

A CORRESPONDENT of the *Times* at Nice writes:—The Queen Victoria Memorial on the Riviera, for which subscriptions were collected last year, is for the present a serious subject of contention, as the form which the memorial shall take cannot be decided upon to suit all the subscribers. A memorial committee was formed last season at Nice under the presidency of the British Consul, and at a public meeting it was decided that the most useful and appropriate form of memorial to Her late Majesty would be a cottage hospital in or near Nice, which should be available for English-speaking patients, irrespective of creed. This proposal, though carried by a great majority of those persons present at the meeting, did not meet with the general approval of all the old British residents, who were in favour of a less ambitious scheme and one more within their means. The hospital idea has nevertheless been adhered to, and at a recent meeting of the memorial committee it was decided to commence building as soon as the sum of 2,000*l.* was in hand. A circular letter, signed by many of the old residents, has now been issued, objecting to this decision of the memorial committee on several grounds. It is contended that far too small a sum is mentioned as enough to erect and maintain even a small hospital of eight or ten beds, and it is pointed out that the only land suitable for such a building in or near Nice would cost at the very least some 500*l.* This is allowing for legal expenses and counting as enough a small plot of land about a sixth of an acre in area, but without reckoning the cost of building, which for bare bricks and mortar could scarcely be less than 1,900*l.*, making a total for land and unfurnished building of 2,400*l.* Then as to the income necessary to maintain even this small establishment, it is calculated that 450*l.* to 500*l.* at least would be required, of which at present only about 150*l.* is promised. There are also the unforeseen expenses which inevitably



arise in connection with every institution of the kind, and it is asked where this considerable sum is to come from. In addition, there is a question as to whether there is sufficient necessity for this hospital to justify the financial risk referred to, as the existing Asile Evangélique at Nice, with thirty-eight beds, takes in Protestant patients of all nationalities. The Asile is managed by a committee, of which the President and half the members are English; it owns a Victoria Ward in commemoration of the Diamond Jubilee; and has been visited by many members of the Royal family. For surgical cases at Nice there is the new hospital built by Prince d'Essling, and for poor English Jews there is the well-managed Jewish hospital at Cimiez. The only real need seems to be for the few cases of illness amongst poor Anglo-Saxon Roman Catholics, and this might be met at less expense than the starting of a new hospital. Another great objection to the Victoria Memorial Hospital scheme is the growing difficulty with which English and American doctors obtain permission from the Government of France to practise their profession in that country. In the face of these facts, it seems likely that the Riviera Victoria Memorial may take some form less ambitious and more likely to do permanent good, unless some British philanthropist will establish the hospital scheme on a firm business basis by the gift of, at least, 5,000*l*.

### TOWER OF BIRKENHEAD TOWN HALL.

ON the 17th inst. a special meeting of the Birkenhead Town Council was held. It was proposed that Mr. Henry Hartley, of Liverpool, be appointed architect in connection with the reconstruction of the town hall tower. Mr. G. P. Snape said that he thought a good deal of money had been lost over the tower, and he desired to know now whether it was intended to alter the original design of the tower. He also asked what the tower had cost up to the present. Mr. Robinson replied that the approximate cost up to the present was a little over 700*l*. With regard to the design, they asked for the appointment of an architect who would submit plans to them. They wished the architect to have an entirely free hand, and the committee were not biassed in any way. The Council for the purpose of discussion then went into committee. In reply to Mr. A. E. Grice, Mr. Robinson said there was a feeling in committee that a modification of the old tower would be desirable, but there was a unanimous feeling that the clock part of the tower should be retained. Mr. E. A. Tooth suggested that competitive designs should be submitted; they had good architects in Birkenhead, and they might be given a chance. Mr. Robinson said Mr. Hartley was the unanimous recommendation of the committee; while as to the suggestion of competitive designs there would be a further waste of time. Further, Mr. Hartley superintended the pulling-down of the tower, a highly technical and dangerous work, which was carried out most satisfactorily. Several others having spoken, Mr. Robinson replied to the whole discussion. He said the finance committee wanted to first appoint an architect, then get the design and estimate, and then this would be submitted to the Council. Mr. Snape moved that the recommendation be referred back in order that the Council might have a fuller report with expert advice in the matter. Mr. Tooth seconded. The amendment was defeated, and the proceedings were confirmed.

### UNDERGROUND WATER PRESERVATION ASSOCIATION.

THIS Association, which was the Kent Water Preservation Association, has been formed for the purpose of preventing the abstraction of water by water companies to the detriment of landowners, millowners, householders and others, and for conserving the waters of any district when they are required for the use of its own inhabitants. It is stated that for many years certain geologists imagined the London basin to be composed of a series of chalk beds under the London clay, and these beds were supposed to be full of water and practically inexhaustible. But facts now derived from regions in or near that basin show that this is not the case, and that in many cases the water is rapidly becoming exhausted. This deficiency has been almost universally attributed to lack of rain, but one of the objects of the compilers of this pamphlet is to show another cause of what has already become a very disastrous state of affairs in the home counties and in many other parts of the country. The report drawn up by Mr. Urban H. Smith, C.E., on this subject refers to the disastrous results of depletion of the springs by pumping. Among the chief objects of this Association the following are given:—(1) To suggest the best

course to be adopted for preserving the water supply under the special circumstances of any particular case; (2) to suggest the best position for locating pumping stations with a view of doing as little injury as possible to local interests; (3) to suggest the best course to be adopted in storing for domestic purposes, the ordinary rainfall; and (4) to take all possible steps to prevent water companies from obtaining money and powers from Parliament for the erection of pumping stations in districts where there is a shortage of water, and where such pumping operations threaten to deprive the inhabitants of the district of their natural supply.

### GENERAL.

**M. Stanislas Meunier**, the French geologist, has reported to the Académie des Sciences that a volcano, as yet inactive, exists beneath the Boulevard St. Martin and the Place de la République, Paris.

**The Prince of Wales** has forwarded 10*l*. to a fund which is being raised for the restoration of the parish church of Wymondham, Norfolk.

**M. Josef Israels**, the Dutch painter, has been elected a foreign associate of the Académie des Beaux-Arts in succession to the late Marc Antocolsky of St. Petersburg.

**The Proposed Monument** to Dante in Rome will cost 40,000*l*.

**M. Emile Ulmann**, the French architect, has died in Paris in his fifty-eighth year. He obtained the Prix de Rome in 1871 and in 1896 was awarded the medal for domestic architecture.

**Mr. Thomas Brock, R.A.**, has been commissioned to execute the Nicholson memorial statue which is to be erected at Delhi.

**The Director** of the French School at Athens has been reappointed by his Government for a fresh period of six years.

**The Earl of Rosebery** has accepted the presidency of the Buckinghamshire Architectural and Archæological Society.

**The Statue of James II.** which used to stand in Whitehall Gardens, and afterwards on the south-east side of Whitehall, is to be again set up, but the position has not been determined. The statue is generally accepted as the work of Grinling Gibbons.

**Mr. G. R. Macdougall**, of New York, has presented a sea picture by Mr. John Wilson, R.S.A., to the Scottish National Gallery at Edinburgh.

**The Temporary Footways** at London Bridge have been subjected during several days past to extreme tests by means of waggons of cut stone, engines, cranes, &c., and it is expected that in a few days the footways will be available for public use.

**The Seine General Council** have agreed to issue a loan of 180,000,000 frs. for public works, the principal of these being the extension to St. Germain of the avenue from the Arc de l'Etoile to Courbevoie.

**The Record** of the year's meetings and excursions by the archæologists of the Upper Norwood Athenæum has been published. The papers have appeared in *The Architect*. During 1901-2 the region explored has been expanded. The self-reliant efforts of the committee to popularise archæology deserve encouragement. The volumes of the record will form an interesting addition to most libraries.

**The Sedgley School Board** have approved the designs of Mr. S. H. Eachus, architect, of Wolverhampton, for a new school to accommodate 350 girls, as well as designs for a cookery and laundry centre, a caretaker's house and for the rearrangement of the present school at Mount Pleasant.

**The Discovery** of extensive beds of potters' clay of excellent quality on the Silverton estate, near Pretoria, Transvaal, is likely to lead to the local manufacture of pottery, porcelain and such like ware. The matter has been taken in hand by certain enterprising residents with the view of starting the manufacture on a proper scale, information which is worth noting by firms interested in supplying the necessary plant.

**The Memorial** to Queen Victoria in Whippingham Church, which takes the form of rich ornamentation and enlargement of the sanctuary, was dedicated on Tuesday morning by a special service, conducted by the rector, Canon Clement Smith.

**The Technical Instruction Committee** of the Blackpool Town Council have decided to offer premiums of 60*l*., 25*l*. and 15*l*. for the best designs for a school to be erected on the Raikes Hall site. The scheme will include a lecture hall to seat some 400 persons, and all the requirements of a technical as well as of a secondary school are to be provided for.



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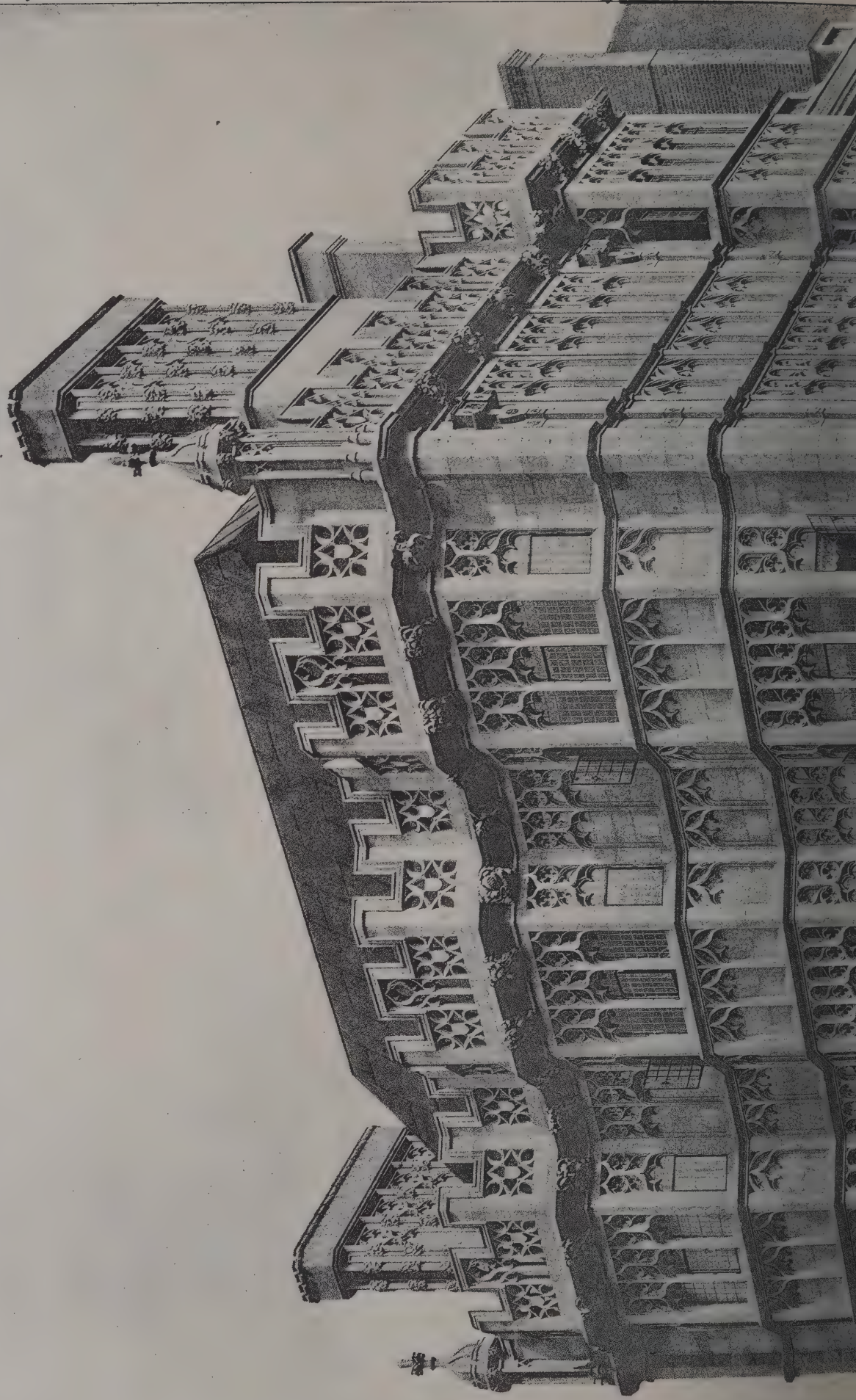




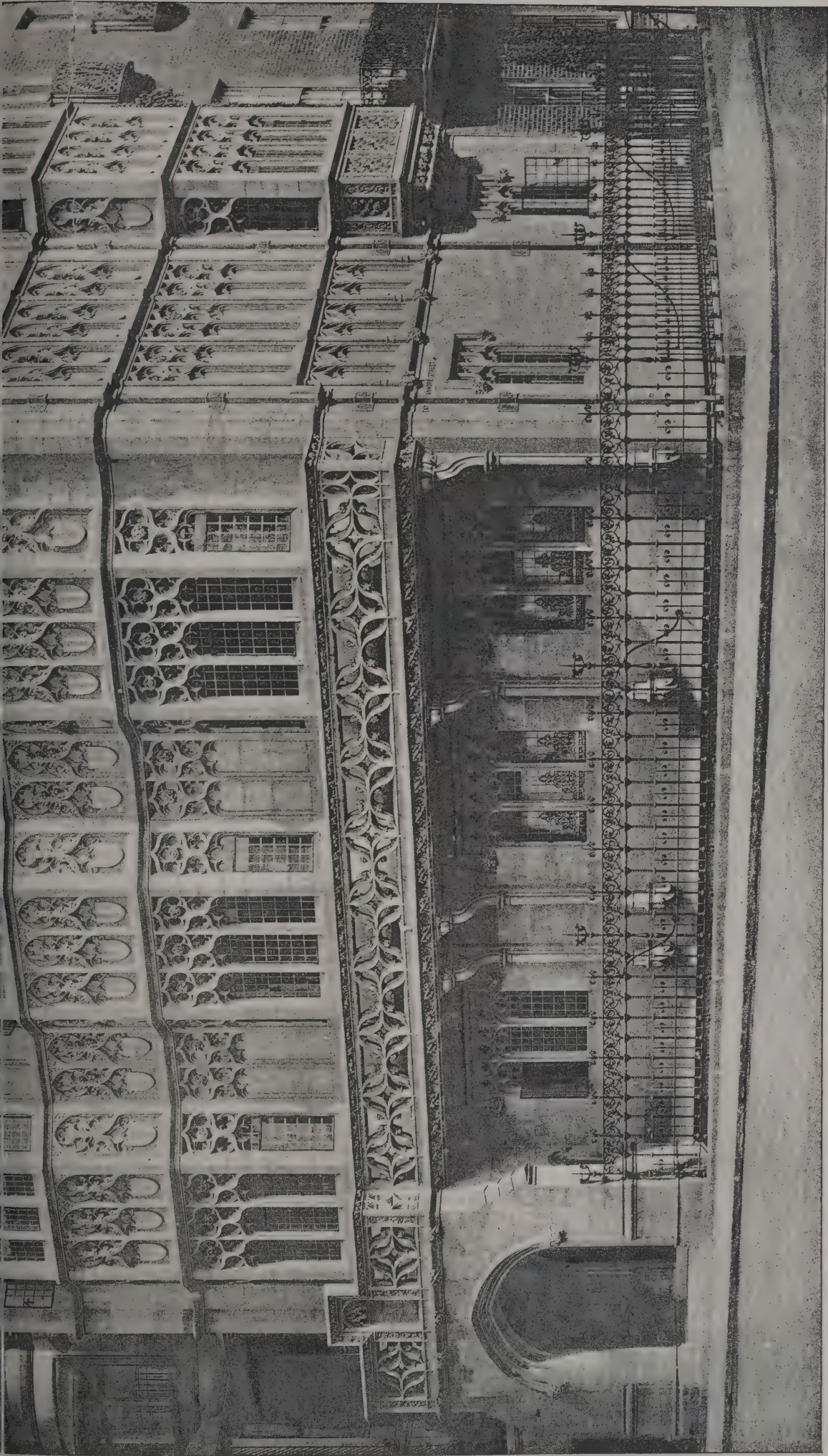




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THE

## Architect and Contract Reporter.

## EDITORIAL NOTICES.

*In view of the many difficulties which are certain to arise in connection with the law, practice rules and procedure under the Workmen's Compensation Act, we have added to our staff A VERY EMINENT BARRISTER, who has made the subject a special study, and will be glad to answer in the columns of this paper any questions relating to the complicated matters arising from the provisions of this difficult Act. Our LEGAL ADVISER will further answer any legal question that may be of interest to our readers. All letters must be addressed "LEGAL ADVISER," Office of "The Architect," Imperial Buildings, Ludgate Circus, London, E.C.*

*The Editor will be glad to receive from Architects in London and the Provinces results of Competitions and Tenders and other particulars of Works in progress in which they may be interested.*

*The authors of signed articles and papers read in public must necessarily be held responsible for their contents.*

*No communication can be inserted unless authenticated by the name and address of the writer—not in every case for publication, but as a guarantee of good faith.*

*Correspondents are requested to make their communications as brief as possible. The space we can devote to Correspondence will not usually permit our inserting lengthy communications.*

## TENDERS, ETC.

*\*\* As great disappointment is frequently expressed at the non-appearance of Contracts Open, Tenders, &c., it is particularly requested that information of this description be forwarded to the Office, Imperial Buildings, Ludgate Circus, London, E.C., not later than 2 P.M. on Thursdays.*

## COMPETITIONS OPEN.

ASHTON-IN-MAKERFIELD.—Dec. 31.—Designs, &c., are invited for the enlargement of the Infectious Diseases Hospital. The architect whose plans are accepted and approved will be retained by the Council to carry out the work at the usual professional charges. Plan of the hospital site, together with full particulars of the alterations and extensions required, may be obtained from Mr. T. Burgess, surveyor, at the Council Offices.

BRIDGWATER.—Feb. 28.—Plans, specifications and estimates are invited in competition for power and appliances to deal with the accumulations of silt in portions of the river Parrett. Mr. W. T. Baker, town clerk, King Square, Bridgewater.

CAPE TOWN.—Jan. 31.—The Council of the University of the Cape of Good Hope invite designs for the erection of university buildings. Premiums of 400*l.*, 200*l.* and 100*l.* will be awarded to the authors of the designs placed first, second and third respectively. Particulars of the competition may be obtained on application to the Registrar at Cape Town, or to the Agent-General in London.

HULL.—Mar. 31.—Designs in competition are invited for the extension of the town hall. Premiums of 300*l.*, 200*l.* and 100*l.* are offered. Mr. E. Laverack, town clerk, Town Hall, Hull.

KINGSTON-ON-THAMES.—Jan. 15.—Plans and designs are invited for a central home and cottage homes for children of both sexes in the Kingston Road, in the parish of New Malden. A premium for the first three selected plans of 25*l.*, 15*l.* and 10*l.* respectively is offered. Mr. Jas. Edgell, clerk, Union Offices, Coombe Lane, Kingston-on-Thames.

ST. IVES, CORNWALL.—Jan. 31.—Competitive plans are invited for the erection of municipal buildings, to consist of a guildhall, council-chamber, jury room, public hall, town clerk's office, surveyor's office, treasurer's office, muniment room, parochial office, mayor's parlour and fire-brigade station and offices. Premiums of 70*l.* and 30*l.* respectively will be awarded to the architects whose plans and specifications are considered to be first and second in order of merit. Mr. Edward Boase, town clerk, Town Clerk's Office, St. Ives, Cornwall.

SUTTON COLDFIELD.—Feb. 20.—Designs are invited for the erection of a town hall adjoining the council house, the total expenditure to be limited to 7,000*l.* Premiums of 50*l.*, 30*l.* and 20*l.* respectively will be awarded for the three best designs in order of merit. Mr. W. A. Clarry, C.E., borough surveyor, Council House, Sutton Coldfield.

## CONTRACTS OPEN.

BETHNAL GREEN.—Jan. 5.—For erection of dormitories maternity wards and other buildings at Waterloo Road workhouse, Bishop's Road, Victoria Park, N.E. Mr. W. A. Finch, architect, 76 Finsbury Pavement, E.C.

BOOTLE.—Jan. 2.—For erection of superstructure of a school for 1,000 children, Linacre Lane, Bootle, Lancs. Mr. Thomas Cox, architect, 11 Dale Street, Liverpool.

BRIDLINGTON.—Jan. 3.—For erection of new terrace steps and alteration of the present steps at Bridlington grammar school. Mr. John Woodmansey, secretary to the Governors, 24 Cambridge Street, Bridlington.

BRISTOL.—Dec. 31.—For second instalment of the superstructure of the Avonbank electricity works, Feeder Road, comprising steelwork, masonry, concrete, &c. Mr. H. Faraday Proctor, city electrical engineer, Temple Back, Bristol.

DORKING.—Dec. 31.—For alterations and repairs at the workhouse. Mr. William Shearburn, architect, South Street, Dorking.

DURHAM.—Jan. 5.—For erection of new Board schools at Heworth. Mr. H. Miller, architect, Felling.

ESSEX.—Jan. 7.—For erection of the Carnegie free library at Grays, Essex, and for furnishing, lighting and heating the same. Mr. Christopher M. Shiner, architect, 6, 7 and 8 Crutched Friars, E.C.

GOOLE.—Dec. 30.—For erection of a mortuary chapel at Swinefleet. Mr. H. B. Thorp, architect, Goole.

GRASMERE.—Jan. 3.—For rebuilding Goody Bridge, Grasmere, Westmorland. Mr. J. Bintley, 7 Lowther Street, Kendal.

GREAT AYTON.—Dec. 29.—For erection of proposed new police-station, &c., at Great Ayton, Yorks. Mr. Walter H. Brierley, county architect, 13 Lendal, York.

HASLINGDEN.—For erection of brick chimney, Messrs. Nicholas, Tomlinson & Sons, Plantation Mill, Haslingden.

HAVERHILL.—Jan. 3.—For rebuilding Melborn Bridge, Haverhill, Suffolk. Mr. A. Ainsworth Hunt, county architect, Sudbury.

HULL.—Dec. 24.—For alterations and additions to 39 and 40 Prospect Street, Hull. Mr. B. S. Jacobs, architect, Lincoln's Inn Buildings, Bowl Alley Lane, Hull.

## FRED VERITY & SON'S SKYLIGHTS WITH PATENT LIFTERS.

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Fig. 9.



**HULL.**—Dec. 31.—For erection of thirty-four artisans' dwellings in Rustenburgh Street. Mr. Joseph H. Hirst, city architect, Town Hall, Hull.

**IRELAND.**—Jan. 1.—For erection of priest's house at Glenville, co. Cork. Mr. Samuel F. Hynes, architect, 21 South Mall, Cork.

**IRELAND.**—Jan. 6.—For erection of cottages in the various townlands of Strabane. Mr. J. E. Sharkie, clerk, District Council Offices, Strabane.

**IRELAND.**—Dec. 31.—For erection of twenty-seven labourers' dwellings as follows:—Twenty-three cottages at Howth, three cottages at Maynetown, and one cottage at Killester, Dublin. Mr. John O'Neill, clerk, North Brunswick Street, Dublin.

**JARROW.**—Dec. 29.—For alterations and additions to the Dunn Street school. Mr. T. H. Spencer, clerk, U.D. School Board, Jarrow.

**KESWICK.**—For erection of a house at Keswick. Mr. Henry A. Cheers, architect, Twickenham.

**LEYTONSTONE.**—Jan. 5.—For erection of Norlington Road schools, Leytonstone, Essex. Mr. William Jacques, architect, 2 Fen Court, Fenchurch Street, E.C.

**MANCHESTER.**—Jan. 7.—For putting-in the foundations of the proposed chief fire station and police station in London Road, Fairfield Street, Whitworth Street and Commerce Street. Mr. William Windsor, surveyor, 37 Brown Street, Manchester.

**NORTHWICH.**—Jan. 6.—For extension of the Victoria Infirmary, Northwich, consisting of ward accommodation for twenty-two beds, operating theatre and other offices. Mr. J. Holland, architect, Hayhurst Street, Northwich.

**RHODESIA.**—Feb. 26.—For establishment and working of an electric tramway system, Bulawayo. Messrs. Davis & Soper, 54 St. Mary Axe, London, E.C.

**SALE.**—Dec. 30.—For street works in the following roads:—Baxter Road, tar macadam; Oldfield Road, ordinary macadam; Lynwood Grove, ordinary macadam; Stanley Grove, sett paving. Mr. W. Holt, surveyor, Council Offices, Sale.

**SCOTLAND.**—Dec. 27.—For additions to Invercauld Arms hotel, Braemar. Messrs. Jenkins & Marr, architects, 16 Bridge Street, Aberdeen.

**SCOTLAND.**—Jan. 19.—For erection of new station buildings at Wemyss Bay and Inverkip. Mr. J. Blackburn, secretary, Caledonian Railway Company, 302 Buchanan Street, Glasgow.

**TEIGNMOUTH.**—Jan. 6.—For extensions and alterations at the gasworks. Mr. J. Alex. Gray, gas engineer, Teignmouth.

**TROWBRIDGE.**—Jan. 5.—For erection of an isolation hospital for thirty patients at Trowbridge, Wilts. Mr. J. Hugh Goodman, architect, Town Hall Chambers, Reading.

**WALES.**—Dec. 28.—For erection of twenty-five houses at Pengam. Mr. David Williams, Board schools, Pengam.

**WALES.**—Dec. 28.—For erection of house and shop at Gwain-cae Gurwain, near Brynamman. Mr. Bartholomew, architect, Greenville House, Brynamman.

**WALES.**—Dec. 31.—For erection of new business premises at the corner of Alexandra Road and Terrace Road (opposite the railway station), Aberystwyth. Mr. J. Arthur Jones, architect, 7 Queen's Terrace, Aberystwyth.

**WALES.**—Jan. 5.—For erection of ninety-five cottages at Aber, near Caerphilly. Mr. E. Thomas, 19 Eirw Road, Porth.

**WALES.**—Jan. 5.—For erection of ninety-five cottages at Abertridwr, near Caerphilly. Mr. Edmund Thomas, 19 Eirw Road, Porth, Pontypridd.

**WATER FULFORD.**—Dec. 31.—For erection of a lunatic asylum at Water Fulford, near the city of York. Mr. A. Creer, architect, Guildhall, York.

**WHITEHAVEN.**—Dec. 24.—For erection of two semi-detached houses at Hensingham. Mr. A. Huddart, architect, 22 Lowther Street, Whitehaven.

**WIGAN.**—Dec. 27.—For erection of fourteen cottages in Ellis Street and eleven in Eckersley Street, off Whalley. Mr. Harold Jevons, town clerk, Municipal Buildings, Wigan.

**YORK.**—Dec. 31.—For erection of a lunatic asylum at Water Fulford, near the city of York. Mr. A. Creer, architect, Guildhall, York.

A NEW Congregational mission hall at Vickerstown, Walney Island, which has been erected on a site given by Messrs. Vickers, Sons & Maxim, is now open. The hall will accommodate 150.

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For erection of underground convenience, steps and retaining walls to open space at the junction of Sunbridge Road and Southgate, Bradford.

*Accepted tenders.*

©. Booth & Son, Great Horton, Bradford, excavator, mason and bricklayer.

S. Thirkhill, Walker Court, East Bowling, Bradford, joiner.

G. Jackson, 48A Gaythorne Road, Bradford, plumber and glazier.

W. & E. Mitchell, Idle, Bradford, plasterer and concreter.

F. Fox, Sackville Street, Bradford, ironfounder and smith.

For supply of retorts and of firebricks and fireclay required in the fixing of such retorts during year 1903.

J. MORTON & Co., Bradford (*accepted*).

For erection of proposed district baths, Drummond Road, Bradford.

*Accepted tenders.*

M. Booth & Sons, excavator, mason and bricklayer.

B. Sugden & Sons, concreter.

J. Copley, carpenter and joiner.

R. H. Dewhirst, smith and ironfounder.

S. Rushworth, plumber and glazier.

B. Sugden & Sons, plasterer.

Hill & Nelson, slater.

F. Copley, painter.

**GREAT YARMOUTH.**

For erection of girls' home at The Hollies, Gorleston. Mr.

WALTER LAKE, architect, Regent Street, Great Yarmouth.

Carter & Wright . . . . . £1,006 0 0

J. W. Bray . . . . . 938 0 0

W. Howes . . . . . 920 0 0

Jary . . . . . 880 0 0

Everitt . . . . . 875 0 0

F. Cockrell . . . . . 872 10 0

Smith Bros. . . . . 805 0 0

A. E. Bond . . . . . 799 0 0

MOORE & SONS, Great Yarmouth (*accepted*) . . . . . 787 0 0

**HERNE BAY.**

For erection of pavilion, band-stand, reading-rooms, lavatories, &c., at East Cliff, Herne Bay. Mr. F. W. J. PALMER, surveyor to the Council, architect. Quantities by Messrs. GARDINER & THEOBALD, 110 Great Russell Street, Bedford Square.

Paramor & Sons . . . . . £5,200 0 0

W. Martin . . . . . 5,139 0 0

L. Seager . . . . . 4,997 0 0

Denne & Son . . . . . 4,990 0 0

Turner & Co. . . . . 4,899 0 0

W. J. Adcock . . . . . 4,895 0 0

C. W. Welby . . . . . 4,889 0 0

G. Chesswas . . . . . 4,875 5 6

E. T. J. Adams . . . . . 4,599 0 0

A. S. Ingleton . . . . . 4,487 0 0

Gann & Co. . . . . 4,345 0 0

**IRELAND.**

For erecting an ornamental wooden shelter on the Esplanade, Bangor, co. Down. Mr. E. L. WOODS, C.E., architect.

J. Colville . . . . . £128 19 0

For sewerage works in Barrack Lane, Skerries, Balrothery.

T. HEENEY, Balbriggan (*accepted*) . . . . . £124 0 0

**LAMBETH.**

For alterations at 112 Westminster Bridge Road, S.E.

R. Harding & Sons . . . . . £130 0 0

H. Hussey . . . . . 112 1 0

J. Haydon . . . . . 98 10 0

T. Pearce . . . . . 97 17 0

W. Fitch . . . . . 96 0 0

E. Mills . . . . . 95 0 0

J. Shelbourne & Co. . . . . 95 0 0

Davis & Clayton . . . . . 91 0 0

H. Kent . . . . . 90 0 0

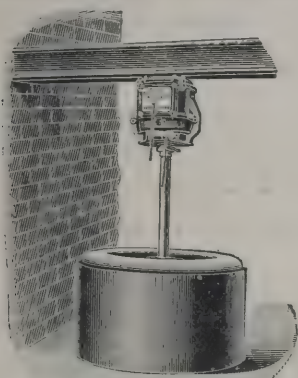
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H. Bragg & Sons . . . . . 79 0 0

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For providing and erecting a fire-escape staircase at the union workhouse.

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For erection of a dust destructor at the Gore Farm Hospital:

Heenan & Froude, Ltd.	£1,250	0	0
Meldrum Bros., Ltd.	325	0	0
T. Smart	300	0	0
Universal Engineering Co.	298	0	0
Refuse Destructors, Ltd.	280	10	0
Manlove, Alliott & Co.	275	0	0
R. H. B. Neal	244	0	0
W. F. Mason, Ltd.	225	18	3
W. F. Blay	180	0	0
J. & F. Wilson	176	8	8
Enness Bros.	175	0	0
J. Lonsdale	150	0	0
GARDNER & HAZELL, 84 Canonbury Road, Islington, N. (accepted)	135	0	0
Radford & Greaves	83	10	0
G. Chesswass	58	10	0

## LONDON SCHOOL BOARD.

For accommodation—boys, 380; girls, 380; infants, 382—total, 1,142, New School, Grange Hill Road.

Lathey Bros.	£28,647	0	0
F. & H. F. Higgs	28,532	0	0
J. Greenwood	28,147	0	0
W. Johnson & Co., Ltd.	27,992	0	0
W. H. Lorden & Son	27,888	0	0
L. H. & R. Roberts	27,812	0	0
G. Munday & Sons	27,777	0	0
W. Downs	27,301	0	0
E. Lawrance & Sons	27,017	0	0
McCormick & Sons	26,708	0	0
J. Garrett & Son	26,642	0	0
G. E. Wallis & Sons	26,487	0	0
J. Smith & Sons, Ltd.	26,297	0	0
Treasure & Son	25,996	0	0
J. Marsland & Sons	25,942	0	0
J. & C. Bowyer	25,878	0	0
Stimpson & Co.	25,440	0	0
J. & M. Patrick,* London and Rochester	24,142	0	0

\* Recommended for acceptance.

## LONDON SCHOOL BOARD—continued.

For enlargement—boys, 100; girls, 100; infants, 100; total, 300, New Park Road.

Leslie & Co., Ltd.	£4,614	0	0
W. Smith & Son	4,547	0	0
W. Johnson & Co., Ltd.	4,480	0	0
J. Marsland & Sons	4,456	0	0
J. Garrett & Sons	4,390	0	0
F. & H. F. Higgs	4,366	0	0
Martin Wells & Co., Ltd.	4,322	0	0
E. P. Bulled & Co.	4,261	0	0
E. Triggs	4,261	0	0
J. Appleby	4,250	0	0
Lathey Bros.	4,205	0	0
W. J. Mitchell & Son	4,171	0	0
Rice & Son	3,995	0	0
Johnson & Co.*	3,861	0	0

For providing new offices for both departments and altering the position of coal store in connection with same; also providing oak fencing to form separate playgrounds, Galleywall Road (special school).

T. L. Green	£527	0	0
W. Downs	458	0	0
J. Appleby	425	0	0
H. Groves	425	0	0
J. Garrett & Son	401	0	0
Belcher & Co., Ltd.	385	0	0
J. C. Chalkey*	319	0	0

For providing glazed partition to divide classroom C, and reversing stepped flooring in one of these rooms for left light, including bricking-up fireplaces and providing open portable stoves and new flues and stack in connection with same, for warming the redivided rooms in each case, Alverton Street (boys and girls).

H. Line, schedule prices (1902) + 15 per cent.			
Maxwell Bros, Ltd.	£495	0	0
T. D. Leng	430	0	0
W. Downs	391	0	0
W. V. Goad	384	0	0
J. Marsland & Sons	373	0	0
W. Akers & Co.	337	0	0
H. Groves	318	0	0
G. KEMP (accepted)	285	0	0

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H. Wall & Co. . . . .	1,079	0	0
Marchant & Hirst . . . . .	1,072	0	0
Treasure & Son . . . . .	1,062	0	0
Perry & Co. . . . .	1,043	0	0
W. Gregar & Son . . . . .	1,042	0	0
W. Shurmur & Sons, Ltd. . . . .	999	0	0
E. Lawrance & Sons . . . . .	997	0	0
Clarke & Bracey . . . . .	978	0	0
Staines & Son . . . . .	975	0	0
J. Willmott & Sons . . . . .	945	2	0
W. King & Son . . . . .	937	0	0
C. Cox . . . . .	885	0	0
F. & F. J. Wood . . . . .	877	0	0
Lathey Bros.* . . . .	793	0	0

\* Recommended for acceptance.

For removing present lath-and-plaster partition, and providing two new sliding glazed partitions in order to divide classrooms B and C into three rooms; providing an open-fire stove for warming the middle room and constructing a brick flue in connection with same; also providing a skylight for improving light in middle room, Rendlesham Road (S.M.).

London School Furniture Co. . . . .	£395	0	0
J. Grover & Son . . . . .	296	0	0
Barrett & Power . . . . .	280	0	0
W. Shurmur & Sons, Ltd. . . . .	279	0	0
F. & F. J. Wood . . . . .	279	0	0
W. Martin . . . . .	261	10	0
STEVENS BROS. (accepted) . . . . .	249	10	0

For glazed partition to divide classroom R and constructing new fireplace to warm one of the divided rooms; also providing six ventilating skylights, viz., to classrooms, I, K, M, N, P, Q, Old Castle Street (mixed).

Unsigned . . . . .	£496	0	0
G. Barker . . . . .	420	0	0
Johnson & Co. . . . .	395	0	0
A. J. SHEFFIELD (accepted) . . . . .	305	0	0

## LONDON SCHOOL BOARD—continued.

The interiors of the following schools will be cleaned between December 13, 1902, and January 3, 1903, and the exteriors of the schools marked † will be painted between April 4 and May 2, 1903.

## Brackenbury Road.

G. H. Sealy . . . . .	£311	10	0
G. Neal . . . . .	295	0	0
S. Polden . . . . .	291	15	0
F. T. Chinchin & Co. . . . .	286	15	0
W. R. & A. Hide . . . . .	271	0	0
F. CHIDLEY (accepted) . . . . .	256	6	1
Bristow & Eatwell . . . . .	219	0	0

## Mantle Road.

H. Leney & Son . . . . .	£290	0	0
T. D. Leng . . . . .	229	0	0
J. & C. Bowyer . . . . .	225	0	0
C. G. Jones . . . . .	213	6	0
A. Black & Son . . . . .	209	0	0
W. J. Howie . . . . .	208	0	0
G. Kemp . . . . .	190	0	0
H. GROVES (accepted) . . . . .	185	0	0

## Mulgrave Place.

E. Proctor . . . . .	£208	0	0
W. Banks . . . . .	170	0	0
W. Hayter & Son . . . . .	170	0	0
Holliday & Greenwood, Ltd. . . . .	164	0	0
W. J. HOWIE (accepted) . . . . .	149	0	0

## Plassy Road.

A. Black & Son . . . . .	£262	0	0
J. & C. Bowyer . . . . .	259	0	0
W. Hayter & Son . . . . .	259	0	0
J. & M. Patrick . . . . .	234	0	0
H. Groves . . . . .	212	0	0
G. Kemp . . . . .	210	0	0
C. G. Jones . . . . .	205	5	0
W. BANKS (accepted) . . . . .	199	17	6

## Droop Street

G. H. Sealy . . . . .	£263	10	0
H. C. Clifton . . . . .	236	0	0
W. Chappell . . . . .	175	0	0
F. Chidley . . . . .	165	0	0
F. T. CHINCHIN & Co. (accepted) . . . . .	149	5	0
Bristow & Eatwell . . . . .	137	17	0

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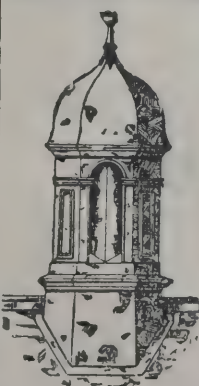
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ENGINEERS,  
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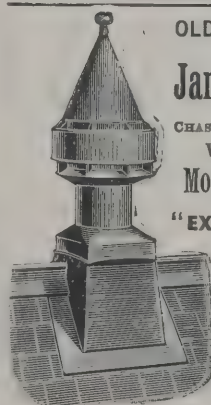
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application.

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Courses.

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Every description of Asphalte laid and supplied.

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LONDON, S.E.**



## LONDON SCHOOL BOARD—continued.

*Ellerslie Road.*

G. H. Sealy . . . . .	£254	10	0
G. Neal . . . . .	225	0	0
S. Polden . . . . .	195	10	0
W. R. & A. HIDE (accepted) . . . . .	188	10	0
F. Chidley . . . . .	180	3	0
Bristow & Eatwell . . . . .	153	0	0

*Plum Lane (iron buildings).*

W. Hayter & Son . . . . .	£75	0	0
J. Smith & Sons, Ltd. . . . .	53	0	0
J. H. Hodgkin . . . . .	49	10	0
E. PROCTOR (accepted) . . . . .	40	0	0

*Enfield Road.*

J. Grover & Son . . . . .	£397	0	0
McCormick & Sons . . . . .	346	0	0
Viney & Stone . . . . .	307	0	0
Marchant & Hirst . . . . .	247	0	0
G. Wales . . . . .	229	0	0
Stevens Bros. . . . .	226	0	0
G. BARKER (accepted) . . . . .	224	0	0

*St. Clement's Boys, Girls, Infants' and Special.†*

G. H. Sealy . . . . .	£585	5	0
General Builders, Ltd. . . . .	496	0	0
S. Polden . . . . .	396	0	0
W. Chappell . . . . .	385	0	0
W. R. & A. Hide . . . . .	362	0	0
F. T. Chinchin & Co. . . . .	349	14	0
BRISTOW & EATWELL (accepted) . . . . .	311	10	0

*Chequer Street (old portion).*

Johnson & Co. . . . .	£100	0	0
W. Chappell . . . . .	95	0	0
Stevens Bros. . . . .	78	0	0
Belcher & Co., Ltd. . . . .	72	10	0
GAVIN BROS. (accepted) . . . . .	70	18	0

*Grafton Road.†*

Bate Bros . . . . .	£509	0	0
C. Dearing & Son . . . . .	458	0	0
McCormick & Sons . . . . .	454	0	0
Marchant & Hirst . . . . .	403	0	0
C. & W. Hunnings . . . . .	400	18	6
STEVENS BROS. (accepted) . . . . .	339	0	0

## LONDON SCHOOL BOARD—continued.

*Bloomfield Road (clean interiors boys and girls' and paint interiors of junior mixed and infants' schools).†*

W. Hayter & Son . . . . .	£635	0	0
H. Groves . . . . .	503	0	0
W. Banks . . . . .	495	15	6
G. Kemp . . . . .	450	0	0
E. PROCTOR (accepted) . . . . .	435	0	0

*Dalmain Road.†*

H. & G. Mallett . . . . .	£553	17	0
J. & M. Patrick . . . . .	498	0	0
J. & C. Bowyer . . . . .	468	0	0
G. Kemp . . . . .	385	0	0
C. G. JONES (accepted) . . . . .	328	11	0

*Hither Green.*

W. Hornett . . . . .	£241	10	0
J. & C. Bowyer . . . . .	225	0	0
T. D. Leng . . . . .	218	0	0
H. Groves . . . . .	194	0	0
W. Hayter & Son . . . . .	194	0	0
W. Banks . . . . .	193	10	0
C. G. JONES (accepted) . . . . .	191	0	0

*Gainsborough Road.†*

D. Gibb & Son . . . . .	£489	0	0
J. Chessum & Sons . . . . .	450	0	0
G. Barker . . . . .	440	0	0
Corfield & Co. . . . .	436	0	0
A. W. Derby . . . . .	425	0	0
W. Silk & Son . . . . .	423	0	0
VIGOR & CO. (accepted) . . . . .	386	10	0

*Hugon Road.*

Green & Twilley . . . . .	£364	0	0
W. H. Lorden & Son . . . . .	333	15	0
W. Hammond . . . . .	295	10	0
E. Flood . . . . .	250	0	0
Lathey Bros. . . . .	247	0	0
C. GURLING (accepted) . . . . .	242	10	0

*North End Road.*

W. Hammond . . . . .	£311	0	0
Holloway Bros., Ltd. . . . .	229	0	0
W. HORNETT (accepted) . . . . .	196	10	0
Bristow & Eatwell . . . . .	177	10	0

# HAM HILL STONE. DOULTING STONE.

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WATER-PROOF. ROT-PROOF.  
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For UNDERLINING Slates, Tiles, Iron Buildings, with or without Boards. For LAYING ON JOISTS. Placed under Floor Boards EXCLUDES DAMP AND DEADENS SOUND. Also for Damp Walls.

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**D. WITT & COMPANY, 168 TO 176 DRUMMOND STREET, N.W.**  
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## LONDON SCHOOL BOARD—continued.

*Hindle Street.*

C. & W. Hunnings	£272	10	0
J. Grover & Son	242	0	0
Corfield & Co.	230	10	0
G. Barker	220	17	6
BARRETT & POWER (accepted)	197	0	0

*Homerton Row* (clean interior of old portion and paint interior of enlargement).

Corfield & Co.	£431	10	0
Collis Willmott & Son	411	10	0
W. Shurmur & Sons, Ltd.	410	0	0
A. W. Derby	396	0	0
J. Grover & Son	378	0	0
W. Silk & Son	370	0	0
J. Chessum & Sons	340	0	0
G. BARKER (accepted)	311	0	0
Vigor & Co.	307	0	0

*Millfields Road* (clean interior of main building and paint interior of new centres).

J. Stewart	£374	5	0
W. Silk & Son	366	0	0
McCormick & Sons	365	0	0
Stevens Bros.	322	0	0
G. WALES (accepted)	309	0	0

*Penrose Street* (old portion).

W. V. Goad	226	0	0
W. Sayer & Son	212	17	0
Johnson & Co.	206	0	0
Maxwell Bros., Ltd.	189	0	0
J. C. CHALKLEY (accepted)	165	0	0

*Hugh Myddelton.*

J. Smith & Sons, Ltd.	£890	0	0
Lathey Bros.	710	0	0
McCormick & Sons	692	0	0
Marchant & Hirst	646	0	0
Johnson & Co.	619	0	0
C. & W. Hunnings	609	0	0
G. S. S. Williams & Son	604	0	0
A. W. Derby	602	0	0
STEVENS BROS. (accepted)	584	10	0

## LONDON SCHOOL BOARD—continued.

*Roman Road.*

Viney & Stone	£477	0	0
A. W. Derby	425	0	0
A. J. Sheffield	409	0	0
W. Silk & Son	405	10	0
T. S. Elkington & Sons	379	10	0
VIGOR & CO. (accepted)	357	10	0

*Yerbury Road.*

Bate Bros.	£387	0	0
McCormick & Sons	380	0	0
C. & W. Hunnings	361	14	0
Marchant & Hirst	296	0	0
Stevens Bros.	272	0	0
C. DEARING & SON (accepted)	255	0	0

*Church Street.* †

J. F. Ford	310	0	0
Rice & Son	305	0	0
W. H. Lorden & Son	255	15	0
H. & G. MALLETT (accepted)	250	5	0

*Eardley Road.*

W. Johnson & Co., Ltd.	£247	0	0
H. Leney & Son	243	0	0
J. & C. Bowyer	196	0	0
Hudson Bros.	177	0	0
W. H. Lorden & Son	166	15	0
E. P. BULLED & CO. (accepted)	137	0	0

*Marner Street.*

Turnbull & Son	£448	0	0
D. Gibb & Co.	219	0	0
J. F. Holliday	218	0	0
A. W. Derby	193	0	0
Vigor & Co.	189	10	0
A. J. SHEFFIELD (accepted)	180	0	0

*Gill Street.*

A. E. Symes	£267	0	0
A. J. Sheffield	187	0	0
A. W. Derby	167	0	0
Barrett & Power	160	0	0
D. Gibb & Co.	154	0	0
Vigor & Co.	147	0	0
J. HAYDON & SONS (accepted)	127	10	0

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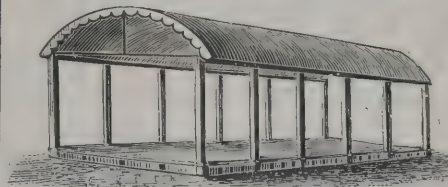
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## LONDON SCHOOL BOARD—continued.

## Eltringham Street.

Green & Twilley . . . . .	£410	0	0
R. S. Ronald . . . . .	365	0	0
W. Hornett . . . . .	309	0	0
E. Triggs . . . . .	262	0	0
Martin, Wells & Co, Ltd. . . . .	250	0	0
W. H. Lorden & Son . . . . .	244	15	0
C. Gurling . . . . .	228	0	0
J. GARRETT & SON (accepted) . . . . .	219	0	0

## Haverstock Hill.

T. Cruwys . . . . .	£425	0	0
Viney & Stone . . . . .	322	0	0
H. Wall & Co. . . . .	241	0	0
W. Densham & Sons . . . . .	220	0	0
MARCHANT & HIRST (accepted) . . . . .	218	0	0

## Stephen Street.

T. Cruwys . . . . .	£391	0	0
H. C. Clifton . . . . .	334	0	0
R. S. Buckeridge . . . . .	285	0	0
Thompson & Beveridge . . . . .	271	0	0
Marchant & Hirst . . . . .	239	0	0
F. Chidley . . . . .	224	16	3
W. DENSHAM & SONS (accepted) . . . . .	185	0	0

## West Square.

(Clean interiors of old and new portions, and paint interior of science, art and manual training building.)

W. King & Son . . . . .	£616	0	0
H. J. Williams . . . . .	608	0	0
W. Downs . . . . .	517	0	0
Belcher & Co., Ltd. . . . .	511	15	0
W. Sayer & Son . . . . .	474	15	0
MAXWELL BROS., LTD. (accepted) . . . . .	395	0	0

## Cook's Ground.

General Builders, Ltd. . . . .	£269	0	0
Lathey Bros. . . . .	213	0	0
G. H. Sealy . . . . .	199	0	0
Marchant & Hirst . . . . .	193	0	0
E. Triggs . . . . .	189	0	0
W. R. & A. Hide . . . . .	158	0	0
W. HAMMOND (accepted) . . . . .	149	0	0

## LONDON SCHOOL BOARD—continued.

## Baring Road.

H. Leney & Son . . . . .	£127	10	0
T. D. Leng . . . . .	115	0	0
H. Groves . . . . .	104	0	0
W. Hayter & Son . . . . .	98	10	0
W. Banks . . . . .	90	15	6
G. KEMP (accepted) . . . . .	80	0	0

## Elizabeth Street.

J. & M. Patrick . . . . .	£197	0	0
G. Kemp . . . . .	145	0	0
W. J. Howie . . . . .	132	10	0
W. HAYTER & SON (accepted) . . . . .	113	0	0

## Detmold Road.

McCormick & Sons . . . . .	£333	0	0
Barrett & Power . . . . .	260	0	0
Collis Willmott & Son . . . . .	260	0	0
W. Silk & Son . . . . .	251	0	0
H. Runham Brown . . . . .	248	0	0
A. W. Derby . . . . .	233	0	0
J. STEWART (accepted) . . . . .	208	0	0

## Virginia Road.

Johnson & Co. . . . .	£258	0	0
G. Barker . . . . .	250	0	0
Corfield & Co. . . . .	246	0	0
Belcher & Co., Ltd. . . . .	211	5	0
D. Gibb & Co. . . . .	209	0	0
W. Silk & Son . . . . .	197	0	0
H. RUNHAM BROWN (accepted) . . . . .	173	10	0

## Westmoreland Road.

J. H. Jenkin & Co. . . . .	£364	5	0
H. J. Williams . . . . .	286	10	0
Maxwell Bros, Ltd. . . . .	208	0	0
Lathey Bros. . . . .	269	0	0
W. Sayer & Son . . . . .	261	0	0
E. TRIGGS (accepted) . . . . .	219	0	0

## Glengall Road.

Corfield & Co. . . . .	£410	0	0
Johnson & Co. . . . .	328	0	0
Viney & Stone . . . . .	300	0	0
A. E. Symes . . . . .	295	0	0
D. Gibb & Co. . . . .	279	0	0
A. W. Derby . . . . .	276	10	0
T. S. ELKINGTON & SONS (accepted) . . . . .	230	0	0

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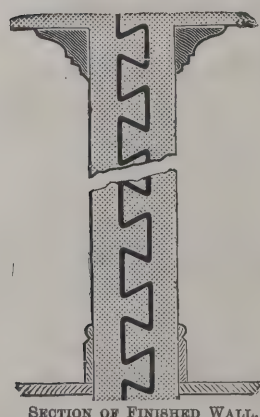
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## MIDDLESBROUGH.

For erection of two ward pavilion blocks, entrance lodge, &c., at the sanatorium, West Lane. Mr. FRANK BAKER, borough engineer.

A. Lyons . . . . .	£9,497	14	0
W. A. King . . . . .	9,090	10	10
Allison Bros. . . . .	9,088	0	0
H. Walker . . . . .	9,041	6	2
S. Coates . . . . .	8,942	0	0
Newby & Co. . . . .	8,794	11	10
Bastiman Bros. . . . .	8,721	15	4
Blackett & Son . . . . .	8,565	10	0
HUDSON BROS., Woodlands Road (accepted) . . . . .	8,530	17	3

## NORTHALLERTON.

For the construction of a new road at Ellerbeck.

PARKIN, Horsforth (accepted) . . . . .	£4,203	16	10
--	--------	----	----

## PRESTWICH.

For street works in George Street, Bowman Street and Park Street.

## Accepted tenders.

F. M. & H. Nuttall, Whitefield, for George Street.  
Etheridge & Clark, Cheetham Hill, Park Street and Bowman Street.

## ST. ANNES-ON-SEA.

For sewerage works in St. David's Road, North and Back Cross Street. Mr. HENRY GREGSON, surveyor.

Exors. of the late S. England, St. Annes-on-Sea (accepted).

For supply and erection of 190 lineal yards unclimbable iron fence, 4 feet 3 inches high, with terminal pillars, &c. Mr. H. GREGSON, surveyor.

GILL & READ, St. Annes Road West (accepted).

## SCOTLAND.

For construction of pipe-sewer in Ferry Road, between the North British Railway bridge (Edinburgh, Leith and Granton branches) and Clark Road.

T. DAVIDSON, jun., 56 Easter Road (accepted) . . . . .	£60	3	0
--	-----	---	---

## SHAWFORD.

For supply and erection of fencing at the Otterbourne water-works, near Shawford, Hants. Mr. WILLIAM MATTHEWS, engineer.

JUKES, COULSON, STOKES & Co., London (accepted) . . . . .	£126	0	0
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## SLEAFORD.

For erection of schools at Sleaford, Lincs. Mr. JESSE CLARE, architect, Sleaford.

W. Pattinson & Sons . . . . .	£2,553	0	0
Berry & Clay . . . . .	2,326	0	9
Guttridge . . . . .	2,196	0	0
F. Pattinson . . . . .	2,191	0	0
J. J. Banks . . . . .	2,005	17	6
MAXEY & SONS, Sleaford (accepted) . . . . .	1,948	0	0
Parker & Son . . . . .	1,929	0	0

## STOCKPORT.

For street works in Sandfold Lane, from Buckley Street to Canal Bridge. Mr. JOHN ATKINSON, borough surveyor.

J. Ludlow . . . . .	£306	5	5
P. & S. Kearsley . . . . .	276	4	8
Hayes Bros. . . . .	270	11	6
Gosling & Stafford . . . . .	270	7	6
W. H. EVA, Cheadle Heath (accepted) . . . . .	264	17	0

## WALES.

For erection of Pentrechwyth school, Swansea. Mr. THOMAS H. JONES, architect, School Board Offices, Swansea. Quantities by Messrs. W. H. BARBER & SON, London, W.C.

J. & F. Weaver . . . . .	£3,900	0	0
J. & D. Jones . . . . .	3,900	0	0
John Williams . . . . .	3,840	0	0
J. Marles & Son . . . . .	3,819	0	0
Hy. Billings . . . . .	3,760	0	0
Bennett Bros. . . . .	3,680	0	0
Walters & Johns . . . . .	3,650	0	0
Lloyd Bros. . . . .	3,560	0	0
D. Jenkins . . . . .	3,410	0	0
Thos. Richards . . . . .	3,250	0	0
George Crocker . . . . .	2,787	9	0
D. W. Rosser . . . . .	2,230	10	0

For sewerage works at Griffithstown.

J. Rawlings . . . . .	£425	0	0
D. W. Richards, Ltd. . . . .	375	0	0
A. & J. Richards . . . . .	294	0	0
P. Chapman . . . . .	275	0	0
Davies & Co. . . . .	257	9	0
W. J. JENKINS & SONS, Dinas Powis (accepted) . . . . .	245	15	0

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## WALES—continued.

For additions to Dock Road Brewery, Mon. Messrs. ADLAM & SONS, architects, Bristol.

D. Parfitt . . . . .	£9,950	0	0
C. H. Rees . . . . .	9,500	0	0
C. Jordan . . . . .	9,360	0	0
J. Hooper . . . . .	8,995	0	0
W. Jones & Son . . . . .	8,987	0	0
J. Jenkins . . . . .	8,897	0	0
C. A. Hayes . . . . .	8,820	0	0
F. Chown . . . . .	8,800	0	0
D. W. Richards, Ltd. . . . .	8,800	0	0
J. Charles . . . . .	8,704	0	0
Leadbeater Bros. . . . .	8,540	0	0
T. Lowe & Son . . . . .	8,120	0	0
A. S. Morgan & Co., Ltd. . . . .	7,990	0	0
W. Blackburn . . . . .	7,987	0	0
Jarrett & Fisher . . . . .	7,920	0	0
J. LINTON & CO., LTD., Newport (accepted) . . . . .	7,870	0	0

For erection of four cash offices at the pier head, Harroby Street, Lincoln Street and Woodville Road East, Cardiff. Mr. W. HARPUR, borough engineer.

F. Waterman . . . . .	£813	4	1
W. Parnall . . . . .	696	2	9
Gough Bros. . . . .	690	0	0
W. Symonds & Co. . . . .	600	3	10
A. W. Cadwallader . . . . .	564	7	10
E. Turner & Sons . . . . .	560	10	8
F. Small . . . . .	511	0	0
KNOX & WELLS, Bangor Street, Cardiff (accepted) . . . . .	480	15	6

## WELLINGBOROUGH.

For erection of a wall on the northern side of the Urban District Council's yard in Cannon Street.

Harris Bros. . . . .	£164	10	0
R. Marriott . . . . .	160	0	0
Berrill & Green . . . . .	150	0	0
W. J. Harrison . . . . .	150	0	0
W. Stevens . . . . .	139	0	0
J. H. SMITH, Wellingborough (accepted) . . . . .	130	0	0

## WOOLWICH.

For decorations and structural repairs at 64 Charlton Lane. Mr. J. O. COOK, architect, Eleanor Road, Woolwich.

W. Holt . . . . .	£259	0	0
Pearce & Co. . . . .	224	0	0
F. H. Bastin . . . . .	215	0	0
E. Proctor . . . . .	195	0	0
W. Quilter . . . . .	170	0	0
E. Mills . . . . .	166	0	0
P. S. HOWARD, Woolwich (accepted) . . . . .	145	0	0

For alteration at the mortuary and post-mortem room at the union infirmary, Plumstead. Mr. J. O. COOK, architect Eleanor Road, Woolwich.

W. S. Sharpin . . . . .	£486	0	0
A. J. Wace . . . . .	473	0	0
S. Watts . . . . .	430	16	0
Sandford & Co. . . . .	420	0	0
Bastin & Co. . . . .	356	5	0
P. S. HOWARD, King Street, Woolwich (accepted) . . . . .	345	0	0

Received too late for Classification.

## COMPETITION OPEN.

KETTERING—Designs are invited for a new free library. Premiums of 60*l.*, 40*l.* and 25*l.* are offered respectively. Mr. John Bond, clerk, U.D. Council, Council Offices, Market Street.

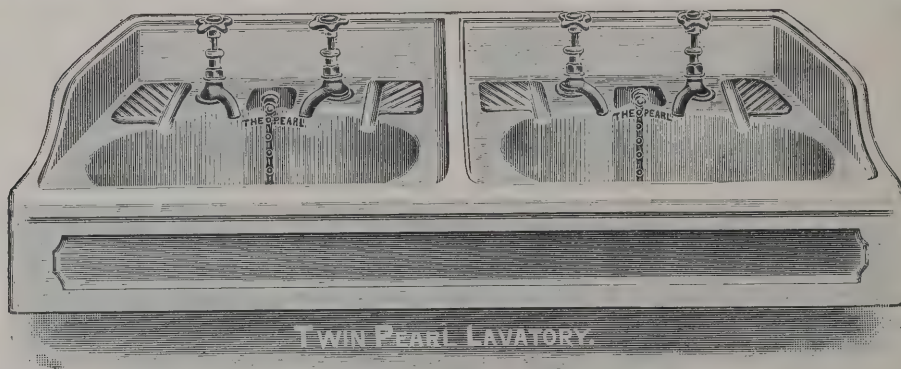
## CONTRACTS OPEN.

BARNSELY.—Jan. 7.—For erection of five sand-washers and making and delivery of a small quantity of straight cast-iron socket pipes, of from 5 inches to 18 inches internal diameter, together with certain special pipes, in connection with the Midhope Waterworks filter beds in course of construction near Upper Midhope. Messrs. T. & C. Hawksley, 30 Great George Street, Westminster, S.W.

BOLSOVER.—Jan. 7.—For supply of steam road-roller weighing 10 tons or 12 tons (separate). Mr. John Hunter, clerk to the Urban District Council, Bolsover, Chesterfield.

BOW—Jan. 20.—For the reconstruction and widening of Bow Bridge, carrying Bow Road over the River Lee, and situate partly in the County of London, and partly in the County of Essex. Particulars at the Engineer's department, L.C.C. County Hall, Spring Gardens, S.W.

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DIAPER WORK AND CAPITALS IN NORTH TRANSEPT.

ADDITIONS TO QUARRY MOUNT, MERSTHAM.

BRISTOL.—Jan. 6.—For supply of surface condensers, &c., for the second instalment of the Avonbank Electricity Works. Mr. H. Faraday Proctor, city electrical engineer, Temple Back.

CANTERBURY.—Jan. 1.—For installation of a system of electric tell-tales, clocks and bells at the Borough Asylum. Particulars upon application to the Borough Electrical Engineer, Electricity Works.

COLCHESTER.—For the supply of furniture required for a new school, providing accommodation for about 800 children. Mr. Charles E. Denton, clerk, School Board Offices.

DEVONPORT.—Jan. 14.—For construction of septic tanks, bacterial filters, buildings, &c., at the Fish Pond, Camelshead. Mr. J. F. Burns, borough surveyor, 39 Ker Street, Devonport.

GRIMSBY.—Jan. 12.—For supply of an electrically-driven capstan for use at the electricity works. Mr. W. A. Vignoles, borough electrical engineer, Corporation Electricity Works, Grimsby.

HOUNSLOW.—Jan. 6.—For sewerage works on the Treaty House Estate, Hounslow. Mr. P. G. Parkman, surveyor, Town Hall, Hounslow.

KETTERING.—Jan. 5.—For supply of two miles of 21-inch diameter cast-iron water pipes, with sundry specials; about 150 feet of 20-inch diameter cast-iron steam exhaust pipes, with sundry specials, &c. Mr. T. Reader Smith, surveyor, Market Place, Kettering.

MIDDLETON.—Jan. 22.—For erection of the new Post Office and tenement offices in Long Street and Sadler Street. Messrs. Stones & Stones, architects, 10 Richmond Terrace, Blackburn.

NOTTINGHAM.—Jan. 8.—For the erection of a bridge over the Canal, Willford Street, Nottingham. Mr. Arthur Brown city engineer, Guildhall, Nottingham.

ROMFORD.—Dec. 29.—For supply and delivery of about 2,440 yards lineal 12-inch best stoneware glazed pipes, about 1,410 yards lineal 9-inch best stoneware glazed pipes, about 240 yards lineal 6-inch best stoneware glazed pipes, about 60 6-inch off 12-inch stoneware junctions, about 46 6-inch off 9-inch stoneware junctions, stoneware channel pipes, bends, junctions, &c., about 50,000 stock bricks, about 16 tons Portland cement, about 195 galvanised wrought-iron step irons, about 1,226 yards super tar paving, about 4,414 feet lineal 12-inch by 6-inch Norway granite kerb (straight), about 45 feet lineal 12-inch by 6-inch Norway granite kerb (circular), about 1,600 feet lineal 12-inch by 6-inch Norway granite channelling, about 65 1-3 yards super 4-inch by 4-inch Leicester setts on 6-inch Portland cement concrete, about 37 1-3 yards super 4-inch by 4-inch Leicester setts on 4-inch Portland cement concrete, about 12 feet 12-inch cast-iron pipes, about 24 gullies (Sykes's patent), blue bricks (ordinary and bull-nosed), about 39 flushing blocks (Doulton's), about 41 manhole covers (G. Waller & Co's pattern), about two lamphole covers (G. Waller & Co's pattern), about 10 ventilating columns (F. Bird & Co's pattern). Mr. J. Turvey, surveyor, Council Offices.

TRING.—Jan. 5.—For erection of engine-house and the construction of about 200 yards of cast-iron rising main, as well as laying out forty-five acres of land for irrigation, together with all distributing carriers and under-drains. Messrs. Wilcox & Raikes, engineers, Union Chambers, 63 Temple Row, Birmingham.

WEALDSTONE.—Dec. 30.—For the constructive works at the sewerage outfall. Mr. C. Nicholson Lailey, 6 The Sanctuary, Westminster.

WITHINGTON.—Dec. 31.—For street works in Clarendon Road, Whalley Range; Claude Road, Chorlton-cum-Hardy; and School Lane, Didsbury; and for sewerage in Ford Lane, Didsbury, and Cavendish Road, West Didsbury. Mr. A. H. Mountain, surveyor, Town Hall, West Didsbury.

## ELECTRIC NOTES.

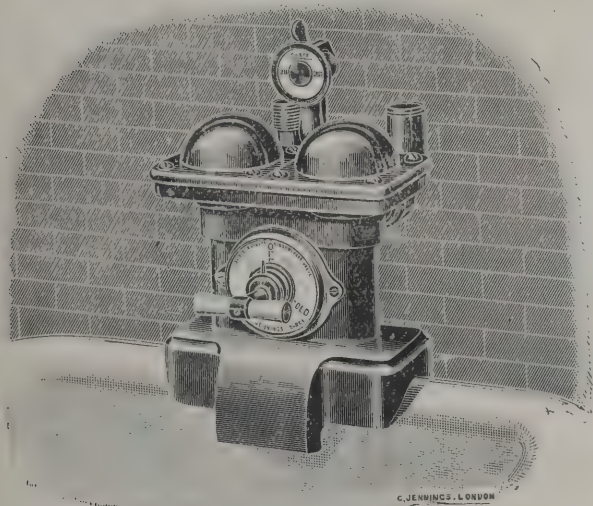
THE Colchester Corporation has decided to apply for sanction to a loan of 7,270*l.* for generating plant, &c.

THE Oxford City Council has appointed a committee to report as to a system of electric tramways.

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THE Weymouth Council has applied for permission to borrow 44,800*l.* for electric supply purposes.

THE extensions of the electric-lighting mains were authorised at the last meeting of the Reigate Town Council.

A LOCAL GOVERNMENT BOARD inquiry has been held in Sunderland for leave to borrow 74,000*l.* for purposes of electric lighting.

THE Local Government Board has sanctioned the raising by the Tunbridge Wells Town Council of a loan of 10,000*l.* for electric light purposes.

THE Burnley Corporation has instructed the borough engineer and borough electrical engineer to prepare plans for electric tramway extensions.

AN inquiry has been held into the Wallasey Urban District Council's application to borrow 52,350*l.* for electric supply and traction purposes.

THE Derby Town Council has appointed Mr. C. H. Wordingham, of Manchester, to report upon the various sites for the proposed tramways electric generating station.

PROFESSOR KENNEDY has been selected by the Kilmarnock Council to prepare a report on electric lighting and tramways.

THE Walsall Town Council has adopted the recommendations that electric-lighting mains be laid in certain streets at an estimated cost of 6,350*l.*, that a transformer sub-station be provided at an estimated cost of 3,700*l.*, and that application be made to the Local Government Board for a corresponding loan of 10,050*l.*

### BUILDING AND BUILDERS.

A LOCAL GOVERNMENT BOARD inquiry has been held into the application of the Colne Corporation to borrow 9,569*l.* for baths and wash-houses.

THE Local Government Board has held an inquiry regarding the application of the Kingswinford Rural Council to borrow 67,000*l.* for sewerage and sewage disposal purposes. The sewage farm, including compensation, would cost 13,075*l.* of the total outlay.

THE Wavertree (Liverpool) City Council has adopted a proposal recommending the erection of public baths in Picton Road and Glynn Street, and application is to be made to the

Local Government Board for sanction to borrow 26,000*l.* for the purpose. The estate committee were authorised to accordingly appropriate a piece of land.

SUNDERLAND watch committee have had before them plans from Messrs. W. & T. R. Milburn, for Mr. H. Rudland, for a new theatre, to seat over 2,000 persons, on ground once occupied by the old Star Music Hall and other properties in Upper Sans Street. The plans have been approved by the committee. Plans have also been approved by the building committee for alterations and improvements to the People's Palace.

THE property committee of the Bridlington Town Council have submitted a scheme of proposed extension of the Parade northwards by 210 feet, in a line with the present Parade, showing no seaward extension. Provision was also made for a pavilion to accommodate about 2,000 people, with café and shops. The scheme also provided for the terracing of Victoria Jetty sea defences, with provision of a public shelter, the estimated cost of the work being 26,238*l.*

MESSRS. BAYLISS, JONES & BAYLISS, nut and bolt makers, have taken land on the east side of the river Usk, and are about to erect extensive works there. Recently Messrs. Nettlefolds decided to erect other works right on the seaboard. They purchased the Great Western wharf on the Usk, at Newport, which has siding accommodation in touch with the Great Western Railway, and they are now erecting large works there. It is understood that yet another firm has also taken land, or is about to do so, at Newport. Messrs. Bayliss, Jones & Bayliss are also extending their Wolverhampton works, and are laying down a powerful electric-lighting plant.

At a recent meeting of Chester Town Council the housing of the working classes committee submitted a plan and estimate for twelve cottages, with a recommendation that they be sent to the Local Government Board for approval, with an application to borrow 2,160*l.*, the estimated cost. Mr. John M. Frost contended that they would not be able to let the cottages they were proposing to build profitably at a rent of 2*s.* 6*d.* to 3*s.* a week, and cottages at those rents were what was required in Chester. Alderman Churton took the same view, but favoured a small experiment in this direction. They must, however, be careful as to how far they were philanthropic with the ratepayers' money. Mr. S. Moss, M.P., and others, supported the recommendation, which was carried without a dissentient.

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At a meeting of the Walsall School Board on the 17th inst., Mr. J. Armstrong presiding, it was decided, on the recommendation of the building committee, to forward plans for the erection of a new school and cookery kitchen at the Pleck for the approval of the Education Department. Dr. Lynch said as it was recognised that the Church party were the governing body on the Board, he would like to acknowledge the extraordinarily generous policy pursued by them in providing extra accommodation. Estimating the population of the borough at 92,000, the number of school places provided should be, according to the Education Department's general rules, about 15,000. At the present time the permanent elementary school accommodation in the town was 15,570, and the Board had committed themselves to schemes for providing new schools which would increase the accommodation by over four thousand places. In this they had provided for the requirements of an increased population of about 25,000, and when the new educational authority took office there would be no need for them to erect any new schools for ten or twelve years.

### VARIETIES.

THE Burslem gas committee are considering the advisability of installing a Dellwik water gas plant, and have instructed the engineer, Mr. H. Peaty, to arrange for their seeing the plant at one or two works where it is in operation.

AT a special meeting of Barrow Town Council it was announced that the summer meeting of the Iron and Steel Institute will be held at Barrow next year, when Mr. Andrew Carnegie, who has arranged to be in England at the time, will be president. This is the second visit of the Institute to Barrow, the first occasion being in 1874, when the late Duke of Devonshire, the first president of the Institute, was in the chair.

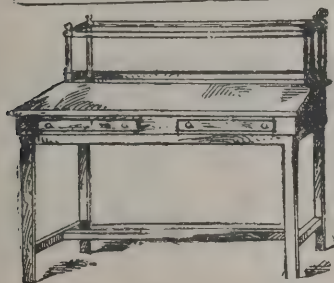
AN open competitive examination for not fewer than twelve situations as assistant examiner in the Patent Office, will be held by the Civil Service Commissioners in February next. The examination will commence on the 17th of the month, and forms of application for admission to it will probably be ready for issue in the course of a few days; they will be obtainable on request addressed by letter to the Secretary, Civil Service Commission, Burlington Gardens, London, W.

THE St. Bride's Press, Ltd., who are the proprietors of the *County Council Times*, the official organ of the County Councils and of various educational associations, will publish on the first day of the New Year a weekly paper to be called "Education, Primary, Secondary and Technical," which will deal mainly with the work of the authorities under the Education Act.

AT a meeting of the Glasgow Archaeological Society held in the hall of the Philosophical Society, Bath Street, Professor Cooper presiding, it was agreed, on the motion of the chairman, to record in the minutes the Society's sense of the deep loss it had suffered by the death of Emeritus Professor Young, a former president. On the motion of Mr. George Neilson, it was remitted to the Council, as a committee with powers, to confer and take joint action with the Philosophical Society in supporting the Scottish Text Society's endeavour to attract more public attention in the West of Scotland to early Scottish literature. The Hon. John Abercrombie afterwards read a paper on "A Method of Arranging British Bronze Age Ceramics in Chronological Order."

THE first of two consumptive sanatoria erected by the Glasgow District Lunacy Board for the treatment of consumptive patients among the insane was opened on the 16th inst., in proximity to the general asylum buildings at Gartloch, which are situated about six miles to the east of Glasgow. The other was opened on the 18th at Woodilee Asylum, which is situated a few miles further to the east of the city. These sanatoria are exceptional in respect that they have been constructed entirely of composite wood and iron, building materials involving very much less cost than would have been necessary in erections composed of brick or stone. The General Lunacy Board sanctioned their erection in the month of June last, and now, so satisfied is this authority with the substantial and comfortable appearance and with the promise of durability which the institutions present, that they have recommended the Edinburgh District Lunacy Board to take steps for the erection of similar buildings at Bangour to meet the present and prospective needs of Edinburgh district.

SURVEYS for the Manitoulin and North Shore Railway route in Canada are now complete, and tenders for the construction of the railway are about to be called for, so as to have everything ready for an early beginning in the spring. A railway to the Pacific Ocean is to be built in connection with the



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Grand Trunk Railway Company of Canada, but constructed under a separate corporate name, and called the Grand Trunk Pacific Railway. The line is intended to extend from North Bay or thereabout through New Ontario, Manitoba, Saskatchewan and Alberta, by way of the Peace River or Pine River Pass, and through British Columbia, reaching its terminus on the North Pacific Coast, probably at Fort Simpson or Bute Inlet. The railway is to be of an excellent modern standard, with low grades, long tangents and heavy rails, all elements of economical working. After leaving Manitoba the line will run almost north-west, tapping the rich Battleford and Edmonton country and the districts of Athabasca and Northern British Columbia.

### TRADE NOTES.

THE Empire Boiler and Engineering Company, Ltd., Halifax, have constructed two rivetted Trentham boilers for the Royal Berkshire Hospital, Reading, which are being fitted at the hospital by Mr. J. T. Spencer, of Reading.

THE tender of the Columbian Fireproofing Company, Ltd., 37 King William Street, E.C., has been accepted for the fire-proof floors at the new building about to be erected on the site of Nos. 11 and 12 Finsbury Square. The architects are Messrs. Hesketh & Stokes, F.F.R.I.B.A., of 110 Cheapside, and the builders Messrs. Perry Bros., Cambridge Heath.

THE inhabitants and tenantry on the Middleton estate at Settrington, near Malton, Yorks, have given Messrs. Wm. Potts & Sons, clock manufacturers, Leeds, an order to make and fix a new eight-days' hour-striking clock, showing the time upon one large external dial, to be erected in the tower of the parish church to the memory of the late Dowager Lady Julia Middleton, of Settrington House. It is to be fixed at an early date.

### BACTERIAL TREATMENT AT REIGATE.

COLONEL COKE, R.E., held a Local Government Board inquiry on the 10th inst. into an application of the Reigate Corporation for a loan of 14,000*l.* for works of sewage disposal. The Town Clerk stated that it was proposed to adopt the bacterial system, as the method of precipitation followed by land treatment had given rise to serious complaints owing to the land having become sewage sick.

Accordingly in 1898 an experimental bacteriological installation was laid down, various methods being tested, and so satisfied were the Council with the results obtained from bacterial oxidation beds fed with the Candy sprinklers that they desired to carry out that system for the treatment of the whole of the sewage of the borough. Samples of the effluent obtained from the system they proposed to adopt had been analysed by Dr. Jacob, medical officer of health, and Dr. Stevenson, the eminent Home Office analyst, whose reports were extremely satisfactory.

Mr. F. T. Clayton, the borough surveyor, explained fully the details of the scheme, which comprises preliminary treatment of the sewage in catch tanks, followed by filtration through bacterial oxidation beds fed by Candy-Whittaker revolving sprinklers; the filtration will be double, firstly through coarse beds, and then through fine beds with the oxidising material Polarite, on the lines of the trial installation which has been in successful operation for four years, and with which the borough surveyor expressed himself fully satisfied.

The new scheme, Mr. Clayton stated, would result in a direct saving of about 900*l.* a year to the borough, and indirectly in a further considerable economy.

Dr. Jacob, medical officer of health, gave evidence that he had examined samples of crude sewage and effluent; the crude sewage contained brewery refuse and also a very large quantity of tannery refuse, yet the effluent was always perfectly satisfactory, inodorous, and below the standard adopted by experts. The effluent was good enough, Dr. Jacob went on to say, to be turned direct into the stream.

Dr. Stevenson's report giving the chemical and bacteriological analyses of the effluent from the trial works was read, and showed 94 per cent. of chemical and over 98 per cent. of bacteriological purification.

It is interesting to note that there was a very large reduction in the bacillus coli communis and in the spores of the bacillus enteritidis sporogenes, while previous bacteriological investigations by Dr. Griffiths showed that the Candy sprinkler system destroyed the typhoid bacillus.

The mayor, ex-mayor and chairman of the sewage farm committee all expressed their approval of the scheme, on which the ex-mayor remarked the Council were unanimous.

At the conclusion of the inquiry Colonel Coke complimented Mr. Clayton upon his plans, and then visited the sewage farm and inspected the existing works and the bacterial installation, which has attracted much attention throughout the country.

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## SNOW HILL STATION, BIRMINGHAM.

THE plans are being rapidly pushed forward for the contemplated improvements at Snow Hill Station, which have already been foreshadowed in our columns, and which, says the *Birmingham Daily Express*, when completed, will make the Great Western connection with Birmingham somewhat worthy the importance of the Midland metropolis. As a matter of fact the preliminary work in the direction of Hockley and Handsworth has been in progress for a considerable time, and within a very few weeks operations will be commenced in the neighbourhood of Snow Hill itself. The alterations will involve an expenditure of at least 300,000*l.*, and will be carried out according to the designs of Mr. J. C. Inglis, the chief engineer of the Great Western Company. The existing lines in the direction of Wolverhampton will be considerably widened from Great Charles Street onwards, and new "bay" lines and platforms will be provided for local traffic, with access from Great Charles Street. The impossibility of providing a greater width has been the chief difficulty to be surmounted, but this has been overcome by an ingenious subterranean or low-level arrangement for dealing with parcels and goods traffic. On the "up" or Snow Hill side, the present buildings will disappear altogether, and a bay-line for local traffic (Bordesley, Acock's Green, &c.) will be provided. The station yard for the use of cabs, passengers, &c., still on the platform level, will be considerably increased in length, and an extensive range of offices and other buildings, three storeys in height, will take the place of the present antiquated structure, whilst underneath the parcels and other similar traffic will be handled by means of hydraulic lifts. Work of this elaborate character must necessarily—if the ordinary traffic is not to be interfered with—extend over a very considerable period, and in the meantime the company have not overlooked the creature comforts of the public. Gradually, as circumstances permitted, the railway company themselves have been taking over the management of the refreshment departments on their system. For many years these have been in the hands of Messrs. Browning & Co., of London, but as the leases of various rooms fell in they have been taken over by the railway company, and in the efflux of time the whole of the catering arrangements will, as is the case with the other great railway systems, be under the management of the railway people themselves. That this is in the interest of the travelling public will not for a moment be doubted. Birmingham and Wolverhampton are

amongst the last of the towns to fall within this scheme, and recently the dining and refreshment rooms at Snow Hill were formally opened under the direction of the company's manager, Mr. S. D. Knott. In their new and up-to-date guise they will scarcely be recognised as the stuffy, antiquated rooms of the old days. They have been most elaborately furnished by Messrs. Gaskell & Chambers, Ltd., bar fitters, etc., of Dale End. The woodwork is in light polished oak, with white marble counters, and the upholstery in green leather. The old windows have given place to tastefully-designed cathedral glass by Messrs. Yates & Greenways, and the painting and decorations have been carried out by Messrs. F. Horton & Son, in an artistic arrangement of ivory and peacock blue, a frieze of bold design adding greatly to the effectiveness of the scheme. Mr. C. W. Chambers presided at a dinner, served in the dining-room on the Snow Hill side, at which Mr. C. R. Williams (Engineering Department, Paddington), Mr. Herring, station master; Mr. W. E. Evans, catering department, Mr. A. E. Horton, Mr. Greenways, Mr. H. Hartill, &c., were present, and at which the rooms, under the new management, were formally dedicated to the public use.

## ENGINEERING ACHIEVEMENTS.

A LECTURE was given by Professor Hudson Beare, M.Inst.C.E., Regius Professor of Engineering, Edinburgh University, on "Some Notable Achievements in Engineering during the Past Quarter of a Century." After a brief introductory statement as to the changes in the conditions under which the great mass of our population live, and the marked reduction in the death rate in large cities during the past 25 years owing to the great sanitary works which had been carried out, the lecturer described in detail, as two typical great engineering works executed during this period, the Liverpool Waterworks and the Tower Bridge over the Thames in London. Lake Vyrnwy was the largest artificial reservoir yet constructed in Europe, and was the first in Great Britain in which a lofty masonry dam was employed. The dam, founded on the natural rocky bar which held up the post-glacial lake once occupying this site, was 1,172 feet long at the top, its greatest height from the foundation to the top of the parapet being 161 feet, and its maxi-

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mum thickness at the base 120 feet. It contained in all some 700,000 tons of masonry. The artificial lake held back by this vast masonry construction was  $4\frac{3}{4}$  miles long and half a mile wide, and had a capacity down to the depth to which the water may be drawn off for supplying the city of Liverpool (at the rate of 40,000,000 gallons a day) of 12,130 million gallons, or over 300 days' supply. The water was drawn off at the water tower, a picturesque masonry structure standing well out into the lake. In this tower were the necessary valves for controlling the admission of water to the aqueduct, and by means of telescopic pipes water was always drawn off from the purest level. It then passed through exceedingly fine wire gauze strainers before entering the aqueduct. The aqueduct was 68 miles long from the lake to the reservoir near Liverpool, and in order to reduce the static pressure it was divided into six sections, between each of which was a reservoir in which the water could rise. This aqueduct passed through three ridges by means of tunnels and across a great number of streams and railway lines, the most difficult crossing being that under the Mersey. When entirely complete, the aqueduct would consist of three  $42\frac{1}{2}$ -inch cast-iron pipes, laid 3 feet under the surface, and following the general contour of the country. At present only one of these had been put in, but all the more costly works had been completed for three. Filter beds had been provided at Oswestry near one of the equalising reservoirs. This great work was begun in 1880, and the dam was completed and filled in 1889. The total cost for the one pipe and the aqueduct was, roughly, 2,300,000*l.* sterling, giving Liverpool a daily supply of 15,000,000 gallons of water, and each additional pipe to complete the three would cost about another three-quarters of a million. The Tower Bridge over the Thames was remarkable both for its architectural features (necessary on account of its proximity to the old Tower of London, connected with so many stirring incidents in the history of the nation) and for the ingenious way in which it solved the difficulty of providing a convenient level for the cross traffic without interfering with the navigation of the river by large vessels. The width of the river from abutment to abutment was 380 feet, divided by the two great piers into a central span of 200 feet and two side spans of 270 feet each. The roadway of the two side spans was slung by means of chains, which passed from the high towers to the abutment towers, and then to anchorages in the solid ground. Those two chains were connected together in the centre by ties passing from one

of the high towers to the other. In order to provide accommodation for foot passengers when the central span was open there was a high level foot bridge, which spanned the 200-foot gap, near the top of the central towers, and in the central towers were staircases and lifts giving access to it. At the road level of the centre span occurred the striking feature of the bridge; the 200-foot gap was spanned by a double bascule or drawbridge; each of the two halves was carried on a pivot in its corresponding big pier, and its tail end was prolonged and loaded with a counter balance. When the two halves were lowered into their ordinary position they together formed a flat arch spanning the gap and leaving a headway of  $29\frac{1}{2}$  feet above high-water mark. By hydraulic machinery, however, they could be raised into a vertical position, leaving a clear water way of 203 feet wide and a headway to the underside of the foot girder of 145 feet above high-water mark. Each of these two halves weighed 1,070 tons, and it was most striking to see the extraordinary ease with which these enormous masses were turned on their pivots to the vertical position, a vessel passed, and they came down once more with the same ease, to form again a complete roadway, and in about two or three minutes in all the traffic was again passing over the bridge as if nothing had happened. It was begun in 1880 and opened by the Prince of Wales in 1892, and cost in all 902,500*l.* The daily traffic across it was enormous. A year or two after it was opened 60,000 foot passengers and 8,000 vehicles crossed every twenty-four hours. At the close of the lecture cordial thanks were awarded to Professor Beare and to the Chairman.

### THE INSTITUTION OF CIVIL ENGINEERS.

At the ordinary meeting on Tuesday, December 16, Mr. F. W. Webb, vice-president, M.A., in the chair, the paper read was "The Rupnarayan Bridge, Bengal-Nagpur Railway," by S. Martin-Leake, Assoc. M. Inst. C.E.

The Rupnarayan bridge at Kola was built by the Bengal-Nagpur Railway Company, and formed part of the direct east coast line between Calcutta and Madras. The Rupnarayan was both a river and a tidal creek. The total discharge had been estimated to be 563,530 cubic feet per second, with a velocity of 10 feet per second. The river was embanked on either side, and the flood-level was considerably higher than the surrounding country; the greatest depth of water before work com-

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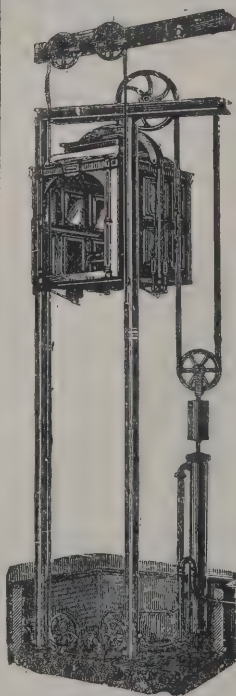
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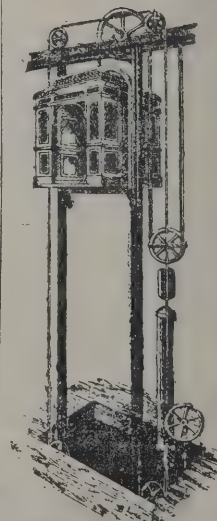
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menced was 17 feet below low water. The bridge consisted of seven spans of 300 feet (314 feet 6 inches from centre to centre of piers) and four spans of 100 feet, two at each end. The piers were all built for a double road, but girders for one road only had been erected.

The piers for the larger spans were founded on steel caissons, 88 feet in height, 63 feet in length and 22 feet in width, with semicircular ends. Each caisson was divided by means of cross bulkheads into three dredging-chambers, 13 feet 6 inches in width. The inner plates of the bottom 12 feet were inclined to a cutting edge, and formed the shoe. Above the shoe, the caisson was built up of rings 4 feet in height, connected together by horizontal angle-bars; each ring could therefore be erected complete, lifted into position, and rivetted to the caisson, thus saving time. Each caisson weighed 385 tons.

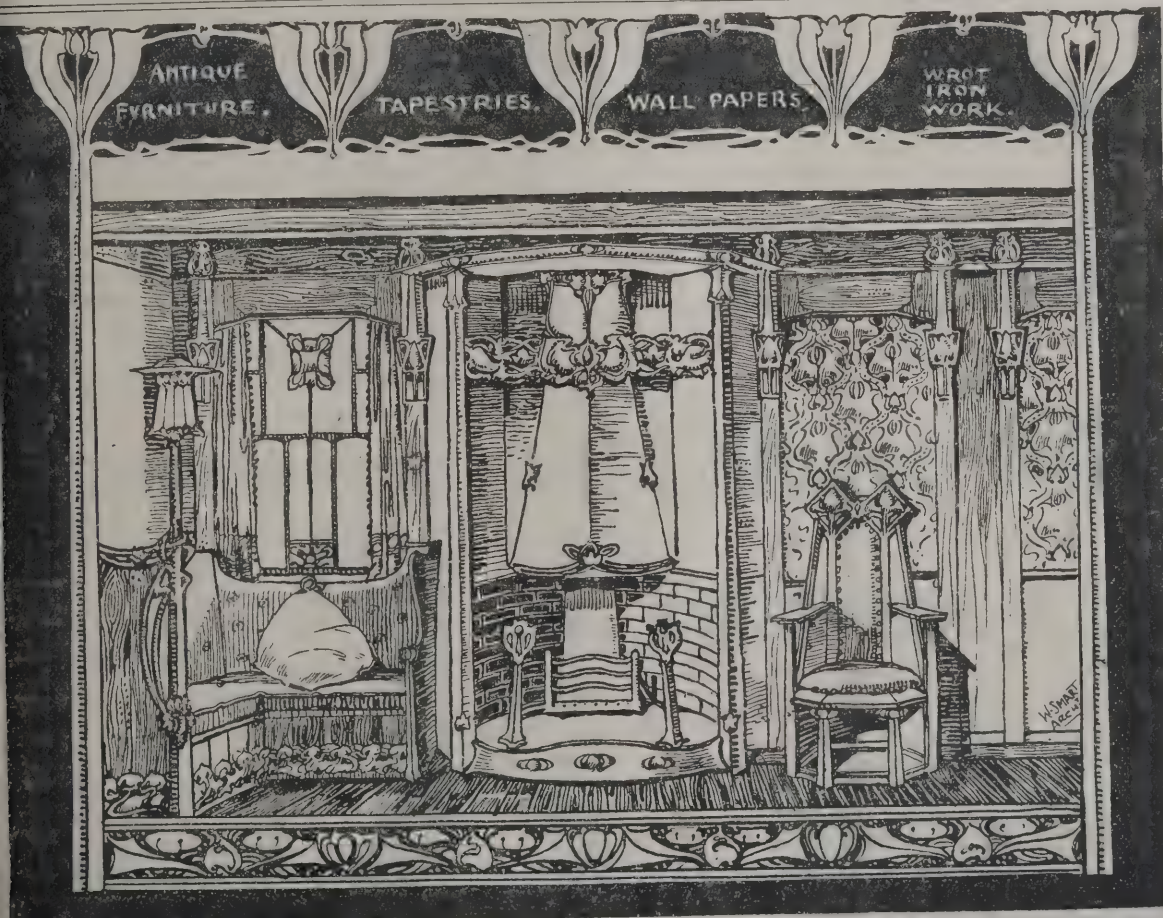
The river bottom consisted of a layer of hard blue clay, covered on the east side with silt; this clay extended to a depth of about 10 feet. Below the blue clay, yellow clay, varying in quality, was met with to a depth of 55 feet; below this was sand, and in this sand the caissons were founded. Caissons Nos. 1 and 8 were sunk from ground-level; Nos. 5, 6 and 7 from islands; and Nos. 2, 3 and 4 were lowered and sunk from a floating staging erected on flats.

Work commenced on No. 1 caisson (on the west bank) in August 1897. At first the sinking was carried out by men inside the caisson, the clay sunk through being impervious to water, but at a depth of 16 feet the external pressure was found to be bulging the side cutting edges inwards; dry sinking was therefore stopped and the caisson filled with water. No further attempt at dry sinking was made with any of the caissons. Further sinking was done with dredgers. At a depth of about 78 feet the caisson hung badly and refused to go down; holes were excavated below the cutting edge and some of the internal water was baled out; the caisson then began to move, going down 9 feet in four hours. Baling out some of the water after excavating holes below the cutting edge was found to be a certain method of moving the caissons whenever they refused to follow the dredging. Bruce and Batho dredgers, each having a capacity of 30 cubic feet were used, one in each of the three dredging-chambers. The dredgers were suspended from a horizontal timber supported by a staging of old rails, stiffened with angle-bars. As the caisson sank and more rings were added, lengths of 8 feet were added to the verticals and the lower stiffening-bars were disconnected and refixed to

the newly-added lengths. The verticals were built in as the masonry filling of the caisson advanced in height. Thus no time was lost in dismantling and re-erecting staging each time the caisson was added to. The staging remained permanently in position. The sinking of No. 1 caisson was completed in August, 1898.

In October 1897 islands were constructed for caissons Nos. 6 and 7 by driving piles about 5 feet apart, enclosing a space similar in shape to the caisson, but allowing 5 feet clear all round. Outside sandbags were heaped against the piles, the inside being filled with silt, and on this the caissons were erected. The sinking was done with dredgers. The three steam-hoists working the dredgers were contained in a large barge moored alongside the caisson. Caisson No. 6 was completed in September 1898 and No. 7 in August 1898; caisson No. 5, also sunk from an island, was commenced in December 1898 and completed in September 1899. As soon as these caissons were known to have entered the blue clay the tides were allowed to wash away the islands.

It was not possible, without incurring great expense, to make islands for caissons Nos. 2, 3 and 4, the tides running very strong at their sites. These caissons had therefore been lowered from a floating staging. Two ordinary river flats, 180 feet by 26 feet by 9 feet, had been purchased in Calcutta; these were placed 24 feet apart and carried the staging required. The staging consisted of two parts, the forward position, 40 feet in height, being used for lowering and sinking the caissons. The height was necessary in order to clear the caissons at low water during sinking; the after portion, 20 feet in height, was used for erecting the rings on; three rings could be erected complete on it at one time. The staging was made of Oregon pine, a special consignment of which was obtained from America. The caisson shoes were erected and made watertight on a temporary platform placed over the space between the flats. Each shoe, weighing 75 tons, was lifted by means of sixteen 10-ton Weston pulleys suspended from the top of the staging, each group of four blocks being connected to one hook placed under the cutting edge by means of equilibrium bars. The shoes, having first been raised sufficiently to allow the platform to be removed, were then lowered into the water until a part of the weight was carried by flotation. Rings had then been added until the total height of caisson was sufficient to keep the top above water at high tide after pitching. The caisson was then ready to ground. Previously the moorings of the flats had been adjusted daily.



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At the top of the tide the caisson was lowered sufficiently to allow the cutting edge to ground as the tide fell, and any final adjustments for position and span to be carried out. As soon as the loads were taken off the hooks the lowering tackle was disconnected and water admitted into the caisson. No difficulty was found in pitching the three caissons on their exact sites. Caissons Nos. 2 and 4 were sunk by means of Sir Bradford Leslie's boring plant, No. 3; after pitching, by dredgers. The plant consisted of a boring-head with four arms, 10 feet in total diameter, rotated by means of an annular pipe 26 inches in external and 13 inches in internal diameter, bolted together in 8-foot lengths, driven by a small steam-engine fixed to a gear-box bolted to the caisson. Over the side of the caisson was a syphon, one leg running down the 13-inch pipe, the other into the river. Water was pumped into the dredging-chambers by two 13-inch centrifugal pumps. When working, the water due to the head maintained by these pumps flowed up the rotating shaft through the syphon into the river, carrying with it the mud, &c., cut away by the boring-head. Caisson No. 2, commenced in December 1897, was founded in August 1898; No. 3, started October 1898, was founded in August 1899; and No. 4, started December 1898, was founded in January 1900. Caisson No. 4 gave considerable trouble in sinking when only a few feet into the river-bed, and after it had been built up to a height of 40 feet, it one day suddenly tilted over until it was 5 feet 6 inches out of plumb. It was eventually straightened, but finally was founded about 2 feet to the west of its proper position. None of the other caissons were more than 9 inches out in any direction. The tops of the caissons were taken down to low-water level.

The girders were of a semi-bowstring type, each span weighing 546 tons. They were erected on two pontoons of steel, 280 feet by 40 feet by 10 feet. These were built in Calcutta, and designed so that they might afterwards be used for the waggon ferry over the Hugli in Calcutta. Each span was erected complete on the decks of the pontoons and then floated over the piers at high water, the piers having previously been built only to a height of 18 feet above low water. As the tide fell the pontoons floated away and left the span supported on packings. The remaining 15 feet in height of the piers had been built as the spans were lifted. The lifting was effected with 150-ton hydraulic jacks. To obtain as much room as possible the spans were placed alternately on the sites of the up and down roads, and when at the full height, those on

the site of the down roads were traversed over into line with the others. All the bricks and lime used on the works were burnt at the bridge site. The total weight on the base of each pier was 8697.5 tons, or 6.7 tons per square foot.

The actual construction was commenced in August 1897, and the bridge was tested and passed by the Government inspector on May 1, 1900.

### THE AUCTIONEERS' INSTITUTE.

A MEETING of the Auctioneers' Institute of the United Kingdom was held on the 17th inst. at the Medical Examination Hall, Victoria Embankment, when Mr. Walter D. Hollis read a paper on "The Professional Witness." The chair was taken by the president of the Institute, Mr. John Hepper.

Mr. Hollis gave definitions of the professional (or expert) witnesses from Best's "Law of Evidence," and from a work on evidence by Jeremy Bentham, and said he proposed to treat only of the witness whose special knowledge and experience were indicated by the terms surveyor and valuer. This witness probably first came into being at the commencement of railway development, became a distinct figure in the Courts after the passing of the first Stockton and Darlington Railway Act in 1821, and attained a vigorous manhood between the years 1821 and 1856, when nearly three hundred and nine millions of money was raised and expended in railway development in Great Britain. During this period numerous Acts were passed, culminating in the well-known Lands Clauses Act of 1845. Other great projects and Government schemes had since increased the necessity for expert evidence. Parliament stipulates that power to secure lands must have no appearance of confiscation. The principle was equitable, and the landowner not infrequently profited considerably. In all these cases the professional or expert witness formed part of a group representing Justice—though he must philosophically resign himself to be included amongst those not understood by the man in the street. The ordinary citizen could not be expected to understand an arbitration case, nor the reasons for divergent opinions of opposing professional witnesses. Notwithstanding this and even the stern rebukes as to expert evidence which had fallen from the Bench, he hoped the day was far distant when their standard of honour and integrity would be lowered. Surveyors and valuers

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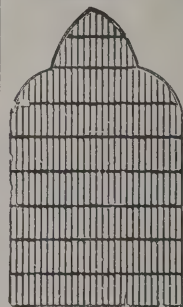
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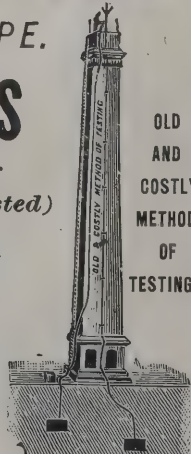
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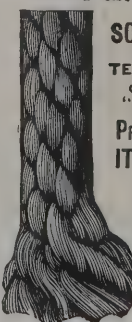
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had great responsibilities, necessitating in their discharge integrity and honour, as well as wide and varied knowledge. The cases taken before the umpire were the exception, the vast majority being settled amicably without reference; while of those referred, the greater number present difficulties giving scope for a wide divergence of opinion amongst the most experienced of men as to the method or theory which should be adopted in fixing values. The professional career of the valuer was one long lesson in bias. He was trained to it from the first—bias in favour of his clients. Naturally, therefore, in considering a case and preparing his evidence, he concentrated his mind upon his client's interests, and all his ideas and desires for the time being proceeded in that direction. But, granting to the witness a wide margin for natural and possibly unconscious bias, and allowing him fair scope for the selection of principles favourable to his client's case upon which to base his figures, he must not forget old Jeremy Bentham's quaint definition, "A sort of assistants to the Judge," and that, in addition to his client, he owed a duty to the tribunal before which he appeared, and what was more, he owed a duty to himself. Self-respect must come first. Fees were not only useful but indispensable, but the most liberal fees gave little satisfaction unless received under a sense, not only of service ably rendered, but of duties to their clients, their profession, and themselves honourably discharged.

In the discussion that followed, the Chairman emphasised the advantage of the expert witness, as, in advising his client, he frequently prevented the case from going to the Arbitration Court. Mr. Arthur Butler commented on the fact that bias was frequently caused by hostility to the opposing witness. Mr. Boyton, of London, and Mr. J. E. Gunn, of Cardiff, also spoke.

#### THE CAMPANILE OF ST. MARK'S AT VENICE.

THE following "authentic account of the circumstances that led to its fall" is contributed by Signor Pietro Saccardo, formerly architect-in-charge of the Basilica of St. Mark's, to the *Architectural Record* of New York:—

The construction of the Campanile of St. Mark's at Venice, which was built between the tenth and twelfth centuries, was influenced by the crude methods of that period. The walls were composed of large bricks of unequal size, which were obtained by the destruction of ancient monuments. The visible

surfaces of the walls were composed of bricks which were laid in fairly regular fashion; but, in the interior of the walls, the bricks were placed irregularly and bound with inferior mortar.

This fact was established by the downfall in which the edifice subsided into a mound of small fragments, from which rose a gigantic cloud of dust.

The tower had undergone repairs on several occasions in the course of centuries, but these for the most part had been limited to the bell-room, whose final form was of the style of the Renaissance. According to the information obtained from chronicles, it appears that the body of the tower never had had more than partial repairs before the eighteenth century. It had, however, been stuccoed in colour, in imitation of brick, which covering was in recent years only visible in spots.

It was about the middle of the century in question, and exactly in 1745, that serious fissures had been caused by lightning on the side above the Loggetta of Sansovino, and that this side had to be repaired completely.

The work was carried out under the direction of the celebrated Bernadino Zendrini, the engineer of the Republic, and cost 6,800 ducats, a very considerable sum for those times. This restoration, it should be carefully noted, consisted of an exterior wall of brick masonry similar to that used in our own time, laid with a mortar of lime and pozzolana in such fashion that this side of the tower presented a very modern appearance. However, inasmuch as the bricks of the new exterior wall could not be fastened to the older ones of the inner (ancient) wall, large square blocks of stone were set in, to unite the two. The white exterior surfaces of these were visible, scattered over the surface of the wall and set in its angles.

This outer masonry had remained in good condition until 1898, and then only had need of some slight repairs in the upper portion, which were called for by unimportant fissures, which did not affect the general stability of the tower. Thus the Campanile of St. Mark's might have stood for many centuries if the hand of man had not intervened to cause its ruin.

In the month of last June the Ufficio Regionale for the preservation of the monuments in Venetian territory, which had charge of the repairs of the Loggetta, undertook to replace the lead covering of the roof of this little monument.\*

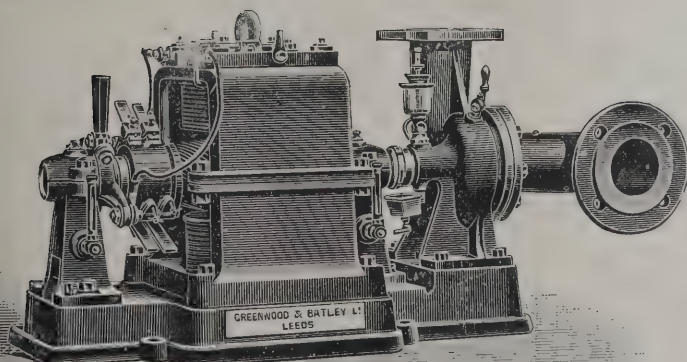
Since the Loggetta was built against the side of the tower, the roof leaned upon its wall, and at the line of union there

\* Under the direction of its associated architect, Signor Domenico Rupolo.

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was built into this wall a projecting and sloping coping, which kept the rain from entering the joint between the leaden covering and the surface of the wall.

Those who were directing this work, being under the necessity of renewing the leaden plates, had the unfortunate idea to remove the projecting coping, with the intention of replacing it immediately, and in order to do this they cut into the wall of the Campanile horizontally for more than two-thirds of its breadth. In this manner they seriously weakened the base of the outer wall, which had been built by Zendrini, as above explained. It must be remarked that at this height the outer wall was thinner than above, because a much more considerable thickness had been given to the outer wall above, that is to say, at the points where the lightning had caused the largest fissures in the old wall, whereas a thinner wall had served the purpose lower down. But this was also the portion subjected to the greatest strain, as having to support, to a large extent, the whole weight of the upper wall.

To give the last touch to this misfortune it happened that in cutting through the outer wall the inner one was injured at certain points, and this cutting caused the downfall of a considerable amount of *débris*, thus making a hollow space within, reaching upward, which could not be filled in.

In this fashion, either as a result of the horizontal cutting, which was left open for several days, or as a result of the cavity which had been caused in the interior of the wall, the outer wall of 1745 was thrown out of plumb and perceptible movements began to show themselves in the interior of the tower.

During this time the engineer, Saccardo, architect in charge of the Basilica of St. Mark's, was ill, and no one had mentioned to him that the work was going on. Notwithstanding this, as soon as the Ufficio Regionale invited him to visit the tower on Thursday, July 10, he did so, in spite of his illness, but he immediately perceived that any attempt at repair would be useless, and that the only thing that could be hoped for was that when the cutting had been filled in the outer wall might regain its stability.

It must, however, be remarked that although the architect of the Basilica had been advised of the cutting into of the exterior wall he had not been told of the interior cavity, so that his hopes were justified as far as his knowledge went.

It is also important to notice that up to the given date no obvious signs of danger had appeared in the exterior walls. It was not until Sunday, July 13, that fissures began to appear at

the north-east corner of the tower of such a menacing character that the architect, Saccardo, although still ill, was obliged to make immediate arrangements of thoroughgoing character for the public safety. In fact, on the following Monday at five minutes before ten o'clock in the morning the Campanile fell.

In the manner of this fall evidence was given that the immediate and only cause of the catastrophe was the cutting into the outer wall of 1745, and the damage caused in the ancient interior masonry by this cutting, for the collapse began with the total downfall of the aforesaid outer wall, which preceded by several seconds the complete ruin of the monument.

We may thank Providence that we have not had to lament the sacrifice of any human victim, and that the Basilica of St. Mark's, although only a few metres distant from the Campanile, was not injured at any point by its ruin. It must be added, however, that there was a victim, and this victim was Signor Pietro Saccardo, architect of the Basilica, who, having laboured in years past to repair the Campanile, had had the pain of seeing his undertaking interrupted by the plots of envious adversaries. On this last occasion he was removed from office with enormous injustice, even though temporarily, in spite of the patent evidence of his complete innocence and without regard to his age, to his forty years of service and to his infirm health, while the real culprit of the catastrophe still tranquilly retains his position. *Cherchez la femme—La Politique.*

An investigation is, however, pending, through which one may hope that justice will be done if there is still an atom of justice to be had in this world. And if against all evidence that justice should not be done, it is not only the architect, Saccardo, who will have been injured, but also his host of friends, who within a few months had presented him a gold medal for his services to the Basilica of St. Mark's.

#### FUTURE OF THE IRON TRADE.

A LECTURE was delivered at the Birmingham University by Mr. J. Stephen Jeans, secretary of the British Iron Trade Association. Mr. Jeans started with the assertion, says the *Birmingham Daily Post*, that the conditions on which the success and prosperity of the iron and steel industries, whether in this country or abroad, depended were the supply of raw materials at a low cost, the command of adequately skilled



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labour, free from liability to exactions and restraints likely to interfere with its maximum efficiency, a temperate climate, a geographical position which facilitated easy and inexpensive access to the world's markets, good administration, economical transport and fiscal systems that tended to promote expansion. The iron industry of the British Isles held for many years an almost unchallenged position in regard to most of these conditions. But from 1870 other nations had rapidly come to the front. Since 1890 our American cousins had made most of the running, until they now produced nearly one-half of both the iron and the steel manufactures throughout the world, occupying in this regard the same relative position, but on a greatly extended scale of operations, that England did in the middle of the nineteenth century. France now produced only one-third of the annual output of iron by Germany and Great Britain respectively. Austria-Hungary and Russia, which came much later into the field on anything like an extensive scale, were somewhat behind France in their annual yield. Belgium only produced one-half of the quantity of iron produced by France, and less than one-seventh of our own annual production, while Sweden produced little more than one-half the annual output of Belgium. Concerning the supplies of raw material, he remarked that it might be some satisfaction to reflect that while our supplies were probably nearer exhaustion than those of our greatest rivals, those rivals would, within the next half-century, at the present rate of exhaustion, have probably more reason to be alarmed for their future than our own country had to-day. It was certain that no country could now be said to have supplies that were correctly described as inexhaustible. That word was much more fitly applied to many stores of iron ore when the world's production of pig-iron was under six or ten millions a year—as it was in the earlier half of the nineteenth century—but now that the world's output of iron had risen to considerably over 40 million tons, involving the consumption of probably 130 to 140 million tons of ore, the word "exhaustion" had come to have a practical and an immediate import which it never had before. Even the vast deposits of Lake Superior might have their duration measured by the span of a single generation, or two generations at the most.

The future of the British iron industry would greatly depend on the extent to which it could command cheap and abundant raw materials in the form of ores and fuel. It was apprehended by some authorities that our outlook was far from satisfactory in respect of both. Not that the supply was exhausted, but

that its extent was uncertain and its quality tending to inferiority. The ores of the West coast occurred in veins or pockets, which had a habit of suddenly giving out when least expected. Some of the largest deposits in West Cumberland had been practically exhausted. Others promised to yield a large output for many years to come. Of such were the famous Hodbarrow mines, which had produced for many years an average of 350,000 to 400,000 tons annually, and on which an expenditure of 300,000*l.* or more was now being undertaken with a view to mining under the estuary of the Duddon. It was understood, by the way, that this company had for many years past paid from 30,000*l.* to 40,000*l.* a year in royalty rents to the Earl of Lonsdale, and parenthetically it might be added that the company had earned profits sufficient to pay an average dividend over the whole period of 40 per cent. to 50 per cent. On the West coast explorations were continually being carried on for the purpose of discovering new supplies of ore, but with only a limited amount of success. No one knew, and hardly anyone ventured even a conjecture, as to the quantity of hematite ores still unworked on the West coast. The assumption that there might be as much ore left as had hitherto been worked was a purely conjectural one, and had no really sound foundation. It was not entirely reassuring to find that most of the leading companies in this district—the Barrow, Millon & Askham, Cammell's and others—had taken steps to largely supplement their home sources of supply by imports of foreign ores, and that the total quantity of foreign ores brought into the district now approached one-half of the total consumption, whereas twelve years ago it was not 20 per cent. of the total, and twenty years ago it was practically nil. So far as the Cleveland district and other districts furnishing lias or kindred ores were concerned there was a vast reserve still available, although the grade had for a number of years past been declining and was likely to continue to do so.

The problem of the future, therefore, would be at what cost could low-grade ores be worked at a profit in competition with other ores, and on that question no adequate reply was at present possible. If he were asked for an opinion as to the district which had the most promise for the future, he would hardly name that in which they were met. All other things being equal, the manufacturing district that lay near to the sea and close to important coalfields had the greatest opportunity of doing an important business. Cleveland, South Wales and Scotland had these advantages, but in this unfortunate district railway charges went far to kill the iron industry. Up to fifty

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years ago the only iron of commerce was finished iron. It had long been prophesied that the finished iron industry was destined to be extinguished, but general prophecies of that kind were not entitled to much consideration. Still there had been a great decrease. He recollected that within the last year or two South Staffordshire works had been sold for little more than scrap value. Not much progress could be expected from an industry which showed such signs. Indeed, it was an indication of conservative ideas that that branch had held its own so well. When they remembered that a ton of bar iron cost three or four times the labour to produce that was expended on a ton of bar steel, and that when the iron was produced it was fibrous and heterogeneous, having its strength solely in one direction, while steel was a crystalline product having its strength in all directions, it did seem remarkable that steel had not displaced iron many years ago. That it was so was evidence that there was still a market, and he was happy to believe no inconsiderable market, for the products of South Staffordshire.

Mr. E. Parkes, M.P., remarked that one portion of the paper had not given much consolation to South Staffordshire. There was no doubt that geographically speaking they were in an awkward position, but they must remember that there was a home trade as well as a foreign trade. They must remember that steel as a merchantable article, he did not mean the old-fashioned high-priced kind, was to a certain extent on its trial. At the present time he did not think they had had sufficient experience of the lasting properties of steel to know whether it was useful for all the purposes to which at the present time it was put. While he was in America a gentleman engaged in perfecting a mechanical process of puddling told him that he had been doing so because he recognised that there were many purposes for which iron was more suitable than steel. He thought it was to be seen whether it was more suitable as some people held. He took it that that was one of the reasons why Staffordshire held her present position. If iron was somewhat out of place, how was it that the Germans were sending in a large quantity to this district? It was, to his mind, a standing reproach to them that they were not able to cut out this foreign iron. At any rate, it showed that there was a demand for such iron, and he hoped that Staffordshire would soon be again in a position to fully supply that demand. They knew that at the present time a British labour commission had gone to America, and perhaps they had seen the remark that now the representatives of labour had

been over the "bosses" ought to go. He believed that was perfectly true. It would be a good thing for the "bosses" to go to America in greater numbers than they did. When he came back from his own visit he was faced with this difficulty. His first idea was that he would like to scrap the whole of his plant, but there was this to be considered, that in America, and indeed in any protected State, they were much better able to do that. Protection suited them, and they made enormous profits, varying from 3% to 6% per ton on the materials sold at home; and that was the reason why they were able to scrap their modern machinery in a way that it would be impossible for manufacturers to do in this country. It must be remembered that Protection was a thing which gave Germany and America their power over us. They made up by their higher prices obtained for home consumption for the loss made on foreign sales. He did not think the age of private enterprise in the iron trade had ceased. Mr. Jeans had not told them whether he thought trusts were the solution of the difficulties of the British manufacturers. But he (the speaker) thought it must be remembered the trade of this country had been built up by private enterprise, and also that the trusts in America and in this country had private enterprise to compete with, and he was very much mistaken if they would not find that private enterprise would probably win in the long run. They must not be too nervous about these enormous trusts. Even if it had not come yet, they would have their testing day. On the whole, while they made one thoroughly roused, at the same time he thought they had some conditions of prosperity left in this country, and with a little more of the power of spending money, and with a little more enterprise and technical ability, which their rivals had to such an extent, they need not despair that they would have to relinquish their position to the foreigner.

Mr. Haswell expressed the hope that one influence of the faculty of commerce would be to drive away some of the fictions which the newspapers deftly wove into their articles dealing with trade subjects, and would cause the greater dissemination of hard facts. If it did, there would not be so much cause for extreme depression. He, for one, spoke for an enterprise that was not afraid of the future.

Alderman Clayton remarked that they seemed to be convinced of the necessity of higher education, and he hoped they would empower Mr. Parkes to point out from his place in Parliament that while the Government spent an enormous sum on elementary education, it did not do its duty to technical and higher education, as represented by the universities.

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